AALBORG UNIVERSITET

**Fakultetskontoret for
ENGINEERING, SUND og TECH**

Akademisk Råd indkaldes hermed til møde nr. 20172 onsdag den 17. maj 2017 kl. 12.30-16.00 NOVI, Niels Jernes Vej 10, mødelokale 1

Indkaldte:

Eskild Holm Nielsen, Petar Popovski, Knud Erik Skouby, Thomas Bak, Arne Remmen, Henrik Lund, Claus Lassen, Bent Thomsen, Ivan Aaen, Stefania Serafin, Mads Græsbøll Christensen, Morten Meyer Rasmussen, Lukas Bjørn Leer Bysted, Kristoffer Holger Weithøft Lindstrøm, Jacob Kjærsgaard, Torben Larsen, Kirsten Nielsen, Tine Lykke Tindal Sørensen

Afbud:

Referent: Rikke Poulsen

Gæster: Lars Hvilsted Rasmussen og Stine Thidemann Faber (pkt. 10), Betina Væversted og Kristian Vagn Nielsen (pkt. 11)

	Dagsordenpunkter
1.	**Godkendelse** A. Godkendelse af dagsorden for AR møde 20172 B. Godkendelse af referat af AR møde 20171 **Orientering** **Til efterretning** C. Referat fra ph.d.-udvalgsmøde 2-2017 den 25. april 2017 **Bilag 20172-1**
2.	**Valg af formand**
3.	**Tildeling af ph.d.-grad til positivt bedømte ph.d.-afhandlinger fra:** A. M.Sc. Brian Matthew Bemman, Institut for Arkitektur og Medieteknologi. Afhandlingens titel": Computational Problems in Modeling Milton Babbitt's Compositional Process". B. Cand.polyt. Dnyaneshwar Shriranglal Mantri, Institut for Elektroniske Systemer. Afhandlingens titel": Energy Efficient Bandwidth Management in Wireless Sensor Network". C. Cand.polyt. Fredrik Moltu Johnsen, Institut for Planlægning. Afhandlingens titel":

	The development of a weighting method for use in life cycle assessments of amine based post-combustion carbon capture and storage (CSS) in the Artic region". D. Cand.polyt. Gissel Velarde, Institut for Arkitektur og Medieteknologi. Afhandlingens titel": Convolutional methods for music analysis". E. Cand.mag. Karin Topsø Larsen, Institut for Planlægning. Afhandlingens titel": Laboured Learning – Investigating Challenged Localities Through a Geography of Vocational Education". F. M.Sc. Kjell Staffas, Institut for Planlægning. Afhandlingens titel": Developing Requisite Motivation in Engineering Studies. A study of a Master and Bachelor Program in Electronic Engineering at Uppsala University" G. Cand.polyt. Lucas Chavarría Giménez, Institut for Elektroniske Systemer. Afhandlingens titel": Mobility Management for Cellular Networks: From LTE Towards 5G". H. Cand.polyt. Neofytos Kaplanis, Institut for Elektroniske Systemer. Afhandlingens titel": Perception of Reverberation in Domestic and Automotive Environments". I. Cand.polyt. Rasmus Søgaard Lund, Institut for Planlægning. Afhandlingens titel": Heating strategies in a renewable energy transition". J. Cand.polyt. Tina Vestermann Olsen, Institut for Arkitektur og Medieteknologi. Afhandlingens titel": Timely Uses – a critical contribution to better practices of strategic and entrepreneurial temporary use". K. Cnad.scient. Zhengkui Zhang, Institut for Datalogi. Afhandlingens titel": Time and Cost Optimization of Cyber-Physical Systems by Distributed Reachability Analysis". **Bilag 20172-3**
4.	**Indstilling vedr. Adjungeret Professor/Adjungeret Lektor:** A. Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. tildeling af titlen adjungeret professor ved Institut for Elektroniske Systemer. B. Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. tildeling af titlen adjungeret lektor ved Institut for Arkitektur og Medieteknologi. **Bilag 20172-4**
5.	**Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. professorstillingen i:** A. "Computer Science" ved Institut for Datalogi (stilling 50119) **Bilag 20172-5**
6.	**Indstillinger vedr. sammensætning af sagkyndigt udvalg vedr. lektorstillingen i:** A. "Wireless Communication Systems and Networks" ved Institut for Elektroniske Systemer (stilling 42224) **Bilag 20172-6**
7.	**Indstillinger vedr. sammensætning af sagkyndigt udvalg vedr. adjunktstillingerne i:** A. "Cirkulær økonomi og ecodesign" ved Institut for Planlægning (stilling 201712) B. "Computer Vision and Computer Graphics" ved Institut for Arkitektur og Medieteknologi (stilling 201713) C. "Energy Planning" ved Institut for Planlægning (stilling 201714) **Bilag 20172-7**
8.	**Indstillinger vedr. sammensætning af sagkyndige udvalg vedr. postdoc-stillingerne i:** A. "Outcome Measures in adult hearing rehabilitation" ved Institut for Elektroniske Systemer (stilling P21709) B. "Alarm og pejlesystemer til personer med demens" ved Institut for Arkitektur og Medieteknologi (stilling P21714) **Bilag 20172-8**
9.	**Serviceeftersyn af universitets vedtægt**

	Akademisk råd bedes drøfte følgende: Er der kompetencer/opgaver vedr. akademisk råd i den gældende vedtægt, som ikke bør fremgår af vedtægten, og hvorfor? Er der kompetencer/opgaver vedr. akademisk råd, som ikke fremgår af den gældende vedtægt, men som bør fremgå, og hvorfor? **Bilag 20172-9**
10.	**Præsentation af ligestillingsudvalget** v. SUND Dekan Lars Hvilsted Rasmussen og Stine Thidemann Faber, Lektor, Institut for kultur og globale studier og Videncenter for Køn, Ligestilling og Diversitet Debat og input fra AR til handleplan for ligestilling og diversitet. (Punktet behandles uanset rækkefølge kl. 14.00-14.30) **Bilag 20172-10**
11.	**Økonomi** – ny budgetmodel, v/Kristian Vagn Nielsen og Betina Væversted, økonomi Introduktion og indledende drøftelser vedr. hovedprincipper til ny budgetmodel.
12.	**Meddelelser fra dekanen**
13.	**Eventuelt**

Til orientering
- Fortegnelse over sager godkendt af dekanen siden sidst

OBS! Vedr. bedømmelsesudvalg: I de tilfælde hvor ansøgningsfristen ligger efter Akademisk Råds møde kontrolleres der efterfølgende for inhabilitet og sammensætning af udvalget (kvindelig bedømmer). Hvis der konstateres uregelmæssigheder, vil dekanen/formanden godkende nyt/nye medlemmer.

REFERAT Akademisk Råd, møde nr. 20171 onsdag den 29. marts 2017, kl. 12.30-16.00

Deltagere:
Eskild Holm Nielsen, Petar Popovski, Knud Erik Skouby, Thomas Bak, Henrik Lund, Bent Thomsen, Ivan Aaen, Stefania Serafin, Mads Græsbøll Christensen, Morten Meyer Rasmussen, Lukas Bjørn Leer Bysted, Kristoffer Holger Weithøft Lindstrøm, Jacob Kjærsgaard, Torben Larsen, Kirsten Nielsen, Tine Lykke Tindal Sørensen,

Afbud:
Knud Erik Skouby, Arne Remmen, Claus Lassen.

Referent:
Rikke Poulsen

Gæster:
Anne Christoffersen – HR kontoret (pkt. 1.b), Nickie Kate Hermansen – HR kontoret (pkt. 9), Betina Væversted – Økonomi (pkt. 10)

	Dagsordenpunkter
1.	**Velkomst** v. Eskild Holm Nielsen A. Præsentation af deltagerne B. Intro til Akademisk Råd v. Anne Christoffersen, HR-kontoret
Referat	Der blev stillet spørgsmål til, hvorfor tildelingen af phd-grader ligger ved AR, da dette ikke er tilfældet på DTU og AU. Anne Christoffersen og Rikke Poulsen følger op på, hvorvidt der er mulighed for at ændre dette i forhold til det juridiske, da det er givet i forhold til universitetsloven og vedtægterne.
2.	**Konstituering med valg af formand** **Bilag 20171-2**
Referat	Det konkluderes, at EHN foreløbigt konstitueres som formand frem til næste møde, hvor der på ny tages stilling til konstitueringen.
3.	**Godkendelse** A. Godkendelse af dagsorden for AR møde 20171 B. Mødekalender 2017 **Orientering** C. Tidsplan for skriftlige høringer 2017 D. Standardforretningsorden E. Vejledning til bedømmelsesudvalg

	F. Sammensætning af bedømmelsesudvalg
	Til efterretning
	G. Referat fra ph.d.-udvalgsmøde 7-2016 den 3. oktober 2016
	H. Referat fra ph.d.-udvalgsmøde 8-2016 den 16. november 2016
	I. Referat fra ph.d.-udvalgsmøde 9-2016 den 7. december 2016
	J. Referat fra ekstra ph.d.-udvalgsmøde den 14. februar 2017
	Bilag 20171-3
Referat	Dagsorden og mødeplan godkendt.
	G-J taget til efterretning.
4.	**Tildeling af ph.d.-grad til positivt bedømte ph.d.-afhandlinger fra:**
	A. Cand.polyt. Anja Marie Bundgaard, Institut for Planlægning. Afhandlingens titel: "Ecodesign for a circular economy. Regulating and Designing Electrical and Electronic Equipment".
	B. Cand.polyt. Burak Cakmak, Institut for Elektroniske Systemer. Afhandlingens titel: "Random Matrices for Information Processing – A Democratic Vision".
	C. Cand.polyt. Christer Peter Volk, Institut for Elektroniske Systemer. Afhandlingens titel: "Prediction of Perceptual Audio Reproduction Characteristics".
	D. Cand.polyt. Emil Feldborg Buskgaard, Institut for Elektroniske Systemer. Afhandlingens titel: "The Dynamics of the User Effect on Electrically Small Antennas".
	E. Cand.polyt. Jovan Varga, Institut for Datalogi. Afhandlingens titel: "Semantic Metadata for Supporting Exploratory OLAP".
	F. Cand.polyt. Madhukar Deshmukh, Institut for Elektroniske Systemer. Afhandlingens titel: "Spectrum Sensing Strategies in Cognitive Radio Networks".
	G. MSc Business Administration Mushtaque Ali Jariko, Institut for Planlægning. Afhandlingens titel: "Perception and Posibilities of Corporate Social Responsibility (CSR) in a Public Company of Pakistan, a casestudy of Paktistan State Oil (PSO)".
	H. MSc Business Administration Roslyn Layton, Institut for Elektroniske Systemer. Afhandlingens titel: "Which Open Internet Framework is Best for Mobile App Innovation? An Empirical Inquiry of Net Neutrality Rules Around the World".
	Bilag 20171-4
Referat	Alle indstillinger godkendes.
	Vedr. H bemærkes det, at personen fremover får en meget synlig stilling, hvorfor det er særlig vigtigt, at alt er foregået korrekt. Det ses ikke at være uregelmæssigheder i processen.
5.	**Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. professorstillingen i:**
	A. "Machine Learning and Speech Processing" ved Institut for Elektroniske Systemer (60118)
	Bilag 20171-5
Referat	Udvalget godkendt.
6.	**Indstillinger vedr. sammensætning af sagkyndige udvalg vedr. lektor stillingerne i:**
	A. "Marine Governance and Coastal Community Development" ved Institut for Planlægning (42215)
	B. "Land Management" ved Institut for Planlægning (42216/201705)
	Bilag 20171-6
Referat	Begge udvalg godkendt.
7.	**Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. adjunktstillingen i:**
	A. "Energy Planning" ved Institut for Planlægning (201706)

	Bilag 20171-7
Referat	Udvalget godkendt.
8.	**Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. postdoc-stillingen i:** A. "Statistics and Spatial Analysis of weather impacts on local fluctuations in e.g. wind and demands data and distribution data for energy system analyses" ved Institut for Planlægning (P21706) **Bilag 20171-8**
Referat	Udvalget godkendt.
9.	**Shortlisting i forbindelse med bedømmelsesproces** **Bilag 20171-9**
Referat	Der er enighed om, at det er et meget positivt tiltag og det godkendes, at HR forsætter med implementeringen.
10.	**Tema: Intro til økonomi – årsresultat 2016 v. Betina Væversted, Økonomi** Introduktion til økonomi for AR-medlemmer samt orientering om årsresultat 2016. **Bilag 20171-10**
Referat	Den fremlagte præsentation sendes ud sammen med referatet. Link til budget og fokuspunkter 2017: http://www.e-pages.dk/aalborguniversitet/505/
11.	**Meddelelser fra dekanen** Formning af TECH fakultetet - Tech ledelsen er på plads: o Dekan Eskild Holm Nilesen o Prodekan for Forskning Torben Larsen o Prodekan for Uddannelse Jakob Stoustrup - Involverede proces med TECH ansatte o Kick off med deltagelse af ca. 200 VIP ansatte – præsentation af foreløbige tanker om strategien. o Workshop med 70 VIP deltagere. Mange gode forslag til indsatser inden for strategien. - Kommunikationsstrategi for TECH o Nødvendigt for at vi sikrer god branding af TECH. - Ny budgetmodel o Arbejdet er igangsat og det vil blive fremlagt for AR. o Det overvejes at oprette et ekstra møde i AR alene vedr. budgetmodellen. Ny organisationsmodel for skoleområdet på TECH og ENGINEERING - Processen er i gang. Der er udsendt særskilt information herom på mail bl.a. til berørte medarbejdere og til institutledere. - Den strategiske udvikling og kvalitetssikringen kører i regi af fakultetet men det uddannelsesnære skal forsat køre tæt på de studerende. Status arbejdsmiljø KBH - Vi har arbejdet med at få organiseringen af TECH ledelsen endeligt på plads således at flere medarbejdere i KBH har en direkte leder i Sydhavnen. - Derudover viste undersøgelsen de generelt kendte problemer i universitetssektoren – "det grænseløse arbejde", der ofte relaterer sig til en opfattelse af situationen. Call vedr. postdocs

	- Fakultetet har lavet et call vedrørende internationale postdocs. Der er frist den 21. april. - De internationale postdocs skal bl.a. hjælpe til med at styrke vores position i forbindelse med særlig international funding. o Emnet blev diskuteret, hvor det bl.a. blev tilkendegivet, at det er vigtigt at fakultetet sætter fokus på at pengene reelt går til internationale postdocs, og at det er vigtigt at tiltrække fra udlandet, for at undgå for meget "indavl". Samtidig blev der stillet spørgsmålstegn ved om der var et problem med at tiltrække internationale postdocs, da det ikke opleves sådan alle steder. Der var enighed om at det efterfølgende skal evalueres, om indsatsen har haft den ønskede effekt.	
12.	**Temaer** Drøftelse af temaer til kommende AR-møder i 2017.	
Referat	Økonomi. Kvalitetssikring der gavner. Tværfaglig uddannelse institutterne imellem. Uddannelsesporteføljen. AR's mulige rolle som aktiv spiller ved udvikling af fakultets politik.	
13.	**Eventuelt**	
Referat	Claus Lassen foreslår at der nedsættes et udvalg vedr. adjungeringer der kan nedskrive nogle guidelines som præsenteres for AR. Ivan vi deltage og Eskild spørger Henrik Lund og Ole B. Jensen. Anne Christoffersen vil gerne understøtte arbejdet fra HR. Tværfakultære projekter: Der kommer snart invitationer ud til de 5 workshops. Det er vigtigt, at man opfordrer og opmuntrer kolleger til også at melde ind på de temaer som de øvrige fakulteter står i spidsen for. Der er tale om prestigeprojekter under Viden for Verden, og det vil være dårligt signal hvis der ikke er TECH folk med i andre projekter end vores eget.	

Til stede:
Christian S. Jensen (CSJ)
Lars Bo Henriksen (LBH)
Rafael Wisniewski (RAF)
Peter Axel Nielsen (PAN)
Mads Græsbøl Christensen (MGC)
Michael Kvist Svangren (MKS)
Anne Juhler Hansen (AJH)
Charlotte Holmberg (CHO)
Maria Bredvig (ref.) (MAB)

Referat af ph.d.-udvalgsmøde 2-2017 tirsdag den 25. april 2017

1.   Godkendelse af dagsorden
Dagsordenen blev godkendt.

2.   Nedsættelse af bedømmelsesudvalg

a) Vedr. cand.polyt. Louise Brønnums ph.d.-afhandling: "Strategic Enactement of Front and Innovation: a Case Study of Multiple Enabling Opportunities", Institut for Planlægning.
Ph.d.-udvalget godkendte bedømmelsesudvalget.

b) Vedr. cand.scient.adm. Sara Bjørn Aaens ph.d.-afhandling: "Understanding Citizen Action in Public Participation Processes", Institut for Planlægning.
Ph.d.-udvalget godkendte bedømmelsesudvalget.

c) Vedr. cand.scient. Maria Simonsens ph.d.-afhandling: "Stochastic Switching Dynamics", Institut for Elektroniske Systemer".
Instituttet har oplyst, at begge eksterne bedømmere har trukket sig fra bedømmelsesudvalget.

3.   Meddelelser
PAN foreslog, at de ph.d.-studerende inviteres til mødet den 23.05.17 med henblik på planlægning af de generelle ph.d.-kurser i 2018. MAB inviterer de ph.d.-studerende.

4.   Eventuelt
Intet at berette.

Det Tekniske Fakultet for IT og Design
Niels Jernes Vej 10
Att.: Helene Ulrich Pedersen

Brian Matthew Bemman – Computational Problems in Modeling Milton Babbitt's Compositional Process

Hermed fremsendes bedømmelsesudvalgets indstilling vedr. Brian Matthew Bemmans ph.d. afhandling, som han forsvarede onsdag den 3. maj 2017. Af indstillingen fremgår, at bedømmelsesudvalget anbefaler, at Brian Matthew Bemman bliver tildelt ph.d.-graden.

Instituttet indstiller, at Brian Matthew Bemman bliver tildelt ph.d. graden.

Med venlig hilsen

Lisbeth Dam

Bilag

Assessment of the PhD thesis entitled *Computational Problems in Modeling Milton Babbitt's Compositional Process*

Submitted by Brian Bemman, M.Sc. in Computer Science and Engineering

The assessment committee consists of the following members as decided by the Dean of the Technical Faculty of IT and Design by 16/03/2017:

- Member 1: CNRS Director of Research, Moreno ANDREATTA, CNRS-IRCAM-UPMC (Paris, France) Moreno.Andreatta@ircam.fr
- Member 2: Professor Andrew Mead, Jacobs School of Music, Indiana University (Bloomington, IN, USA) awmead@indiana.edu
- Member 3: Associate Professor Amalia de Götzen, Aalborg University in Copenhagen (Copenhagen Denmark), ago@create.aau.dk

Supervisor for the thesis has been Assoc. Prof. David Meredith, Aalborg University

Description of the thesis
The thesis is based on an extended Summary followed by a collection of six papers, two of them being currently under reviewing:

- Paper 1: Exact Cover Problem in Milton Babbitt's All-partition Array, Bemman, B. and Meredith, D., Mathematics and Computation in Music, 2015, printed.

- Paper 2: Predicting Babbitt's Time points in None but the Lonely Flute and Around the Horn, Bemman, B. and Meredith, D., Journal of Mathematics and Music, submitted. ☐

- Paper 3: Generating Milton Babbitt's All-partition arrays, Bemman, B. and Meredith, D., Journal of New Music Research, 2016, printed. ☐

- Paper 4: Integer Programming Fomulation of the Problem of Generating Milton Babbitt's All-partition arrays, Tanaka, T., Bemman, B. and Meredith, D., International Society for Music Information Retrieval, 2016, printed. ☐

- Paper 5: Constraint Programming Approach to the Problem of Generating Milton Babbitt's All-partition array, Tanaka, T., Bemman, B. and Meredith, D., International Conference on Principles and Practice of Constraint Programming, 2016, printed.

- Paper 6: Generating new musical works in the style of Milton Babbitt, Bemman, B. and Meredith, D., Computer Music Journal, submitted.

Assessment of the thesis
The thesis consists of a series of papers dealing with mathematical modeling of certain aspects of Milton Babbitt's compositions. Its greatest contribution is in providing a set of mathematical tools for constructing and

analyzing all-partition arrays, and exploring the range of possibilities each aggregate in such an array provides for realization. It offers as illustration some analyses of works of Babbitt, as well as a demonstration of concept in the form of an originally generated piece of music in "the style of Babbitt", providing an excellent contribution in the field of computational musicology and algorithmic composition. All the published papers are high quality research papers that went through a rigorous - sometimes double-blind - peer reviewing process.

Paper 1 This first conference paper provides the link between the compositional problem of describing an all-partition array and well-known computational problems in computer science (i.e. the *exact covering problem*) which are approached and solved via a backtracking algorithm. This computational study offers new original solutions of Babbitt's all-partition array problem that differ from the existing ones in the literature. This fact is not surprising as such, since Babbitt's music has mostly been approached by theoretical studies rarely dealing explicitly by computational models. It also shows the richness of the concepts introduced by the American composer in his mathematization of the serial techniques.

Paper 2 This second journal paper deals with the problem of determining the exact number of possible time-point rows from the ordered mosaics in an all-partition array. A model is proposed based on a combination of two existing approaches (Rothgeb's *order inversions* measure and Povel and Essens' *clock induction* model) and is applied to the analysis of Babbitt's pieces *None but the Lonely Flute* and *Around the Horn*. The paper clearly shows the necessity of adapting and refining previous theoretical measures in order to capture, in a more flexible way, the singularity of Babbitt's compositional strategies.

Paper 3 This third journal paper shows the difficulty of correctly formalizing and generating special types of all-partition arrays called "Smalley" arrays that one find in pieces including *The Joy of more Sextets*, the *Piano Concerto* and *About Time*. As observed by the candidate, although the approach described in this paper did not initially provide the expected results, by adding some further constraints one may reduce the combinatorial explosion and crucially refine the search space. This refinement offers new perspectives in the computational analysis of Babbitt's music based on this very strict combinatorial technique.

Paper 4 This conference paper provides a new theoretical and computational approach to the problem of generating a complete six-part all-partition array starting from a given array of 12-tone rows. From a theoretical point of view, the problem is approach via the more general mathematical concept of *covering* (instead of the usual partitioning one) whereas an integer programming (IP) model is proposed to approach this topic computationally. Unfortunately, stating a partition problem as a covering one and trying to solve it via an integer programming technique does not provide the right strategy to approach this problem.

Paper 5 This conference paper shows how to approach the all-partition array problem with the constraint programming (CP) paradigm in computer science. Taking profit of the negative conclusions of paper 4, the article only focus in four-part all-partition arrays. A new solution, different from Babbitt's solutions, is obtained following this approach, which opens new interesting perspectives in the study of all-partition arrays of larger cardinalities.

The papers are introduced by an extended summary which provides an excellent and very detailed state of the art of the subject. After providing an introduction to computational music analysis and generation (with a

critical evaluation of existing computational models in the field of tonal, post-tonal and twelve-tone music analysis and generation), also including a discussion on the perceptual and cognitive aspects of computational musicology, the extended summary focuses principally on Milton Babbitt's compositional processes and previous attempts in providing computational models of the composer's strategies. Interestingly, very few computational models exist that tried to approach the combinatorial properties of Babbitt's compositional methods within the field of computer science and engineering. This thesis is surely one of the most accurate studies of the computational concepts underlying Babbitt's music, focusing on two theoretical constructions that are deeply interrelated in the composer's universe, i.e. the all-partition array and the time-point system. In addition to the poietic character of the candidate's approach, based on Babbitt's compositional constructions described by the author in his theoretical writings, the originality of this dissertation relies in the algorithmic procedures that have been conceived by the candidate in order to shed some light on the combinatorial and computational component of Babbitt's twelve-tone techniques. Original computational models are therefore proposed and critically evaluated by the candidate in order to grasp these combinatorial aspects from a computational perspective. These models are rooted in the candidate's computer science knowledges and not only evaluated from an analytical perspective but also applied in the field of algorithmic composition, which constitutes a very original contribution in the field of computational musicology, especially with respect to Milton Babbitt's music. As a result, the thesis contains very interesting new results, as it is shown by the number of published papers and articles under reviewing in high level international peer reviewing conference proceedings and journals. The reader can systematically follow the link between the general research context provided by the candidate in his extended summary and the content of the articles which are also very well summarized in the final part of the introduction. The document is written in a very accurate way and is accompanied by a rich bibliographical section showing the wide spectrum of the topics and ideas that the candidate had to digest during his doctoral studies. If there is no doubt on the relevance and impact of the results in the field of computer science and engineering, it would have been interesting to confront these computational approaches with more formal and mathematical formalizations, eventually leading to more structural results, particularly from an algebraic perspective. Both all-partition arrays and time-point systems are in fact deeply rooted into an algebraic framework, as several mathematical music theorists have pointed out since the 1990 (see, in particular, Harald Fripertinger's classification techniques of partitions and mosaics based on Polya Enumeration Theory). In general, this study could have taken a great benefit on music-theoretical and analytical studies based on a more advanced mathematical formalization based on group factorizations. Once implemented into computer-aided compositional environments, such as OpenMusic visual programming language, these tools provide complementary algorithmic strategies to those described in the dissertation and a starting point for more structural generation processes. Some of the candidate's papers go in this direction. As an example, one can consider the fourth paper proposing to approach Babbitt's problems via the more general mathematical concept of covering (instead of the usual partitioning one). Despite the difficulties in stating a partition problem as a covering one and trying to solve it via an integer programming technique, as we have observed previously, this does not imply that the approach is uninteresting, since negative results can offer new perspectives in future research. Similar attempts have been made, for example, in an apparently very different topic such as the construction of tiling rhythmic canons. In this case, the tiling property (corresponding to a special case of Babbitt's partition concept) has been replaced with the notion of multiple tiling (corresponding to the mathematical concept of covering), by suggesting new generalized computational models of these musical structures.

From a musical perspective, the thesis is hardly a comprehensive exploration of Babbitt's compositional method, nor does it undertake any investigation of how these practices might have been used to compound the kinds of chains of relationships and gradual accrual of associations that form the all-of-a-piece of music that each Babbitt work is. Further, it sets aside for the most part any consideration of the perceptual implications of Babbitt's choices. It is true, Babbitt used dynamic levels to project individual lines of his time-point arrays, but he also seemed compositionally very much aware of how different dynamic levels are indeed different. *fff* and *pp* are not merely different, but are qualitatively, experientially different, as are high and low in pitch range. Although one might think that instruments were only timbres in Babbitt's thinking, it could be claimed that the same sequence of pitches, dynamics and rhythms undertaken by a flute, a violin, or a piano will all exhibit different qualities of musical experience and work, and also that these differences are very much part of how we experience this music. Similarly, it can be suggested that the range of rhythmic practices found even in late Babbitt raise all sorts of questions that are not fully addressed in the thesis, although some nice observations about rhythm are made in Paper 2. But those claims best adhere to a subset of Babbitt's compositions, which represent the practice he is observing.

These remarks have to been taken as indications of possible additional strategies that can be used to go deeper into some mathematical and musical aspects of Babbitt's compositional techniques and do not reduce the high value of this thesis.

Conclusions

The oral defense was held on May 3, 2017 at Aalborg University, Aalborg, Denmark. The work was presented by the candidate in a very accurate and pedagogical way, his responses showed that his knowledge about Babbitt's music and compositional procedures go well beyond what is described in the dissertation and that he is very much aware of the significance of the issues raised in the preliminary assessment. His presentation at the defense was very clear and covered the high points of the dissertation: he was able to convey in a way accessible to wide range of listeners not only what he was doing but the significance of it by accompanying his oral presentation by well selected and pertinent musical examples. The committee therefore recommends that Mr. Brian Bemman is awarded the Ph.D. degree.

03/05/2017

Moreno Andreatta   Andrew Mead   Amalia de Götzen

Til Forskerskolen
Att.: Lisbeth Diinhoff
N.J. 10

Vedrørende tildeling af ph.d.-grad til Dnyaneshwar Shriranglal Mantri

Institut for Elektroniske Systemer indstiller at bedømmelsesudvalgets indstilling følges således at Dnyaneshwar Shriranglal Mantri tildeles ph.d.-graden for sin ph.d.-afhandling "Energy Efficient Bandwidth Management in Wireless Sensor Network". Forsvaret fandt sted d. 31.03.2017.

Professor Ramjee Prasad har været hovedvejleder for Dnyaneshwar Shriranglal Mantri.

Med venlig hilsen

Børge Lindberg

Institutleder

AALBORG UNIVERSITY
DENMARK

Assessment of the PhD thesis entitled:

ENERGY EFFICIENT BANDWIDTH MANAGEMENT IN WIRELESS SENSOR NETWORK

Submitted by DNYANESHWAR SHRIRANGLAL MANTRI, M.Sc. in Electronic Engineering

The assessment committee consists of the following members as decided by the Dean of the Faculty of Engineering and Science by Eskild Holm Nielsen 11-05-2016:

Associate Professor Reza Tadayoni (chairman)
Department of Electronic Systems
Aalborg University
E-mail: reza@cmi.aau.dk

Professor K.C. Chen
College of Electrical Engineering & Computer Science
National Taiwan University
Taiwan
University of South Florida
USA
E-mail: chenkc@ieee.org

Professor K.P.Subbalakshmi
Department of Electrical and Computer Engineering
Stevens Institute of Technology
USA
E-mail: ksubbala@stevens.edu

Supervisor and co-supervisor for the thesis has been

Supervisor: Professor, Ramjee Prasad, Department of Electronic Systems.

Co-supervisor: Professor Shingo Ohmori, CTIF Japan, Aalborg University

Description of the thesis
This thesis is a monograph titled 'Energy efficient bandwidth management in wireless sensor networks'. The thesis is of 130 pages divided in 6 chapters. Each chapter ends with a reference list. Furthermore, the thesis contains one appendix (appendix A) of two pages.

The dissertation studies energy efficient bandwidth management framework for WSNs. The main contribution focuses on data aggregation, scheduling, and synchronization mechanisms for effective

utilization of bandwidth in cluster-based static, mobile and heterogeneous WSNs. The dissertation is organized into six chapters. The organization of the dissertation is well laid out.

In the following short description of the six chapters and the appendix are given. Chapter 1 is the introduction, gives overview of background and motivation, a general literature review, and defines problem formulation both as a number of hypotheses and research questions. Furthermore chapter one contains the methodology of the research and the contributions of the thesis. The contributions of the thesis are divided into three main modules: Aggregation, scheduling and synchronization, which are discussed in detail in the following chapters. Chapter 2 is about Data Aggregation Algorithms for Bandwidth Management in Wireless Sensor Networks (WSN), chapter 3 is about Mobility and Heterogeneity-aware Data Aggregation Algorithms, chapter 4 is about Scheduling Algorithms for Efficient Bandwidth Utilization in WSN, chapter 5 is about Synchronized Algorithms for Bandwidth Utilization in WSN. Chapter 6 contains the conclusions of the research and the future outlook. Appendix A contains a table that outlines the relationship between different chapters and the publications.

The thesis has resulted in 5 journal papers and 12 conference papers. All the papers are co-authored with the supervisor and other colleges. The co-author statements are signed and delivered by the author and co-authors. In the following the list of papers are outlined with title, authors, name of journal/conference and status (the list is taken from the thesis page 18-20):

Journal Publications:

1. Dnyaneshwar Mantri, Neeli R Prasad, and Ramjee Prasad, "Two Tier Clusterbased Data Aggregation (TTCDA) in Wireless Sensor Network," Springer Journal Wireless Personal Communications, vol.75, Issue 4, pp. 2589-2606, November 2013.DOI 10.1007/s11277-013-1489-x.

2. Dnyaneshwar Mantri, Neeli R Prasad, Ramjee Prasad, "BECPA: Bandwidth Efficient Cluster-based Packet Aggregation in Wireless Sensor Network," Springer Journal, TTPBL special Issue of Wireless Personal Communication, vol.76, Issue 3, pp. 335-349, March 2014, DOI 10.1007/s11277-014-1709-z.

3. Dnyaneshwar Mantri, Neeli R Prasad, Ramjee Prasad, "Bandwidth Efficient Heterogeneity aware Cluster-based Data Aggregation for Wireless Sensor Network," Elsevier Journal of Computer and Electrical Engineering, vol 41, pp. 256–264, January 2015, DOI:10.1016/j.compeleceng. 2014.08.008.

4. Dnyaneshwar S. Mantri, Neeli Rashmi Prasad, and Ramjee Prasad, "Mobility and Heterogeneity-Aware Cluster-based Data Aggregation for Wireless Sensor Network," Springer Journal-Wireless Personal Communication, vol. 86, Issue 2, pp. 975-993, January 26, 2016, DOI:10.1007/s11277-015-2965-2.

S. Dnyaneshwar S. Mantri, Neeli Rashmi Prasad, and Ramjee Prasad, "Heterogeneity–aware Bandwidth Efficient Hybrid Synchronization for Wireless Sensor Network," 7th International Conference on Communication, Computing and Virtualization (ICCCV-16), Extended in International Journal of Computer Application (IJCA)- ISSN 0975–8887 (Accepted).

International conferences

1. Dnyaneshwar Mantri, Neeli R Prasad, Shingo Ohmori, and Ramjee Prasad, "Two-Tier Cluster-based Data Aggregation (TTDCA) for Wireless Sensor Networks," 6th IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS12), pp. 117-122, Dec 19-20, 2012, Bangalore, India.

2. Dnyaneshwar Mantri, Neeli R Prasad, and Ramjee Prasad, "Grouping of Clusters for Efficient Data Aggregation (GCEDA) in Wireless Sensor Network," 3rd IEEE International Advance Computing Conference (IACC- 2013), pp. 132-137, Feb. 22-23, 2013, Ghaziabad, India.

3. Dnyaneshwar Mantri, Neeli R Prasad, and Ramjee Prasad, "BECPA: Bandwidth Efficient Packet Aggregation for Wireless sensor network," 2nd International Conference on Mobility for life: Technology, Telecommunication & Problem-based Learning (TTPBL-2013), pp. 87-91, March 14-16, 2013, Nashik, India.

4. Dnyaneshwar Mantri, Neeli R Prasad, Ramjee Prasad, "MHBCDA: Mobility and Heterogeneity aware Bandwidth Efficient Cluster-based Data Aggregation for Wireless Sensor Network," Wireless Vitae 2013, pp. 1-5, June 22-24, 2013, Atlanta City, New Jersey, USA.

5. Dnyaneshwar Mantri, Neeli R Prasad, Ramjee Prasad, "BHCDA: Bandwidth Efficient Heterogeneity aware Cluster-based Data Aggregation for Wireless Sensor Network," 2nd International Conference on Advances in Computing, Communications and Informatics (ICACCI2013), pp. 1065-1069, August 22-25, 2013. Mysore, India.

6. Dnyaneshwar Mantri, Pranav Pawar, Neeli R Prasad, and Ramjee Prasad, "Cluster-based Myopic and Non-myopic Scheduling for Wireless Sensor ENERGY EFFICIENT BANDWIDTH MANAGEMENT IN WIRELESS SENSOR NETWORK," 2014 IEEE Students' Technology Symposium (TechSym), pp. 116,120, Feb. 28-March 2, 2014, IIT Kharagpur, India.

7. Dnyaneshwar Mantri, Pranav Pawar, Neeli R Prasad, and Ramjee Prasad, "An Efficient Schedule based Data Aggregation using Node Mobility for Wireless Sensor Network," Wireless Vitae 2014, pp. 1-5, May 1-14, 2014. Aalborg, Denmark.

8. Dnyaneshwar Mantri, Neeli R Prasad, and Ramjee Prasad, "Scheduled Collision Avoidance in Wireless Sensor Network using ZigBee," 3rd International Conference on Advances in Computing, Communications and Informatics (ICACCI2014), pp. 2129-2134, Sept. 25-27, 2014, Delhi, India.

9. Dnyaneshwar Mantri, Neeli R Prasad, and Ramjee Prasad, "Synchronized Data Aggregation for Wireless Sensor Network," 1st IEEE Global Conference on Wireless Computing and Networking, pp. 263-267, Dec. 22-24, 2014, SIT, Lonavala, India.

10. Dnyaneshwar S. Mantri, Neeli Rashmi Prasad, and Ramjee Prasad, "Bandwidth Efficient Hybrid Synchronization for Wireless Sensor Network," 4th International Conference on Advances in Computing, Communications and Informatics (ICACCI2014), pp. 2108-2113, August 10-13, 2014. Kochi, India.

11. Dnyaneshwar S. Mantri, Neeli Rashmi Prasad, and Ramjee Prasad, "Mobilityaware Hybrid Synchronization for Wireless Sensor Network," WPMC 2015, Hyderabad, India (Presented).

12. Dnyaneshwar S. Mantri, Neeli Rashmi Prasad, and Ramjee Prasad, "Node Heterogeneity for Energy Efficient Synchronization for Wireless Sensor Network," 7th International Conference on Communication, computing and Virtualization (ICCCV-16), in association with Elsevier B.V. Amsterdam, Procedia Computer Science vol 79, pp. 885-892, Feb. 26-27, 2016, Mumbai, India.

Assessment of the thesis

The dissertation studies energy efficient bandwidth management framework for WSNs. The main contribution deals with data aggregation, scheduling, and synchronization mechanisms for effective utilization of bandwidth in cluster-based static, mobile and heterogeneous WSNs. The manuscript to serve PhD dissertation aims at the development of state-of-the-art technology related to wireless sensor networks that play important role in Internet of Things (IoT). In particular, this dissertation focuses on spectrum and energy efficiency, the most wanted technology in the area. The major contributions lie in data aggregation, mobility, scheduling, and synchronization, which consist of integral investigations from different aspects.

The contributions are of outstanding quality and cover the three main areas of data aggregation, scheduling and synchronization:

- Regarding the data aggregation part, the thesis proposes new approach to select an appropriate algorithm, to incorporate energy model in data aggregation, and to apply the method of grouping the cluster to reduce the energy consumption.
- Regarding scheduling the thesis proposes hierarchical cluster based mechanism and scheduling algorithm by considering static and mobile scenarios for node and sinks for efficient bandwidth utilization.
- Regarding synchronization the thesis apply synchronization algorithm based on cluster spanning tree mechanism to achieve level by level synchronization on the hierarchical structures

The proposed technologies are verified by the integral system level simulations, which demonstrate the contributions in scientific research and engineering practice.

Oral presentation and discussion

DNYANESHWAR SHRIRANGLAL MANTRI gave a presentation of about 45 minutes. The presentation was clear and well-structured and covered the contributions to the thesis well.

In the next one and a half hours, we had discussions about his thesis and contributions. DNYANESHWAR SHRIRANGLAL MANTRI was good in answering the questions and discussing the issues and the answers to the questions were of satisfactory quality. He demonstrated good knowledge in the area as well as focused competencies in the topic area of the thesis: 'energy efficient bandwidth management mechanisms'.

Furthermore, he was responsive to the constrictive comments by the committee. He had good perspective for the future work and line of research that can be based on his current work.

In both the presentation and discussions, he demonstrated fluent knowledge and familiarity with state of the art research in the areas covered by his thesis.

Concluding remarks

In conclusion the committee unanimously recommends that DNYANESHWAR SHRIRANGLAL MANTRI is awarded the PhD degree.

Member 1

31.03.17

K.C. Chen

Member 2

K.P.Subbalakshmi

Member 3

Reza Tadayoni

AALBORG UNIVERSITET

Institut for Planlægning
Vestre Havnepromenade 5, 1.
9000 Aalborg

Telefon: 9940 8809
Email: mars@plan.aau.dk

Det Teknisk-Naturvidenskabelige Fakultet
Forskerskolen
Niels Jernes Vej 10

Dato: 21-04-2017

Vedr. " The development of a weighting method for use in life cycle assessments of amine based post-combustion carbon capture and storage (CCS) in the Arctic region ", Fredrik Moltu Johnsen, Institut for Planlægning

Hermed fremsendes bedømmelsesudvalgets Final Assessment vedr. ovennævnte ph.d. afhandling.

Instituttet anbefaler, at bedømmelsesudvalgets indstilling følges, og at Fredrik Moltu Johnsen tildeles ph.d. graden.

Med venlig hilsen

Marianne Sørensen

Assessment of PhD thesis

Title: "The development of a weighting method for use in life cycle assessments of amine based post-combustion carbon capture and storage (CCS) in the Arctic region"

Submitted by Fredrik Moltu Johnsen, civil engineer & MA (cand.mag).

The assessment committee consists of the following members as decided by the Dean of the Faculty of Engineering and Science:

- Professor, PhD, Michael Zwicky Hauschild, Technical University of Denmark
- Scientific Officer, Project Manager, PhD, Serenella Sala European Commission, DG Joint Research Centre
- Professor, MA PhD & Dr.scient. Finn Arler, Dept. of Planning, Aalborg University, arler@plan.aau.dk (chairman)

Supervisor: Ass. Professor, PhD Søren Løkke, Dept. of Planning, Aalborg University.
Co-supervisor: Senior Researcher Andreas Brekke, Østfoldforskning AS, Norway.

Short description of the thesis

The thesis consists of a "cap" and of 5 papers as appendices (3 of which have supervisor Søren Løkke as co-writer, and two of which have been published while the other three have been submitted for publication in international peer-reviewed journals). The cap of the thesis is 113 pages long, including 5 pages with English and Danish summaries and acknowledgements, 5 pages Tables of Content, of Figures, and of Supporting Papers, and a 10 pages long Reference list. The papers included as appendices are:

- Paper I: Johnsen FM (Forthcoming in 2017) The process of handling an excess of complex and interdisciplinary information in a decision support research situation. Submitted for publication: Interdisciplinary Description of Complex Systems. 7 pages.

- Paper II: Johnsen FM, Løkke S (2013) Review of criteria for evaluating LCA weighting methods. Printed in The International Journal of Life Cycle Assessment 13(4):840-849. DOI: 10.1007/s11367-012-0491-y. 34 pages.
- Paper III: Johnsen FM (2014) Bridging Arctic environmental science and Life cycle assessment: a preliminary assessment of regional scaling factors. Printed in Environmental Science & Policy 16(8):1713-1724. DOI: 10.1007/s10098-014-0752-5. 28 pages.
- Paper IV: Johnsen FM, Løkke S (Forthcoming in 2017) Weighting in Life Cycle Assessment (LCA) based on externally imposed restrictions: Slowness of reversibility of damage as an indicator of environmental value. Submitted for publication: Journal of Cleaner Production. 25 pages.
- Paper V: Johnsen FM, Løkke S (Forthcoming in 2017) Weighting in Life Cycle Assessment (LCA) based on externally imposed restrictions: Developing endpoint weighting factors based on regeneration time. Submitted for publication: Journal of Cleaner Production. 20 pages.

The background of the thesis is a wider project, "EDeCiDe", which aimed to identify quantitative information on the environmental feasibility of carbon capture and storage (CCS) in the Arctic region. In order to assemble information in a systematic way, Life cycle assessment (LCA) were used.

The main purpose of Fredrik Moltu Johnsen's (FMJ) thesis is to evaluate existing LCA methodologies for weighting various types of impact, primarily in relation to the use of CCS in the Arctic, and to propose principles for future "optimal" weighting methods. He sets up 6 research questions:

1. In general terms, which categories of facts are of higher rather than lower importance to LCA weighting?
2. What is a high-quality weighting method according to LCA experts?
3. What are the numerical priorities between different environmental impacts in the Arctic environment?
4. In view of sustainability concerns, can an "optimal" weighting methodology be identified?
5. What is the set of weighting factors that can be derived from this weighting methodology?
6. What are the implications for the environmental performance of CCS technology?

The Chapters of the cap

Chapter 1 introduces the wider background for the PhD project, the problem definition, and the research approach. Section 1.1 introduces terms involved in LCA and in weighting, and underlines the necessity to make site-specific assessments of the Arctic region, due to the unique geographical circumstances.

Section 1.2 introduces the problem definition of the project. It is emphasized that the "identification of a somewhat stable methodological ground for weighting" turned out to be quite challenging, as "a meta-methodology for identifying a weighting methodology" were required (together with a meta-meta-methodology for discussing or validating the meta-methodology, etc.). This need for a meta-level reflection turned part of the project in a philosophical direction.

This type of reflection is at least partly in opposition to the traditional procedures within the fields of industrial ecology and life cycle assessment, which – despite their trans-disciplinary, multidisciplinary and/or cross-disciplinary nature – are pervaded by what FMJ sees as an "engineering and natural science spirit" seeking tool-like and quantifiable answers. According to FMJ this bias all too easily leads to uncreative "tunnel vision" practices.

Furthermore, it is noted that the engineering and natural science approach have problems integrating the perspectives of all affected parties. This is most obviously the case with affected non-human animals, but it is also the case with affected humans with different worldviews and value sets. It is underlined that this cannot simply be reduced to a difference between traditionalistic, pre-scientific and superstitious conceptions and values on the one side and modern, more rational views on the other.

Chapter 2 presents the theoretical basis of the thesis including some theory of science reflections. The general approach of the project is described as a cross-disciplinary hybrid between an open-ended normative inquiry and paradigmatic "normal science". Afterwards it was recognised by FMJ that this may be close to what Funtowicz and Ravetz has termed "post-normal science", i.e. a kind of science with less strict methodological criteria of falsifiability and reproducibility than is the case with well-founded types of normal science.

Still, the logical structure of the project is described as relatively simple, moving through 5 steps: 1. Suggest a "high abstraction level" as an ordering and unifying principle in the information overload situation experienced in the project (Paper I). 2. Let experts emphasise different criteria for weighting methods (Paper II). 3. Select the suggested irreversibility criterion as basic in this

project (Paper IV). 4. On the basis of this criterion, weighting factors are deducted (Paper V). 5. Discuss the possibility of Arctic scaling factors for regionalisation of weighting factors (Paper III).

The consequentialist approach to (potential) environmental intervention found in LCA and LCA weighting has often been related to utilitarianism. Utilitarianism's problems with defining happiness or utility can, according to FMJ, be seen as mirrored in LCA's weighting question, how relative "severe" each unit of environmental impacts/damages is. As LCA only measures negatives, not positives, happiness or utility in the LCA context needs to be redefined as some form of avoidance of greater environmental harm.

Chapter 3 gives a short presentation of the papers in the appendices and of the considerations behind the papers. The chapter gives insights into the process of writing the PhD thesis, including the various and changing considerations that have influences the process.

Chapter 4 focuses on the case of carbon capture and storage (CCS). A central question is whether "a technological fix can be provided for a global warming which itself is a product of technology", or whether "we need to find a solution which to a larger extent is based on something novel" (T 76). The LCA weighting criteria from Papers IV and V are applied on the case in order to help finding an answer.

Conclusions are, firstly, that "As global warming is the all-important impact category in the results, the eventual cumulative CO_2 leakage from storage facilities will directly impact the final LCA results". Secondly, "the capture, transport and storage efficiency with regard to CO_2, as well as greenhouse gas emissions in the full life cycle, are apparently vital for the final results".

Chapter 5 is the concluding chapter. It is noted to begin with that calculation of LCA results involves an incorporation of immense amounts of diverse quantitative information about complex systems that are impossible to fully understand. It is therefore "tempting to slip into an anti-intellectual mode, and state that this decision process simply has to be surrendered to intuition, inspiration, chance or some form of higher power" (T 93). Weighting discussions therefore easily ends up in sophistry or in giving too much influence to a single weighting criterion.

Even though it is recognised that "placing blind trust in LCA weighting will predictably lead to poor decision-making", because "no number, however elaborate, should ever command an important decision on its own" (T 93), one should not exclude the use of weighting measures. It must be realised, however, that "In-depth knowledge about weighting as well as common sense, some form of "wisdom", are required in order to properly understand what this information actually

communicates" (T 93). Quantitative conclusions based on weighting schemes should always be surrounded by qualitative explanations and justifications of the used scheme and its basic principles.

The chapter sums up the answers to the 6 research questions. It is underlined by that the amount of empirical data gathered in this project is fairly limited, but that the methodological discussions as well as the scope covered have been wide-ranging (T 94). He also emphasizes that even though "LCA weighting is a somewhat naïve exercise, as it assumes that sustainability decisions can be summed up by only a small, but concise set of linear factors" the effort needed "to fully understand the factors their background and fundament" is "painstaking work" (T 101).

Chapter 6 discusses perspectives and gives recommendations for further future research. The list is long, and a few examples will suffice. Firstly, "It may be further investigated to which extent the level of construal impacts valuation/weighting, and whether weighting can be performed at all from an "individualist" or even "egalitarianist" perspective" (T 99). Secondly, "The effect that psychological distance in LCA has on eventual decisions, as well as potential countermeasures to this, can be explored". Thirdly, the relation between virtue ethics and "temperate" estimates can be given more attention. Fourthly, the "consequential" rebound effects of the degrowth alternative should be given more consistent attention. Fifthly, An analysis of whether precaution is consistently applied across LCIA categories (e.g., human toxicity vs, climate change). Finally, It is suggested that it may be time to "evaluate whether older and by now lacking LCIA methods should be removed from or tagged with a warning in LCA software packages, or somehow partially merged with other methods" (T 104).

The five papers

Paper I intends to describe one possible way out of the moral relativism towards weighting, which is at least partly recommended by ISO 14044 (T 58). Out of the overload and lack of cohesion between the pieces of information investigated in the starting phase a road is sought, which "may lead to holistic understanding and next to communication and implementation of this understanding" (P 3). The paper describes 6 stages in the process of getting an overview of an issue: 1. Intuitive circumspection, 2. Confusion and lack of cohesion, 3. Generalisation and conceptualisation, 4. Contemplative "holistic" overview, 5. Specification, 6. Enhanced understanding.

Paper II tries to give a state of the art overview of LCA weighting schemes. It is noted that without weighting "the most important impact categories for the system in question cannot properly be identified, and certain elements of decision-making thus risk being handled in an intuitive or arbitrary manner" (P 19). However, "weighting methods can be derived from various academic traditions such as economics, law or decision theory, and these traditions can lean towards different value bases" (P 19). This causes problems with choosing between values and disciplines and give rise to problems with general acceptance and reproducibility.

The paper reviews criteria used in LCA literature for evaluating weighting methods (T 58, P 22). The criteria are classified into two types. Firstly, general or "abstract" criteria for weighting schemes at the level of ideas. These include relevance, applicability, operationality, feasibility, communicativeness, transparency, simplicity, reproducibility, broadness, inclusiveness, flexibility, verifiability, reliability, robustness, consistency, risk and uncertainty sensitivity, place sensitivity, ethical acceptability, and openness to participation of stakeholders.

Secondly, more specific or "concrete" criteria that are more linked to "how" to perform weighting. These criteria suggest "tangible opportunities for what could be used as input to "good" weighting schemes", proposing "characteristics of concrete environmental damage which should be taken into account by a weighting method" (T 63, P 18). These criteria include human health, ecosystem health, seriousness of harm, scale, irreversibility, scarcity, risk of extinction, resource depletion, substitutability, timespan, uncertainty, probability, distance-to-target, willingness-to-pay, and stakeholder preferences.

FMJ emphasises that the application of such criteria is confronted with the challenge of balancing the relative importance of each individual criterion. "Criteria may be hand-picked for ad-hoc argumentation in favour of a pre-defined conclusion, rather than for use in an open-ended inquiry. Hence, it is obvious that lists of criteria cannot and should not replace analytical insight and reflection" (P 39). It is also noted that "the weighting step seems to be inadequately understood in the LCA community, and its workings appear to be regarded as somewhat mystical"; it is too often forgotten that "academia does not only comprise science; both science and values are objects of academic inquiry" (P 45).

Paper III deals with Arctic scaling factors in the context of LCIA. The purpose is "to pragmatically improve weighted scores in LCA for Arctic conditions", in order "to increase the relevance of Life cycle assessment for emissions to the Arctic region" by overcoming the "insufficient spatial diversification, which "is a recurring weakness of LCA" (P 54). The suggestion is that this can be

achieved by defining "regional scaling factors, which numerically compare the Arctic to a site-generic, typical "reference region"" (P 56). E.g., if a scaling factor equals 5, one unit of acidification would be 5 times "more severe" in the Arctic than in a site-generic reference region (typically Europe) (P 56).

Still, "it is not obvious how the environmental severity of these impact categories compare to one another in relative terms". The weighting step of LCIA is "an attempt to assign quantitative weighting factors that essentially constitute trade-offs between each impact category" (P 54). "In practice, not everything of relevance can be quantified if LCA is expected to give a "holistic" assessment" (P 54). On the other hand, the risk of not weighting is that "decision makers, not knowing which impact categories are more important, may end up making sub-optimal or, perhaps, virtually random decisions on the basis of an LCA study" (P 54).

The paper investigates the priorities of Arctic scientists and researchers to the Arctic environment, because these experts "were presumed to be more likely to possess knowledge about the somewhat technical terms involved in the study" (T 64). Out of 209 surveys sent to Arctic environmental scientists, only 8 responses were returned, however (P 59). FMJ explains that respondents "were implicitly expected to create an appropriate numerical frame of reference; however, it can be conceived that this is very challenging" (P 69). The results still give an indication of what is important (T 66, P 53).

Paper IV intends to "overcome survey biases and to identify generic weighting factors instead based on some form of "quasi-objective" data" (T 58). The aim is to "identify any objective or semi-objective principle in the literature review which can serve as a unifying principle for the "total environment" in accordance with the scope of LCA" (P 91). Whereas most current LCA weighting/valuation schemes are based on subjective or societal values, Paper IV aims to "identify a method of weighting derived from limits imposed on man by the environment" (P 82). It will thus present arguments for a weighting/valuation paradigm "that aims be closer to the «essence» of «good» weighting" (P 86). This procedure is in accordance with a "fatalist" perspective and a candidate principle for a "quasi-objective" weighting method (P 91). The selected factors are allegedly "independent of human opinion and will" (P 82), and does not "favour individually or socially constructed truth" (P 91).

Two such quasi-objective (or "fatalist") principles are identified: substitutability and reversibility (P 82). "Reversibility and the substitutability of the damaged item are two principles for "good" weighting (T 66). "If a safeguard subject (or damage category) is not substitutable for anything

else, it somehow belongs to a sphere of "invaluable" objects" (T 66). Substitutability can be related to "the need to safeguard an item in the first place, that is, the choice of which damage categories to investigate in LCA" (P 96). The regeneration time of the safeguard subject is a measure of its irreversibility (P 96).

Paper V details the final gathering of data from literature sources. This result is a set of generic endpoint weighting factors. "The logic of Papers IV and V is that environmental damage does not provide a full measure for the environmental "depression", "gravity" or "tragedy": in order to assess the latter, one has to consider both damage and the subsequent regeneration" (T 68). This excludes a variety of perspectives, including "the important justice perspective: who should be allowed to inflict environmental insults onto whom, and for which purposes" (T 68).

The two explicit normative underpinnings of the suggested methodology are: 1. "The environmental categories safeguarded by the damage categories of LCA (ecosystems, human health, resources) all need to be sustained. Thus, the first principle is that they cannot be damaged". 2. "If environmental intervention and environmental harm is unavoidable, a second principle applies: The three damage categories should be weighted according to how long time it takes to reverse the damage to the category" (P 114). It is assumed that "the regeneration time of a safeguard subject is assumed to be an indicator of its "value"" (P 114).

General assessment

The thesis is written in a good and understandable English, even if sentences are often written in a colloquial style. FMJ gives a good presentation of and reflection over the methods that he has applied in his research. However, the presentation in the thesis intentionally follows the approach that he has followed throughout his work, and this reduces the clarity of the flow of the methodology presentation. FMJ has chosen to let the flow of the thesis follow the cognitive process that he has been through on his way to where he stands now. This makes the description somewhat unfocused at places with some detours in the flow, even though it is overall understandable and pedagogically explained.

It is unusual, but very positive that FMJ is capable of combining competences in the field of environmental science and LCA with competences in philosophy and ethics. This makes it possible for him to deal with issues that may otherwise be ignored too easily. It would have strengthened the thesis significantly, however, if the use of philosophical and ethical theory had been more

systematic. A great variety of authors and viewpoints are brought into the cap, but FMJ is never really following up on the introduced points in any systematic way. In parts of the thesis the text appears to be more a "stream of consciousness" than a systematic presentation.

FMI several times seems tempted to call his project "post-normal" or "post-paradigmatic". This is hardly the case, though, at least not in all parts. The project could just as well be seen as solidly seated within the LCA paradigm. Much of the discussion is part of this paradigm's traditional internal discussions – taking place amongst defenders of typical sub-paradigmatic positions – even though FMJ tries to integrate points and insights from external sources. The fact that the project may best be conceived as a normal puzzle-solving scientific effort situated within a fully consolidated paradigm is confirmed by the number of references to paradigm internal articles dealing with similar issues, based on similar assumptions (including common dogmas and prejudices).

The study's paradigm conformity is also confirmed by the problem formulation itself: the search for an "optimal" weighting methodology. To a large extent, FMJ actually seems to be (too) willing to accept the type of claim found among some LCA practitioners that one can equate subjective, impulsive, irrational, intuitive, arbitrary, value-based, un-scientific and qualitative, all of which must be contrasted with objective, rational, value-free, scientific and quantitative. He sometimes seems to accept the idea that a "fully" rational science must proceed through "optimal" automatic procedures that can be repeated and always end up with the same results.

Consequently, it is assumed that research becomes less scientific, if a variety of strategies are accepted, maybe even considered reasonable, even though they are likely to end up with different results that need to be interpreted qualitatively and on the basis of values in order to grasp their relative significance. This rather mechanical conception of good science, based on a stiff-legged subjective/objective dichotomy, causes a lot of trouble for him, however, because it means that he intends to make rational research into issues that he has to consider irrational.

FMJ keeps searching for a "correct" and at least "quasi-objective" weighting methodology that would be approved, even when "viewed from nowhere" or from a position "behind a veil of ignorance" about one's own position in the world. Otherwise, he considers it to be subjective, random, arbitrary and of no use. This makes him skeptical about weighting methods that "ultimately, at some level or another, are based on individual opinion or some form of established societal preference, whether through monetary or non-monetary methods" (P 89).

But *sub specie aeternitatis* the irreversible loss of a human life or of a biological species counts as little as the just as irreversible loss of a bolt dropped from a ship. Weighting is never done from nowhere, but always from a specific position, where certain impacts are considered more valuable than others. And the alternative to eternal objectivity needs not be arbitrary, subjective opinion or preference based. Weightings and valuation can be both reasonable and well argued without being objective in any sense.

This inclusion of reasoned valuations actually takes place long before the specific weighting step is reached. The choice of categories to include in an LCIA could never be made without valuing the importance of impacts, nor would methodological choices like normalization be possible without it. Even though these choices inevitably are made from the specific point of view of human beings placed at a specific place and period within the life of the universe, they need not be arbitrary and subjective. Nor do they have to be narrowly selfish in any sense. They can be intended to be impartial and based on the best arguments available at this specific time and place.

The overall aims identified by FMJ are far from selfish, but certainly value-laden and definitely controversial. The aims are, firstly, "to protect a presently deficient equilibrium of the full environment or Earth system" (P 108) or "a homeostatic or (self-) regulating system in which the total number of species historically has sustained itself at a more constant level than at present" (P 117). The second purpose is to propose some definitive limits for interaction with the environment/nature in the tradition from "limits to growth", "biocapacity" and "carrying capacity" to "planetary boundaries" (cf P 97). This is described as an approach aimed at weighting with "a more objective value base" (P 113) founded on "some objective or otherwise firm ground" (P 114), and related to deontological ethics rather than pragmatism (P 114). The ultimate purpose is also described as to protect "necessary life systems" (P 114), even though it is not clear what makes the specific current systems necessary. In general, it is "assumed that anthropogenic environmental damage drains or works against the regenerative resources of these systems" (P 124).

FMJ notes that a negative aspect of the scheme is that "it primarily acknowledges classes of subjects, not individual subjects, as valuable", and concludes that "perhaps indicators in general are not well suited for retaining the interests of individuals" (P 104). This leads FMJ to admit that complementary structures may be required for different purposes (P 105). This acceptance of different perspectives is "a concession that we are in the realm of post-normal science" (P 105). It is also repeatedly mentioned that qualitative considerations are important. Paper V even warns us that "there is always a risk that weighting factors will replace critical thinking and common sense in LCA" (P 124). It also warns against "hyper-precision", i.e. presentations that appear much more

exact than they actually are. Thus, the thesis often seems in conflict with itself, and it is not altogether clear, whether the different standpoints belong to different steps in FMJ's journey, and whether he ends up with one coherent conclusion.

From a current LCA standpoint, the strong weighting of climate change due to its impacts on ecosystem health is in conflict with existing damage weighting factors. It is well justified in the developed and applied methodology, though, and constitutes an interesting and important result, but a further discussion of its general validity and implications would have been appropriate – essentially, it means that LCIA can be reduced to a carbon footprint assessment henceforth. This is obviously an interesting new perspective in the work, but the quality could have been improved by a deeper analysis both of the results, their uncertainties and general applicability and of their consequences. Moreover, a more ecology-oriented research would have been valuable. The concepts of reversibility and regeneration are key concepts in the ecological domain, and they remain superficially treated in the thesis.

The developed weighting method is used to develop weighting factors at damage level for the ReCiPe LCIA method and the resulting weighting factors are applied to one case (CCS in the arctic region). The case study seems to have been dictated by the project that has been paying for the PhD scholarship, but the presentation of the general development of the weighting method and the specific adaptation to the case study and application could have been more systematically presented. Moreover, consequences of the proposed approach beyond the presented (limited) case study would have been beneficial to improve clarity and usefulness of the results.

The research questions could have been sharpened and presented more clearly but they are all explicitly met and answered to the extent that the research results support. FMJ has done a thorough study of the existing literature on theory and practice of weighting and used it in the planning and discussion of his own work. However, the literature in the ecology domain has been barely cited/mentioned, and the use of ethical and philosophical literature is unsystematic.

The research results are presented in five papers, two of which have been published and three submitted. The thesis gives an interesting introduction to the field and a thorough synthesis of the results presented in the papers. The thesis concludes with a detailed discussion of further work that should be done within the area of each of the papers, offering an interesting reflection on FMJ's own research results.

Conclusion

On the basis of the arguments presented above, the committee unanimously recommends that Frederik Moltu Johnsen's PhD thesis is accepted for public defence.

Defense

On March 31 the public defence of the doctoral thesis took place. After a 45 minutes presentation of the thesis, Frederik Moltu Johnsen was confronted with a number of questions and objections related to the thesis. The whole defence lasted for about three hours, and everything went well. Frederik Moltu Johnsen's presentation at the public defence was clear, and he gave reasonable and satisfying answers to most of the questions, worries, and objections posed by the opponents and engaged well in the discussion. The assessment committee approves the thesis as qualified, and conclude that Frederik Moltu Johnsen has passed the exam. We therefore recommend that Frederik Moltu Johnsen be appointed *philosophiae doctor*.

March 31, 2017

Serenella Sala   Michael Zwicky Hauschild   Finn Arler

Det Teknisk Naturvidenskabelige Fakultet
Niels Jernes Vej 10
Att.: Ph.D. udvalget

Date: 06-04-2017

Gissel Velarde – "Convolutional Methods for Music Analysis"

Hermed fremsendes bedømmelsesudvalgets indstilling vedr. Gissel Velardes ph.d. afhandling, som hun forsvarede den 6. april 2017. Af indstillingen fremgår, at bedømmelsesudvalget anbefaler, at Gissel Velarde bliver tildelt ph.d.-graden.

Instituttet indstiller hermed, at Gissel Velarde tildeles ph.d.-graden.

Med venlig hilsen

Malene Munkholt Kristensen

Bilag: Bedømmelsesudvalgets indstilling

Assessment of the PhD thesis entitled: Convolutional methods for music analysis

Full title of the thesis: Convolutional methods for music analysis

Submitted by Gissel Velarde, M.Sc. in Electronic Systems and Engineering Management

The assessment committee consists of the following members as decided by the Dean of the Technical Faculty of IT and Design by 2017-01-25:

- Member 1: Professor José Manuel Iñesta Quereda, Department of Software and Computing Systems, Universidad de Alicante, inesta@dlsi.ua.es
- Member 2: Associate Professor Emilia Gómez, Universitat Pompeu Fabra, emilia.Gomez@upf.edu
- Member 3 (chairman): Associate Professor Cumhur Erkut (chairman), Department of Architecture, Design and Media Technology, Aalborg University Copenhagen, cer@create.aau.dk

Supervisor for the thesis has been Associate Professor David Meredith, Aalborg University.

Co-supervisor for the thesis has been Senior Lecturer Tillman Weyde, City University of London.

Description of the thesis

The thesis is a collection of papers, 186 pages in total, including covers. It consists of an Introduction and the following six papers:

- Paper 1: Wavelet-filtering of symbolic music representations for folk tune segmentation and classification. Velarde, Gissel; Weyde, Tillman; Meredith, David. Proceedings of the Third International Workshop on Folk Music Analysis (FMA2013). Meertens Institute; Department of Information and Computing Sciences; Utrecht University, 2013. p. 56-62. Publication: Article in proceedings, published.
- Paper 2: An approach to melodic segmentation and classification based on filtering with the Haar-wavelet. Velarde, Gissel; Weyde, Tillman; Meredith, David. In: Journal of New Music Research, Vol. 42, No. 4, 2013, p. 325-345. Publication: Journal article, published.
- Paper 3: A wavelet-based approach to the discovery of themes and sections in monophonic melodies. Velarde, Gissel; Meredith, David. 2014. Music Information Retrieval Evaluation eXchange, Taipei, Taiwan, Province of China. Publication: Conference abstract of the algorithms submitted for evaluation at the Music Information Retrieval Evaluation eXchange (see http://www.music-ir.org/mirex/).
- Paper 4: A Wavelet-Based Approach to Pattern Discovery in Melodies. Velarde, Gissel; Meredith, David; Weyde, Tillman. Computational Music Analysis. ed. / David Meredith. Cham, Switzerland: Springer, 2016. p. 303-333. Publication: Book chapter, published.
- Paper 5: Composer Recognition based on 2D-Filtered Piano-Rolls. Velarde, Gissel; Weyde, Tillman; Cancino Chacón, Carlos; Meredith, David; Grachten, Maarten. Proceedings of the 17th International Society for Music Information Retrieval Conference. 17. ed. International Society for Music Information Retrieval, 2016. p. 115-121. Publication: Article in proceedings, published.
- Paper 6: Convolution-based Classification of Audio and Symbolic Representations of Music. Velarde, Gissel; Cancino Chacón, Carlos; Meredith, David; Weyde, Tillman; Maarten Grachten. Publication: Journal article. Submitted to Journal of New Music Research.

Assessment of the thesis
We thank the Faculty for the opportunity to review Gissel Velarde's manuscript and hereby present the following statement, based on the instructions at http://www.phd.tech.aau.dk/assessment-committees/.

The research reported in the present manuscript is highly original and tackles pertinent issues in computational music analysis. It is expected that the developed techniques, obtained results, and lessons learned will advance the development of sound and music computing as a field, specifically in computational music analysis and music information retrieval. While there are voluminous previous accounts on computational music analysis, the manuscript stands out in its systematic approach, clarity, practicality, framing, and applicability.

The thesis is based on six papers. Mini-reviews of these six papers are provided below.

- *Paper 1,* presented at FMA workshop, evaluates the use of wavelet transform (using Haar wavelet) of pitch sequences and local maxima of wavelet coefficients for the segmentation and classification of music segments. MIDI representations are converted into pitch sequences, where rests are eliminated, and are normalized with respect to the average pitch. The authors then apply a continuous wavelet transform (CWT) using the Haar wavelet. Local maxima of wavelet coefficients are used to detect segments and classify them using k-Nearest Neighbour algorithm (Euclidean and City block distances). In their experiments, the authors use a collection of 360 monophonic songs classified into 26 families to combine his approach with the well-established LBDM algorithm by E. Camboroupoulos. The results are slightly superior than LBDM but still less accurate than SoTA (Kranenburg et al. 2013).

- *Paper 2,* published at Journal of New Music Research, applies the method described before to the previous dataset plus Bach's Two-Part Inventions (BWV 772-786). The paper provides a justification on the selection of wavelet transform (Haar) and compares segmentation based on local maxima of wavelet coefficients vs based on detecting zero crossings of the inner product between the melody and the Haar wavelet. Segments are normalized to the same length or zero-padded to have the same length (zero-padding provides slightly better results). The issue of temporal scale is also discussed.

- *Paper 3,* published at MIREX 2014 (not peer-reviewed), described a computational approach for pattern discovery based on the wavelet transform and agglomerative hierarchical clustering.

- *Paper 4,* book chapter, provides an extensive description of the previous paper plus the results of MIREX evaluation. Results indicate that the approach is state-of-the-art compared with alternative strategies for pattern discovery.

- *Paper 5,* published at ISMIR, tests the effect of using two different filters for classification in 2D. No significant difference has been found between classification results when using Gaussian filter or Morlet wavelet.

- *Paper 6, submitted to Journal of New Music Research,* reports experiments with convolutional neural networks (CNNs), where the filters are learned from data. The resulting filters relate to musical features.

The content of the extended summary/monograph is evaluated, with attention to the following aspects:

- *Formulation of research questions or hypotheses:* Research questions are indicated explicitly as follows:
    o To what degree can convolution support the analysis of music in relation to segmentation, pattern discovery and classification?
    o What are the best techniques and parameter settings for carrying out such tasks?
    o How can we understand a convolution-based representation of music from a music-theoretical and perceptual perspective?

- *State of the art including a critical approach to other researchers' results.* State of the art (SoTA) is deeply examined and reported. In most cases, other researchers' results are reproduced and / or presented comparatively. The results are comparable to (if not better from) the previous work.

- *Methodology.* The methodology is concisely outlined in Section 7, and illustrated on Figs. 1.1-3. The methodology relies on numerical analysis methods on first symbolic data, then a 2D combination of symbolic and audio data for extracting relevant features of music for representation and segmentation.

When segments are at hand, machine learning algorithms are used for classification, clustering, and pattern discovery. The effects of the segmentation on classification and pattern discovery have been separately discussed.

- *Experiments, numerical simulations etc.* The methods developed are extensively tested. We especially note the participation to MIR Evaluation eXchange campaigns. Results are substantial and they demonstrate:
  - o In music segmentation, the classification accuracies obtained when segmenting with two methods developed in the dissertation are comparable to a traditional approach, Local Boundary Detection Model (LBDM) (Papers 1 and 2).
  - o In pattern detection, the accuracies are comparable to state of the art algorithms evaluated in MIREX 2014.

- *Research contributions and quality.* We see the main scientific contributions in the following items, and find their quality acceptable in scientific practice.
  - o *Novel music representations based on wavelet transform.*
  - o *Evaluation in the context of segmentation and classification of symbolic, and later audio-based music material.*

- *Link between the extended summary and the papers:* Each paper contributes to the research questions and hypotheses, experiments, methodology, and provides answers that completely cover the three application domains.

- *Quality of the dissemination of science and engineering results:* The dissemination of science and engineering results is of sufficient and acceptable quality, as evidenced by one published paper in and another submitted paper to the Journal of New Music Research (JNMR). The 2015 Impact Factor of JNMR is 0.771 and its ranking is 89/104 (Computer Science, Interdisciplinary Applications), according to the 2016 release of the Journal Citation Reports by Thomson Reuters.

- *Quality of the conclusions:* Conclusions are sufficiently supported by the work done and results obtained. The future work clearly indicates the next steps.

- *Link between research problem(s)/hypotheses and results/conclusions:* Similar to the research questions, the general and specific objectives of research are specified on Section 6.
  The general objectives were:
  1. *to develop and evaluate and automated framework for musical analysis based on convolution, with applications to*
     - *segmentation*
     - *classification*
     - *pattern discovery.*
  2. *to study filters in relation to music-analytical and perceptual properties.*

  The specific objectives were:
  - o design, implement and evaluate a framework applying convolution as the basis for the structural analysis of music applied to segmentation, pattern discovery and classification, and compare it with other algorithms;
  - o evaluate 1-D and 2-D filters for structural analysis in relation to music analysis and perception;
  - o evaluate and test systematically the use of filters, features of coefficients, time scales and similarity measures in classification tasks (e.g., composer, genre, tune-family classification) and pattern discovery (e.g., motivic analysis) in order to find the best techniques and parameter settings; and
  - o relate filters to musical properties.

The project objectives, both general and specific, have been met.

- *References – have solid references been used properly*? References are correct and have been used properly.

The presentation of the dissertation is excellent. The language is fluent and correct, and proceeds logically. The written expression complies with the conventions of academic writing. The tables and figures are informative and the overall layout is generally clear. Especially Tables 1 and 2, which place each publication's techniques, algorithms, methods, applications, and contribution to the 1- or 2-dimensional analysis in computational music analysis is of great clarity.

Main contributions of the thesis: Systematic investigation of the use of wavelets for computational music analysis, expansion of the method to audio analysis, and generalization as convolutional analysis.

Strengths: representations alternative to SoTA and insights on the use of wavelet transforms for multi-scale music representations valid for segmentation and pattern detection. In those tasks, the results are comparable to SoTA, or better.

Weaknesses: Introduction could have been more concrete; it currently does not include a proper formalization of representations (1D & 2D, convolution and wavelet transform, local maxima / zero crossing detection, segment similarity and clustering). Different representations are listed in sections 10.1 and 11.1, with references to more detailed descriptions in the papers. Brief definitions of the terms could have been included in the introduction. The introduction could also have some running examples of each of the different representation types, and show the effects of the various different processes described on these examples.

Oral presentation and discussion

Date and Place of the oral defense: April 6, 2017, Aalborg University, Rendsburggade 14, Seminarrum 3.563

The oral presentation was of excellent quality, providing clarification, and in most cases, clear answers to the issues we have previously indicated as weaknesses in our preliminary assessment. We have particularly liked the historical motivation, the context, and the formalization of the research problem. Subsequently, the candidate showed excellent command and ability to conduct a scientific discussion. She has answered all the questions raised by the committee members in a satisfactory manner. She has also elaborated the choices available in the research work, and justified them. We have positively evaluated her ability to disseminate research outcomes in an effective way.

Conclusions: The committee unanimously recommends that Gissel Velarde is awarded the PhD degree.

Dated and signed by all members of the committee.

Member 1

April 6TH 2017

Member 2

April 6th, 2017

Member 3

April 6th, 2017

AALBORG UNIVERSITET

Institut for Planlægning
Vestre Havnepromenade 5, 1.
9000 Aalborg

Telefon: 9940 8809
Email: mars@plan.aau.dk

Det Teknisk-Naturvidenskabelige Fakultet
Forskerskolen
Niels Jernes Vej 10

Dato: 05-05-2017

Vedr. "Laboured Learning, Investigating challenged localities through a geography of vocational education", by Karin Topsø Larsen, Institut for Planlægning

Hermed fremsendes bedømmelsesudvalgets Final Assessment vedr. ovennævnte ph.d. afhandling.

Instituttet anbefaler, at bedømmelsesudvalgets indstilling følges, og at Karin Topsø Larsen tildeles ph.d. graden.

Med venlig hilsen

Marianne Sørensen

The Assessment Committee' report regarding Karin Topsø Larsen's PhD degree

Thesis submitted by Karin Topsø Larsen to The Faculty of Engineering and Science, Aalborg University for the Degree of Doctor of Philosophy.

Title of PhD.-project
'Laboured Learning – Investigating Challenged Localities Through a Geography of Vocational Education'

Supervisor
Associate Professor, Enza Lissandrello, Aalborg University and Professor Anne Lorentsen, Aalborg University

Members of the Assessment Committee
Professor, Christian Helms Jørgensen, Roskilde University
Professor, Gry Paulgaard, The Arctic University of Norway
Professor, Lars Bo Henriksen, Aalborg University (chairman)

Study Period and Department
01-12-2012 - 10-01-2017 at Department of Development and Planning, Aalborg University

PhD. -thesis
The thesis 'Laboured Learning – Investigating Challanged Localities Through a Geography of Vocational Education' has been submitted in the form of a monograph, 240 pages.

The content of the Ph.D. thesis
The thesis investigates challenged localities and the role of VET (vocational education and training) systems for young people in these areas. Especially concerning young people's mobility patterns and choices in relation to vocational education and training.

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Assessment of the thesis

Overall, the thesis is interesting and well written. The research represented in the thesis is a very significant and important contribution to the field geography of education. The thesis demonstrates the ability of the author to handle complex problems with regard to state of the art investigation, research, theory and method.

The thesis is well structured and very well written at the level of spelling, punctuation and grammar.

The thesis consists of nine chapters and three appendixes and is divided into five subsections.

Section I consists of chapters 1 and 2. Chapter 1 is an introduction and a framing of the overall problem, that certain areas in Denmark, primarily outside urban areas, are challenged by i.e. declining population, reduced opportunities for employment and that the vocational training system in these areas have its own problems. Chapter 2 is describing the content of the thesis.

Section II consists of chapters 3 and 4. Chapter 3 describes the geography of education and is the theoretical background of the thesis. Chapter 4 describes the methods applied and their connection to the thesis' problem and theories.

Section III consists of chapter 5. The chapter is an analysis of the VET system in Denmark and its development.

Section IV consists of chapters 6 and 7. Chapter 6 is a statistical analysis of young vocational students' mobility patterns and chapter 7 is an interview based analysis of young vocational students' orientations and behaviours.

Finally, Section V consists of chapters 8 and 9. Chapter 8 presents conclusions and chapter 9 is perspectives on the thesis' findings.
The three appendixes present A. rural and urban municipalities in Denmark, B. a list of vocational training programs and the number of places where they are provided and C. employment status, youth cohort 2000.

Chapter 1 is an introductory chapter presenting the ideas behind the project: Challenged areas, the VET system and young vocational students' migration patterns.

A challenged area is characterised by high rates of employment within agriculture, manufacturing industry and tourism; greater drop in employment during economic crises; slower recovery after crises; relatively high shares of unskilled and vocationally educated labour and low shares of highly educated labour; a decline in population, an aging population; high shares of youth out-migration; higher shares of vacated premises; relatively low housing prices (p. 19). The VET system is also challenged even if most expects a shortage of vocational trained labour in a very near future. The challenges are described as fewer students, a higher dropout rate and a lack of apprenticeship positions.

This leads to the thesis' main objective 'to generate knowledge about the forces that drive uneven development and the role particular education systems play in such processes' (p. 23).

The chapter provides a good introduction to the work done, and raises also questions that need to be addressed in the remaining parts of the thesis.

Chapter 2, is a short presentation of the content of the thesis.

Chapter 3 presents the thesis' theoretical foundation in education geography. The chapter presents 1. Educational institutions, 2. Student catchment areas and 3. Regional contexts. It is found that the '... educational institutions and their educational programs are significant producers of space because they function as structures of opportunity for young people in given localities' (p. 33). The student catchment area is described as a 'school district' as in primary and secondary schools. However, a very significant difference is that the 'school district' for the vocational training system is market driven and the students can choose to migrate out of the area. This leads to the question: 'What are the factors that influence education provision structures, including the size of catchment areas, within the

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vocational education and training system in challenged localities?' The regional context is described as 'The composition of student socioeconomic status within a given catchment area, including formal education levels, labour market positions and income levels, relies on the occupational and educational opportunities in the region, where the given education institutions and their catchment areas are located'.

Changes, or uneven development – peripheralisation and centralisation - in the three areas are then analysed in relation to dominant production paradigm, to governance, to socio-spatial student intakes and finally mobility imperatives and outmigration. These analyses then lead to two analytical frameworks; 1. VET spatio-temporal development and 2. Transition orientation preferences.

The chapter's analyses conclude with three research questions: the first concerns the VET system, the second the young VET students and finally the challenged localities.

The chapter gives a good overview of the field VET education, challenged areas and education geography.

Chapter 4 presents the thesis' methods. The chapter is divided into three main areas; methodological approach, approach to use of theory and research practices. The chapter gives a fine overview of the methods applied in the thesis. Especially the last part describing the actual research methods – statistical analyses and interviews. In both cases, we are presented the reasoning behind the choices and a thorough description of the chosen locations where the research is taking place.

Chapter 5, called the geography of vocational education, is a description of the Danish VET system. Its historical background, its development and its current status. The description is divided into time periods – 1400-1889, 1889-1945, 1945-1970s, 1970'-1990s and 1990s-1915 - and each period is analysed according to the structure developed in chapter 3 - dominant production paradigm, governance, socio-spatial student intake and mobility imperatives.

The chapter concludes that the Danish model for VET education is a result of a corporatist development where negotiations between state, employers and labour unions have forged a compromise that resulted in the current state of affairs (p. 108). Further, concludes the chapter that the VET system is more important for challenged areas, because of their reliance on traditional industries and skilled labour. The chapter ends with a description of the recent changes in the VET system of 2015.

The description and the analyses is very interesting and very thoroughly carried out.

Chapter 6 describes 'VET student mobility patterns'. The purpose of the quantitative analysis is to analyse vocational education choices and student mobility patterns in rural settings. Further the analyses include the role of gender, vocational field and access to local education provision and thereby investigate mobility patterns amongst three cohorts of VET students from Bornholm, Jammerbugt and Frederikshavn municipalities.

The analysis uses register based data from Statistics Denmark from the year 2000 and compared with the same population in the year 2011.

Based on these analyses, the chapter concludes that there is a huge difference between the out-migration patterns depending on type of education. The study confirms that academically educated candidates have a higher tendency to out-migrate (70-80%), than vocationally educated candidates (40-50%). These again have a slightly higher tendency to migrate than un-skilled labourers do (40%).

The vocational field also influences on out-migration patterns. Commerce and administration VET candidates have a higher tendency to out-migrate than candidates from iron and metal, building and construction and child and healthcare. This has to do with the structure of the local labour marked and the chapter concludes that the VET system is important for the local labour marked.

Almost 70% of the VET students are attending local VET schools and proximity is therefore important for both students and local labour marked, and the chapter

point out a connection between local VET programs, local labour markets and out-migration patterns.

Chapter 7 has the title "Transition behaviour and orientation preferences". The analyses are based on 23 interviews with VET students. Based on these interviews the students are divided into three groups based on their 'spatial orientation preferences'. The vocationally orientated, the locally orientated and the mobility orientated. The interviews with the students show significant differences in the students' preferences. Based on the analyses of the interviews the chapter point out that:

'The vocationally oriented do not have a spatial preference, but are dominated by their focus on vocational characteristics and relating it to their own skills, aptitudes and interests.' In this group, there is a majority of students with parents with a vocational education.

'The locally oriented have their relationship to people and places in their home community at the forefront of their orientation process. Although they also orientate themselves vocationally, their dominant orientation frame is their local area.' In this group, there is a majority of students with parents without any formal education.

'... the mobility oriented, who are dominated by their individual imperative to move out of the community they have grown up in as the centre of their education transition. This has vocational as well as locational repercussions for them.' (pp. 192)

The chapter is well structured and the interviews give an interesting view into the young peoples' motivation and choices. The analyses of the chapter once again confirm the connection between the VET students, the local community and the accessibility to VET training.

Chapter 8 is the concluding chapter with the title "The highway or the byway". The chapter sums up the different chapters and present the conclusions of the study.

The title of the chapter points to the fact that many young people (and especially their parents) regard the VET system as a byway, whereas the academic track, the high school, is regarded as the better option for more prospective future. The research findings in the thesis can to some extent justify this. There are several obstacles in the VET system, one would not find in the high school system. E.g. proximity to specific programs, finding an apprenticeship placement etc.

Chapter 9 has the title "Perspectives" and presents some policy perspectives. In the chapter KTL gives some very relevant critical assessments of recent policy initiatives, and in addition she is able to make some very relevant policy recommendations.

Overall assessment

The overall impression of the thesis is that the work done by Karin Topsø Larsen is a very valuable contribution to the understanding of the overall research question about the geography of education and in particular vocational education and challenged localities. Throughout the thesis, she delivers some very interesting analyses. The work done demonstrates a thorough understanding of the complexities of the geography of education and a comprehensive knowledge of the field, challenged localities and VET. Even though education and mobility is well documented in research, vocational education and mobility has not had the same attention among researchers and policy makers. This is also the case for the relatively new research field geography of education, where research mainly has focused on compulsory or higher education in urban settings.

The dissertation is important both in relation to research and in relation to the current political aims of making more young people enrol in vocational education at upper secondary level (VET). It demonstrates convincingly how the interplay between spatial, socioeconomic and individual factors contributes to the

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differentiation of the student population and to the marginalisation of some students in VET. By including the socioeconomic dimension, it challenges some common-sense notions of the significance of peripheral location in educational geography. It is valuable that it concludes with a number of well-founded recommendations for future policy to combat the problems that it identifies.

The theorizing and analyses of how uneven processes of peripheralisation and centralization are related to shifts in key education system spaces is very convincing, representing an important contribution for the research on education and regional development.

In addition to the conceptual innovation by introducing the terms "vocational literacy" and "spatial illiteracy", the dissertation also introduces the term "spatial transitionality" and "spatio-vocational transition imperatives". The concept "spatial transitionality" builds on Karen Evans' concept "bounded agency" defined as "social situated agency, influenced, but not determined by environments and emphasizing internalized frames of reference as well as external actors" (see quotation page 49) (here one can see similarities with Bourdieu's concept habitus, but the author does not refer to Bourdieu). The concept spatial transitionary refers to the imperative to be spatially orientated in the VET-system. The concept "spatio-vocational transition imperatives" refers to the two key transition points of the VET system, the need for making both vocational and spatial decisions.

Both concepts emphasise the importance of space. The concepts might indicate an opposition to Giddens' concept disembedding, which is used to conceptualize education institutions as "institutions of disembedding" (page 32), but this is not done explicitly. Disembedding refers to changes that undermines the importance of place. Karin Topsø Larsen's analyses show that a large proportion of the VET students (app 70%) enter the most proximate vocational college for their VET program (page 147). The analyses in this dissertation highlights how space matters in the study of VET education and students, a more explicit and critical discussion of the concept disembedding and theories of increased individualization that is referred to in chapter 3 might therefore be appropriate.

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The mobility oriented are all females. It is of course not possible to generalize from a sample of five individuals, but the selection of the mobility oriented informants could be problematized and discussed methodically, as well as the analyses could have been elaborated by the use of other studies focusing on outmigration and the role of gender. At page 45 the author refers to some studies; Faber, Nielsen et. Al. 205, Faber 2014 and Lorentzen 2016.

The analyses of the internal tensions of the VET-system and its diverging interests provides a good understanding of forces shaping the system. The dissertation raises critique of some common assumptions about VET and contributes to a more nuanced and qualified understanding of for example gender patterns and dropout from VET.

It is a quality of the dissertation that it includes a historically oriented examination of the geography of vocational education. This however has some weaknesses. The dissertation points at a shift from an old industrial to a new knowledge based dominant techno-economic paradigm (TEPs) or production paradigm. This shift is seen as the main driver in the shifting spatial relocation of production and education institutions. This is an overly simplistic explanation that does not consider variations between different industries and regional clusters. Moreover, the functionalist assumption that the techno-economic demand is the key driver of the development of education systems underestimates the complexity of social forces shaping the VET-system, like endogenous dynamics of education systems and the role of policy as shown by Thelen, Archer and Bourdieu. It also ignores the specific national context in Denmark for example the role of the welfare state and the role of craft production and skilled labour (see flexible specialisation below).. In addition, the decline of the '*industrial production paradigm*' (p.75) cannot directly explain the development of some of the largest occupations in the Danish VET-system that are in construction (not an industrial occupation), car mechanics (a service occupation) or Health & Care or especially the Commercial occupations. While VET in other countries is more narrowly linked to craft and industrial production, this is not the case to the same extent in Denmark, where VET also has historical roots in major service occupations.

Following this, we can further add, that there seems to be some inconsistencies in the description of 'the dominant production paradigm'. The Danish industry is rightly described as a result of a development from former craft based production forms. But on page 88 it is argued the in the period after WW2 there was a rapid industrialisation 'characterised by largescale industrial factories that required semi-skilled labour'. This is debatable. First because, as is also described in page 106, the Danish industry is dominated by SMEs and could be described as being dominated by a flexible and specialised production. Fordist production forms never really existed in Denmark, except in the agricultural processing industries (slaughterhouses, dairies and breweries) and a few other places. The question is therefore whether the changes described in the international literature of 'the dominant production paradigms' also took place in the Danish industry? On page 106 we read: 'Firstly, labour markets that rely more heavily on vocationally educated or even unskilled labour are the central places of industrial production forms. Theoretically, then, the centres of the VET system, understood as the share of apprenticeship positions, are thus outside the largest urban centres, on peripheral labour markets. No studies have been made of this, and this study has not included the geography of apprenticeship markets'.

In contrast to this argument, Hull Kristensen (1996) has convincingly demonstrated how the VET system was instrumental in forming the Danish industry as primarily as a flexible and specialised system. When describing the development of the Danish VET system it is a weakness that the author has not included the Danish research based on theories of flexible specialisation and especially that of Hull Kristensen (1988, 1996, and more).

Further, parts of the historical analyses could be more precise. The alleged drastic decline in the position of VET in the labour market and in upper secondary education (p.106-7) is not documented. The alleged complete liberalisation (p.99) of the vocational education market in 1991 is contradicted by other researchers, like Thelen (2014). In relation to the effects of the establishment of the EFG and the changes in the spatial distribution of vocational schools in the period 1970-90 a number of relevant studies are not taken into account (Mærkedahl, 1978;

Nørregaard, Mærkedahl & Ørum, 1980; Uvm 1988). These studies indicate that one of the reasons for the remarkable recovery of VET after 1975 was the geographically dispersed establishment of the new EFG-programmes.

The reasons given for the selection of the students and the municipalities for the study of VET fail to address some important issues. All three peripheral municipalities are selected as 'challenged localities', which implies a peripheral location away from urban centres in accordance with the Christaller model used. However, young peoples' participation in upper secondary education (and VET) does not correspond to this model, as also noted by KTL (p. 120). Some peripheral municipalities rank very high (including Hjørring), others rank very low on upper secondary education completion rates. This very high variation between different peripheral municipalities would have been very relevant to take into account in the selection of cases for the comparative study of municipalities ('*maximum variation sampling*'). As the dissertation does not considered this, it misses an opportunity to throw light on a very strong spatial variation in educational transitions, which does not fit with the centre-periphery model used.

Regarding the selection of students, the growing average age of students in VET (average completion age is 28 years) questions the selection of students for interviews (17-21 years). The study does not consider the shift in recruitment to VET, where more than half of the new students are above 20 years and more than one third above 25 Years.

The dissertation has a strong research design, which is interdisciplinary and multi-methodological and therefore well suited for the explorative purpose of the study. It could have chosen a more systematically integrated design, either by selecting the interview persons based on patterns identified in the register-based studies, or reversely by using hypotheses generated from the interviews to structure the quantitative studies. This last approach could for example have been used to verify the interesting socioeconomic patterns found through the interviews. However, it must be acknowledged that this kind of sequential approach is difficult to realise within the time limits of a single doctoral research project.

The conclusions follow the structure of the dissertation as a whole, reviewing the results of the different analyses. It is valuable that the conclusion also point out a number of well-founded recommendations for further policy to combat the problems the research has identified.

Conclusion

The overall impression of the thesis is that the work done by Karin Topsø Larsen contributes to the understanding of the overall research question about the geography of vocational education.

Throughout the thesis, she delivers some interesting analyses. The work done demonstrates a thorough understanding of the complexities of the geography of vocational education.

In her manuscript for the dissertation Karin Topsø Larsen has developed a theoretical basis for her research. It documents a broad knowledge of the relevant literature and proficient choice and good application of appropriate scientific methods.

On May 4th 2017 Karin Topsø Larsen gave a public lecture with the same title as her thesis. Professor Susse Georg chaired the session, which was attended by more than 29 participants.

In the lecture, Karin Topsø Larsen gave a well-prepared account of her dissertation and exhibited extensive knowledge of the work she has done. During the oral defence, she also demonstrated ability to engage in a reflective discussion of her theory, methods and findings to the assessment committee's full satisfaction.

On the basis of the given account of her Ph.D. studies, description and assessment of her thesis it is recommended that the Ph.D. degree be conferred on Karin Topsø Larsen.

Gry Paulgaard
Professor
The Arctic University
of Norway

Christian Helms Jørgensen
Professor
Roskilde University

Lars Bo Henriksen
Professor
Aalborg University
(chairman)

Det Teknisk-Naturvidenskabelige Fakultet
Forskerskolen
Niels Jernes Vej 10

Dato: 21-03-2017

Vedr. "Developing Requisite Motivation in Engineering Studies. A study on a Master and Bachelor Program in Electronic Engineering at Uppsala University", by Kjell Staffas, Institut for Planlægning

Hermed fremsendes bedømmelsesudvalgets Final Assessment vedr. ovennævnte ph.d. afhandling.

Instituttet anbefaler, at bedømmelsesudvalgets indstilling følges, og at Kjell Staffas tildeles ph.d. graden.

Med venlig hilsen

Marianne Sørensen

AALBORG UNIVERSITY
DENMARK

Assessment of the PhD thesis entitled:

Developing Requisite Motivation in Engineering Studies. A study on a Master and Bachelor Program in Electronic Engineering at Uppsala University.

Submitted by Kjell Staffas, M.Sc.

The assessment committee consists of the following members as decided by the Dean of the Faculty of Engineering and Science by 1st January 2017:

- Member 1: Professor, Dr. Jonte Bernhard, Linköping University, jonte.bernhard@liu.se
- Member 2: Professor, Dr. Ralph Dreher, Siegen University, dreher.tvd@uni-siegen.de
- Member 3 (chairman): Associate Professor, Dr. Lars Botin, Aalborg University, botin@plan.aau.dk

Supervisor for the thesis has been Professor, Dr. Erik de Graaf, Aalborg University

Co-supervisor for the thesis has been Bettina Dahl Søndergaard, Aalborg University

Description of the thesis

The thesis consists of four scientific papers written by the author alone and 128 pages covering theory, methodology, summary and reference list. There are 46 pages of appendices on interviews, questionnaires and self-evaluation.

- Paper 1: Experiences from a change to student active teaching in deductive environment: actions and reactions
- Paper 2: Active leaning in a deductive environment – what to consider to increase motivation and conceptual learning
- Paper 3: Teaching and learning considerations for a research-intensive university implementing active learning.
- Paper 4: Heuristic for learning Common Emitter amplification with bipolar transistors.

Assessment of the thesis

Chapters 1-2

The candidate gives in his forewords a very personal motivation to work on this topic and develops a great number of Research Questions in Chapter 1 (26pp).

The candidate has a very personal approach to theoretical framework, methodology and how research questions can guide the research as such. This is very unlike 'normal' scientific procedure, but it is clear that the candidate has chosen to do so on purpose. It is although the question how the students will manage this style of learning and competence-development. Will they have a precise idea about the learning supporting-system that students really need?

Looking to this meta- question of the thesis, it seems absolutely right, that the candidate plan a mix from quantitative methods and qualitative interviews, to compare the performance of the students in different Learning-arrangements and their feeling of interaction with the teacher.

The candidate reflects in a very detailed way upon the theories of the learning psychology. He justifies this with the meaning of Creswell, that a mixed method needs a connection to an established model of theory to understand (and to interpret) the results of the research (32p).

In the following, the candidate is using the several theories to give a multi-perspective reason for PBL as standard-model in engineering education.

It is the question whether this very personal and multi-perspective approach to theory will facilitate teaching and learning in engineering education. The candidate tries to respond to this question in chapter 6-9, even though we find that the findings and results could be more convincing.

Looking at the whole thesis, the fruitful work of the author becomes clear. He is able to make comparisons between different classes with the same learning-content, with more or less learner-centered methods. He also uses the technique of the interview in a qualified way in order to uncover the students meaning about the learning-arrangement and their arguments for and against PBL-oriented learning. These results will make it possible in future, to understand more of the interaction-process during a PBL-Project.

In Chapter 10 (186ff), the candidate tries to resume his results as guidance for teacher. This is a useful result, but the connection to the previous chapters (6 -9), where he explains different detailed results, could have been stronger. Chapter 10 reflects the again the very personal and 'unusual' scientific approach that the thesis represents.

In sum, the candidate shows, that he is able, to formulate a concrete problem and to develop a consistent concept of research-methodology. The question is whether his concept can generate scientific based results.

Chapter 3 is called "Inquires made 2013 – A pilot study". It is a very short chapter, but presents in a good way the changes made in a pilot study and the rationale for the changes. However, the chapter does not relate the changes made to any references motivating the changes made in relation to existing literature.

Chapter 4 is called "The confinement of the thesis". In this chapter we are lead through a rather personal account how the thesis was "born" in contact with various theories. The author describes how his views on (deep) learning and teaching have evolved in contact with for example Bloom's original and revised taxonomies, the work of Marton, conceptual and procedural knowledge and finally theories on how student engagement and motivation is promoted through the learning environment. In contrast to the previous chapter this chapter engage with existing literature and is rich in references. It had been of greater value if the author had made this chapters' relationship to the research questions and the published papers clearer.

Chapter 5 is called "Methodology". The chapter starts with an interesting and more philosophical reflection about objective and subjective knowledge in relation with the views of various theorists. Later in the chapter the author discusses his research design in the context of the philosophical world views that were discussed earlier in the chapter. The strengths and weaknesses of quantitative, qualitative and mixed methods are reflected upon. Kolb's learning cycle is related to the research and design as the author's course development can be described as action research. Indeed, the author relates his methodology to action research but also anchors his research as a narrative inquiry. In this narrative description Kjell Staffas' background as a practitioner is clearly visible as the connection between the thesis as a narrative, what is done in the classroom, and theories and findings presented in the research literature are thoroughly and well discussed. At the same time, as in the previous chapter, the relationship between the methodology and the research questions could have been more explicit.

Chapter 6-9

The thesis encloses four scientific papers of which three are conference papers and the latter a paper for the European Journal of Engineering Education (EJEE). The conference papers reflect to a high degree what is discussed in the theoretical and methodological part of the thesis, emphasizing the importance of pragmatism, narratives and change-oriented approaches in order to enhance learning, although the links between the conceptual and methodological part of the thesis (chapter 2-5) and the research questions could have been stronger and more explicit.

The paper for EJEE addresses Blooms taxonomy as framework for improving learning in higher engineering education. The author suggests a classical top-down learning model, this in order to break down the taxonomy in congestive parts that makes it so that students are able to *understand* and *apply* their learning in complex technical matters. It is not totally clear how this should be made in practice, which means that there are some missing linkages to the model on conceptualizations and procedures in chapter 10.

Chapter 10

The thesis ends with a short summary wherein is stated that 'the teacher is useless' and it is not what is taught, but what is learned that matters. The 'teacher' has to focus on relations, contact and constantly consider the positioning of students in relation to knowledge and experience. What do they know and which experiences do they have? The summary ends up in a suggestion for a 'model' for how to reach, through iterations, the understanding and the application of new concepts and new knowledge. This 'model' points directly at the 'teacher' and what he/she ought to do in order to get there.

These very fruitful recommendations could have been supported in a stronger and more qualified way.

Overall assessment

The overall impression of the thesis is that the work done by Kjell Staffas is contributing to a practice based and narrative approach to research in learning environments and how personal interpretations of PBL can be applied in engineering education. The author relies and reflects on a variety of mainly pragmatic philosophical entries to learning and practice with a focus on John Dewey and in doing this he assures to some degree the theoretical foundation of his studies and findings. It can be discussed whether the personal and phenomenological approach to practice should be grounded more firmly in exactly phenomenology or similar subjective/inter-subjective theoretical and philosophical perspectives.

Oral presentation and discussion:

Date and place of the presentation: Skibbrogade, 9000 Aalborg. 15th March 2017

Kjell Staffas gave a clear and well-structured presentation, which elaborated on some of the main issues and findings in the thesis. In the following discussion Kjell Staffas responded in a satisfying way to the questions raised by the Assessment committee.

Conclusion:

Kjell Staffas has written a comprehensive PhD thesis addressing the problem of developing requisite motivation of engineering students and explaining a role model of teaching with the cornerstones of supporting, discussing and moderating. In his work he has presented narrativity as an approach to produce meaning and understanding in reflective and self-reflective stances and situations, where PBL is the turning point.

Kjell Staffas satisfactory presented and defended his thesis with the special topic of using narrative methods at the oral defense.

The Assessment Committee unanimously recommends that Kjell Staffas is awarded the PhD degree.

Dated and signed by all members of the committee.

Jonte Bernhard   Ralph Dreher   Lars Botin (chairman)

Til Forskerskolen
Att.: Lisbeth Diinhoff
N.J. 10

Vedrørende tildeling af ph.d.-grad til Lucas Chavarria Giménez

Institut for Elektroniske Systemer indstiller at bedømmelsesudvalgets indstilling følges således at Lucas Chavarria Giménez tildeles ph.d.-graden for sin ph.d.-afhandling "Mobility Management for Cellular Networks: From LTE Towards 5G" d. 05.04.2017.

Professor Preben Mogensen har været hovedvejleder for Lucas Chavarria Giménez.

Med venlig hilsen

Børge Lindberg

Institutleder

Assessment of the PhD thesis entitled:

Mobility Management for Cellular Networks: From LTE Towards 5G

Submitted by Lucas Chavarría Giménez, M.Sc. in Mobile communications.

The assessment committee consists of the following members as decided by the Dean of the Faculty of Engineering and Science on Dec 21/2016:

- Member 1: Dr. Berna Sayrac, Orange Labs (France), berna.sayrac@orange.com
- Member 2: Assoc. Prof. Henrik Christiansen, Technical University of Denmark, DTU Fotonik, hich@fotonik.dtu.dk
- Member 3 (chairman): Prof. Hans-Peter Schwefel, Aalborg University, Department of Electronic Systems, hps@es.aau.dk

Supervisor for the thesis has been Prof. Preben E. Mogensen, Department of Electronic Systems, Aalborg University.
Co-supervisor for the thesis has been Prof. Klaus I. Pedersen, Department of Electronic Systems, Aalborg University.

Description of the thesis

The thesis of Lucas Gimenez analyzes the handover performance in cellular networks and discusses various approaches for handover performance improvement. The thesis is compiled as a collection of 8 papers in the main part and further 5 papers in an Appendix. The papers are logically grouped into different parts of the thesis, and each part is equipped with an introductory text that summarizes the contributions of these papers. The eight papers in the main part contain 6 published conference publications, one conference paper is accepted for publication, and one magazine paper in status submitted.

The main part of the thesis is structured into six parts: Part I introduces the scope of the thesis and describes the high-level methodology, which is motivating the subsequent structuring and sorting of the papers. Part II analyzes a set of field measurements of handover performance in existing 3G and 4G cellular networks and provides a comparison with simulation experiments (Papers A, B). Part III analyzes different variants of dual connectivity in simulation experiments (Papers C, D, E). Part IV proposes methods for handover enhancement and analyzes them in simulation experiments (Papers F, G, H). Part V summarizes the additional papers that are placed in the Appendix. Part VI provides an overall summary and outlook to future research.

The following papers constitute the main part of the thesis:

- Paper A: Lucas Chavarría Giménez, Simone Barbera, Michele Polignano, Klaus I. Pedersen, Jan Elling, Mads Sørensen. "Validation of Mobility Simulations via Measurement Drive Tests in an Operational Network", IEEE 81st Vehicular Technology Conference (VTC Spring). May 2015, pp. 1-5. PRINTED
- Paper B: Lucas Chavarría Giménez, Maria Carmela Cascino, Maria Stefan, Klaus I. Pedersen, Andrea F. Cattoni. "Mobility Performance in Slow- and High-Speed LTE Real Scenarios". IEEE 83rd Vehicular Technology Conference (VTC Spring). May 2016, pp. 1-5. PRINTED
- Paper C: Simone Barbera, Lucas Chavarría Giménez, Laura Luque Sánchez, Klaus I. Pedersen, Per Henrik Michaelsen. "Mobility Sensitivity Analysis for LTE-Advanced HetNet Deployments with Dual Connectivity", IEEE 81st Vehicular Technology Conference (VTC Spring). July 2015, pp. 1-5. PRINTED

- Paper D: Lucas Chavarría Giménez, Per Henrik Michaelsen, Klaus I. Pedersen, "Analysis of Data Interruption Time in an LTE Highway Scenario with Dual Connectivity", IEEE 83rd Vehicular Technology Conference (VTC Spring). May 2016, pp. 1-5. PRINTED
- Paper E: Lucas Chavarría Giménez, Per Henrik Michaelsen, Klaus I. Pedersen, "UE Autonomous in a High-Speed Scenario with Dual Connectivity", 27th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC). September 2016, pp. 1-5. PRINTED
- Paper F: Lucas Chavarría Giménez, Per Henrik Michaelsen, Klaus I. Pedersen, Troels E. Kolding, "Towards Zero Data Interruption Time with Enhanced Synchronous Handover", IEEE 82nd Vehicular Technology Conference (VTC Spring). Submitted for publication. 2017. ACCEPTED
- Paper G: Lucas Chavarría Giménez, Klaus I. Pedersen, Per Henrik Michaelsen, Preben E. Mogensen, "Mobility Enhancements from LTE towards 5G for High-Speed Scenarios", IEEE Wireless Communications Magazine. Submitted for publication. 2017. SUBMITTED
- Paper H: Lucas Chavarría Giménez, István Z. Kovács, Jeroen Wigard, Klaus I. Pedersen, "Throughput-Based Traffic Steering in LTEAdvanced HetNet Deployments", IEEE 82nd Vehicular Technology Conference (VTC Fall). September 2015, pp. 1-5. PRINTED

Assessment of the thesis

The thesis deals with a timely topic, which is of interest to the research community, standardization bodies as well as to industry for the development towards 5G mobile networks. It is structured as a collection of papers and an introduction.

The introduction is distributed across the six main parts of the thesis and serves as an overview of the papers in each chapter. Overall, the introduction is clearly written and gives a good overview of the included papers. The methodology has a clear focus on what was done, how it was done and what the outcome was. Generally, the results are obtained by a mix of system level simulations and measurements on live networks as well as through detailed latency analyses. The comparison of simulation results to measurement data from the live networks is a strength and also led to enhancement of the simulation methodology via inclusion of 3d maps. The simulation analysis provides a good number of interesting results that overall appear sound. The research work has resulted in a fair number of publications.

While the introduction serves the purpose to introduce the research papers, the novelty of the work and the extent of contributions beyond assessment results are not always made clear. The introduction does a solid job in outlining the results, but provides only limited attempts to synthesizing them in a clearly delimited problem statement and to provide a discussion of their implications. While work is clearly interesting to standardization, the actual contribution to e.g., 3GPP, is not made explicit. From a methodology point of view, the simulation setup could have been more thoroughly described and lessons learnt regarding the applied methodology could have deserved more emphasis.

The thesis contains in the main part eight papers, Papers A-H. Six of these papers are reviewed in the following; Paper A is not discussed by a review as its contribution is methodologically similar to Paper B, while addressing 3G networks as opposed to 4G networks in Paper B. Paper G is not reviewed in detail as it is a submitted magazine paper that has mainly summary character, so has a similar, but not as extensive, role as the thesis introduction.

Paper B: Paper B presents and discusses field measurements of hand-over delays in a live LTE network from drive-tests in an urban environment and from a high-way scenario with different speeds. The main results are the averages, median values and empiric cumulative distribution functions for handover preparation times and handover execution times. Furthermore, some of the configuration parameters of the deployed LTE network are obtained via inspection of the signaling messages and these are subsequently used to configure a simulation tool to reproduce the measurement scenario. The latter is however only described on high-level.

The results are practically interesting and the executed data processing methodology appears trustworthy. It is however not clear, to what extent the observed dependence on speed is statistically significant. The use of experimental measurement data from live LTE networks is a strength and the results motivate subsequent work

in the thesis and provide a set of possible realistic values for some of the important handover performance metrics in LTE.

Paper C: This paper presents a performance study of Dual Connectivity in certain mobility scenarios. The methodology used is system level simulations in generic 3GPP scenarios as well as site-specific cases with explicit 3D modeling of topographical features and radio propagation based on ray tracing.

The strength of the paper is that the methodology is very well explained - modeling assumptions and scenarios are clearly defined. The results compare mobility performance (e.g., ping-pong, Handover Failure) in the various scenarios and conclude that there is a large difference between the results from the generic scenarios and the site-specific ones.

Paper D: The paper studies the mobility performance of single and Dual Connectivity (DC) in Long Term Evolution (LTE) as defined by Release 12 of 3GPP standardization. The performance evaluations are carried out in terms of data interruption times and cell management operations by system-level simulations on a high-speed scenario where macro and small cells are deployed on separate frequency bands. The aim is to assess the capability of LTE Release 12 single and dual connectivity to satisfy the stringent latency requirements of the upcoming vehicular and time-critical services/applications. Simulation results show that single connectivity implies a high number of handover events causing an intolerable level of data interruption time (5%). As for DC, the performance depends on the choice of the user plane architecture: the Split Bearer (SB) architecture having a performance significantly better than the Secondary Cell Group (SCG) bearer architecture in terms of data interruption time (SB having 1% and SCG having about 7% of data interruption time).

The paper provides answers to a problem of significant practical relevance. Although the standardization of the LTE V2X feature is about to be finalized in Release 14 through the use of the sidelink (device-to-device links), the question of the usability of the Release 12 HetNet connectivity features for vehicular applications is still a valid one. The paper is very clearly written, its structure following a smooth comprehensible flow of ideas, statements and explanations. However, it is not evident to see what the novelty really is. The work seems to consist of implementing the *existing* mobility procedures of LTE Release 12 single and DC in a sophisticated system-level simulator and interpreting the obtained results. So although the paper addresses a currently important practical issue and draws very clear conclusions, the novelty with respect to the existing solutions should have been made clearer. It would also be of practical interest, if the impact of the considered schemes on the QoS/QoE for different services could be analyzed, since the HO data interruption can possibly be compensated in varying degrees by the different applications.

Paper E: This paper presents a simulation study of Dual Connectivity in a high-mobility (high-way) scenario. Specifically, it evaluates the potential benefits of using an UE autonomous mode instead of the normal network controlled mobility management. Based on a rather detailed modeling of the signaling messages in the two cases it compares the number of signaling messages required for cell management events. Moreover, it explores different strategies for implementing the UE autonomous mode and a new "moving window" strategy is proposed. The strengths of the paper is first of all that it investigates the number of signaling messages, that it combines a simulation study of a realistic (real) area with a fictitious small cell layer and moreover includes all relevant signaling messages. This serves as a good and unbiased comparison of the proposed scheme to the existing approaches.

Paper F: The paper proposes enhancements to the HandOver (HO) procedure in Long Term Evolution (LTE) for reducing the HO data interruption time in view of the zero HO data interruption required for the next generation radio access networks. First, a detailed analysis of the legacy LTE HO procedure is carried out by identifying each step and their typical latency values. The first proposed scheme, Synchronous Random Access (RA)-less HO, eliminates the synchronization and Timing Advance (TA) transmission steps of the HO execution phase. However, the reduction brought by this scheme to the HO data interruption time is limited only to 3.5ms (over 27ms). The second scheme is an enhanced version of the first one, which proposes an intelligent forwarding of the buffer data of the source cell towards the target cell. Although this scheme improves the HO data interruption time with respect to the first one, the HO data interruption time still exists and is non-zero. The third scheme, which is also

an enhancement of the first one, proposes to keep both links (with source and target cells) that overlap in time. Analysis results show that it is only this third scheme (make-before-break) that can achieve zero HO data interruption time, even under very low latency values for the HO steps.

The paper deals with an important problem of practical relevance and proposes enhancements to the existing legacy HO scheme in LTE. It is clearly written and fairly easy to follow. The results in terms of HO data interruption times give a good insight for the challenges of the upcoming 5G. However, it would be good to have also the metrics such as RLF and/or HO failure together with the HO times. Although having zero HO interruption time is desired, if it comes at the expense of a significant number of RLFs, this is not a desired situation. Sensitivity of the results to the choice of T remains an open issue. In addition, there are some points that are not very clear:

1. What is exactly the role of T in reducing the HO data interruption time for the synchronous RA-less HO? It seems that T just determines the time when the source cell stops sending data to the UE and starts sending data to the target cell, and this does not affect the HO data interruption time (which is determined by the HO reconfiguration time, X2 latency, RRC messaging, BS and UE processing times). From this perspective, a non-zero T seems only to increase the risk of RLF (with respect to the legacy LTE HO). It is also not clear why T is communicated to the UE and how this parameter is used by the UE in the synchronous RA-less HO.

2. How would the third scheme (synchronous make-before-break HO) work in the case of an *intra*-frequency HO? Since RF tuning would not be necessary in the case of an intra-frequency HO, would we still need a 2nd Rx chain? Is the 2nd Rx chain needed anyway because the UE reconfiguration implies interruption for both inter- and intra-frequency HOs?

3. The two parallel links (with the source and the target cell) in the synchronous make-before-break HO scheme seem to provide robustness/diversity but the gain in terms of HO data interruption time is not so evident.

Paper H: Paper H proposes and analyzes two algorithms that trigger handovers in order to optimize throughput. Both algorithms rely on measurements of received power by the UE and on the knowledge of the number of connected users in each cell. In addition, a seemingly static estimate of the resource utilization of the interfering cells is used to calculate the SINR (signal to noise and interference ratio) for each user and this SINR value is further used as input for a simple throughput model, assuming equal sharing between all users in one cell. The target cell with maximum estimated throughput and the one with second largest estimated throughput are then used as handover candidates. The first proposed algorithm always uses the target cell with highest throughput for each user; it therefore implements a greedy local heuristic, as it takes the decision for each user without considering the impact of such handover on the throughput of other users. The second scheme builds on top of the first one: it however inspects the resulting throughout sum of all users and in case of an overall throughput reduction, it splits the users in two classes: once class that benefited from the handover choice and a second that did not. The second class then instead will use the target cell with the second highest throughput, again checking whether the resulting sum of the newly computed throughput estimates will provide an increase as compared to the original case. Both algorithms are therefore heuristics that aim to find an allocation of users to cells that achieves the maximum sum of user throughput values. Simulation experiments of an LTE scenario with macro and pico cells and several hundreds of mobile UEs based on an existing simulation tool show that both schemes improve the average user throughput at the cost of an increased number of handovers. The second scheme thereby triggers less handovers but also leads to lower throughput enhancement.

The topic of the paper is relevant and the results appear valid. The proposed schemes use simple and therefore also practically implementable models for the throughput estimation. The practical approach to the choice/measurement of the parameter rho_k in Equation (H.1) however remains open. The two proposed heuristics are valid, while it would be interesting to get a deeper understanding of the occurrence/contribution of the different cases in Scheme 2 – e.g. is its main benefit already provided by the first 'if' comparison in the algorithm for Scheme 2? Some additional information on the simulation would also be useful, in particular with respect to the resulting handover delays and their impact on user throughput. The result that Scheme 2 achieves a lower average throughput as compared to Scheme 1 seems counter-intuitive and would benefit from more explanation.

Oral presentation and discussion

Date and place of the oral defence: Aalborg, April 5, 2017

The candidate gave an overview on his thesis work in a 45 minutes presentation followed by a 1:50 hour oral examination. In the presentation, the candidate clearly summarized the problem statement and main contributions of his thesis, while demonstrating excellent presentation skills. Both during the presentation and the oral exam, the candidate was evidently enjoying the presentation and discussions. He demonstrated detailed knowledge about the topics covered in the thesis as well as a high level view, positioning his thesis work in a larger context. Furthermore, he showed a clear understanding of the impact and delimitations of his thesis work.

The committee agreed that the performance of the candidate during the presentation and oral defense was extremely good.

Conclusions

The thesis of Lucas Gimenez treats an important and timely topic. It provides a set of interesting and novel evaluation results on handover performance in current cellular networks and regarding schemes for handover performance improvement, mastering a combination of different assessment methodologies. The presentation and the oral defense were extremely good.

The committee unanimously recommends that Lucas Chavarria Gimenez is awarded the PhD degree.

05/04/2017

5/4-2017

05/04/2017

Dr. Berna Sayrac

Assoc. Prof. Henrik Christiansen

Prof. Hans-Peter Schwefel

AALBORG UNIVERSITY
DENMARK

Department of Electronic Systems
Signal and Information Processing
Fredrik Bajers Vej 7, B4
DK-9220 Aalborg East
Denmark

Inge Marie Harksen
Section Administrator
Phone: +45 9940 8300
E-mail: imh@es.aau.dk

The Technical Doctoral School of IT and Design
Aalborg University
Niels Jernes Vej 10

Date: 31-03-2017

Conc.: Awarding the PhD Degree" Perception of Reverberation in Domestic and Automotive Environments", Neofytos Kaplanis, Department of Electronic Systems, Aalborg University

Please find attached the Final Assessment from the assessment committee regarding the defence of the PhD thesis " Perception of Reverberation in Domestic and Automotive Environments", which was defended 30th March 2017 in Aalborg.

The department recommends that Neofytos Kaplanis is awarded the PhD degree in respect with the recommendation of the assessment committee.

Best regards

Inge Marie Harksen

Assessment of the PhD thesis entitled:

"Perception of Reverberation in Domestic and Automotive Environments"

Submitted by Neofytos Kaplanis, M.Sc. in Music, Mind and Brain, Goldsmith College, University of London, UK

The assessment committee consists of the following members as decided by the Dean of the Faculty of Engineering and Science by June 20th, 2016:

- Member 1: Research engineer (HDR) at Orange Labs (Lannion, France), Rozenn Nicol, rozenn.nicol@orange.com

- Member 2: Professor and head of the Acoustics Group, Steven Leonardus Josephus Dimphina Elisabeth van de Par, Carl-von-Ossietzky University of Oldenburg, Germany, Steven.van.de.Par@uni-oldenburg.de

- Member 3 (chairman): Professor MSO Stefania Serafin, Aalborg University, Denmark, sts@create.aau.dk

Supervisor for the thesis has been Professor Søren Bech, Department of Electronic Systems, Aalborg University, sbe@es.aau.dk

Assistant co-supervisors have been Assoc. Prof. Toon van Waterschoot from KU Leuven, Belgium and Prof. Søren Holdt Jensen, Aalborg University.

Description of the thesis

The thesis (256 pages) mainly consists of a collection of 6 papers. An introduction (52 pages) gives the outline of PhD work.

- Paper 1: N. Kaplanis, S. Bech, S.H. Jensen, T. van Waterschoot, "Perception of Reverberation in Small Rooms: A Literature Study", Proc. 55th International Conference of Audio Engineering Society on Spatial Audio, Helsinki, Finland, August 2014.
- Paper 2: N. Kaplanis, S. Bech, S. Tervo, J. Pätynen, T. Lokki, T. van Waterschoot, and S.H. Jensen, "A Rapid Sensory Analysis Method for Perceptual Assessment of Automotive Audio", Journal of Audio Engineering Society, vol. 65, no. 1/2, 2017. Accepted.
- Paper 3: N. Kaplanis, S. Bech, S. Tervo, J. Pätynen, T. Lokki, T. van Waterschoot, and S.H. Jensen, "Perceptual Aspects of Reproduced Sound in Car Cabins", Journal of Acoustical Society of America, Accepted.
- Paper 4: N. Kaplanis, S. Bech, T. Lokki, T. van Waterschoot, and S.H. Jensen, "On the Perception and Preference of Reproduced Sound in Ordinary Listening Rooms", Journal of Acoustical Society of America, In peer-review.
- Paper 5: S. Tervo, J. Pätynen, N. Kaplanis, M. Lydolf, S.Bech, T. Lokki, "Spatial Analysis and Synthesis of Car Audio System and Car Cabin Acoustics with a Compact Microphone Array", Journal of Audio Engineering Society, vol. 63, no. 11, pp. 914-925, 2016.
- Paper 6: N. Kaplanis, S. Bech, S. Tervo, J. Pätynen, T. Lokki, T. van Waterschoot, and S.H. Jensen, "A method for Perceptual Assessment of Automotive Audio Systems", Proceedings 60th International Conference of Audio Engineering Society on Dereverberation of Audio, Music, and Speech (DREAMS), Leuven, Belgium, February 2016.

Assessment of the thesis

This PhD thesis addresses the problem of making perceptual assessments of reverberant enclosures specifically focusing on normal size rooms for audio reproductions as well as within a car environment. In addition, it provides methodologies to link perceived attributes of the rooms to their acoustical / physical properties. The research is very relevant because it accomplishes the link between perception and room acoustical properties allowing for a more directed way to optimize a specific room or a car interior. The important contribution of this PhD thesis is that a comprehensive method is developed that allows for a small team of assessors to perceptually evaluate the simulated acoustical properties of rooms or cars interiors and link a set of emerging perceptual attributes to specific physical room properties. The method that is presented has a number of important properties:

- It allows to make recordings of environments that can faithfully be reproduced in a laboratory setting. This allows the assessors to quickly compare between different recording environments in order to make accurate comparative perceptual assessments of various attributes. This faithful reproduction (Spatial Decomposition Method) is an extension of an already existing method, but has been improved in a collaborative project to be applicable to the car environment also. The extension is crucial for the general applicability of this method.
- A method known in the food industry (Rapid Sensory Analysis) has been adopted for the acoustical evaluation of rooms. It is a method that requires no prior decisions about perceptual attributes that will be evaluated and allows to do this within a limited amount of time for each of the assessors requiring also only a small group of assessors to obtain reliable results.
- A study with two cases is shown that provides good support that the presented assessment method can indeed be used to obtain reliable and meaningful results in the context of evaluating acoustics of car interiors and of rooms. It demonstrates that this method can work for acoustical evaluations and it provides a range of analysis methods. This is important because it demonstrates the validity of this very convenient and effective evaluation method.

The PhD thesis of Neofytos Kaplanis presents innovative tools and studies about the physical and perceptual assessment of reverberation in the specific case of car cabins and small rooms representative of domestic listening experience. Focusing on these acoustic environments is both original and relevant: whereas reverberation is generally studied for concert halls, the most common listening condition of mass market experience is rather car or home environnment. What's more car cabins and small rooms raise challenging issues.

The main contributions of Neofytos Kaplanis PhD work are :

- a method specifically designed for the perceptual assessment of the reverberation of car cabins and domestic environments, comprising the following elements:
  - acoustic measurement of real soundfields by a microphone array (Spatial Decomposition Method – SDM – paradigm)
  - sound reproduction of these soundfields in laboratory environments with special care to preserve the time and spatial properties of the sound components (direct sound and reflections), also following the SDM paradigm
  - perceptual assessment by a panel of expert listeners and based on a rapid variant of sensory analysis (ie. FP or Flash Profile)
  - multi-dimensional analysis of both the acoustical measurement and the perceptual assessment to identify the physical descriptors and the perceptual attributes which are representative of the perception of reverberation in car cabins and domestic environments,
- a series of experiments in which the previous method is implemented and its validity is examined both for car cabins and domestic environments,

- proposal of a set of perceptual attributes which describe the perception of reverberation in car cabins and domestic environments.

The PhD thesis is composed of three large parts. Part 1 provides a comprehensive introduction to the topic matter, systematically addressing the various aspects of the problem of room acoustical evaluation, properly referring to existing methods and highlighting their strengths, but also limitations which motivate the research presented in this thesis. Parts 2 and 3 consist of a collection of papers. In Part 2, the contributions that are first-authored by Neofytos Kaplanis are presented, in Part 3, two further papers are presented on one of these Neofytos is coauthor, the other paper was presented at a conference and covers partially similar material as included in Part 2. Part 2 is composed of one conference paper, two accepted papers for the J. Audio Eng. Soc. and the J. Acoust. Soc. Am. Furthermore, one paper is under review for the J. Acoust. Soc. Am. The acceptance of already two papers for peer renowned reviewed journals supports the scientific merits of this PhD thesis. In addition to this, a co-authored paper (in part 3) has been published in the J. Audio Eng. Soc.

Paper A provides a review and analysis of many perceptual attributes that have been discussed in literature with regard to room acoustics. The analysis is depicted in a diagram showing the interrelatedness of the various perceptual attributes. The overview and analysis that is provided is very insightful and definitely provides a service for the reader that is interested in room acoustical perception. From this work it appears that the case of "ordinary" small rooms, and more specifically the case of car and domestic environments have been poorly investigated up to now and call for appropriate methods.

Paper B first motivates the need for evaluation methods for the acoustics of car interiors. Then this paper describes the limitations of existing methodologies for the perceptual evaluation of the acoustical properties of car interiors. In situ methods are presented that have the obvious disadvantage of requiring to move the assessors between different environments. This paper presents the full evaluation method for the first time. The method includes several steps: acoustic measurement (or simulation) of the environment, reproduction of the soundfield, assessment by a panel of listeners. It introduces the Spatial Decomposition method for rendering the acoustics of a car interior in a laboratory setting to overcome the need for an in-situ assessment. In addition, the paper presents the Rapid Sensory Analysis protocol for obtaining the individual perceptual attributes in response to the different car environments. In the results various sensory profiles are shown, each separate for each assessor. This paper provides the basis for the two case studies that will follow which go into much more depth with regard to the analysis. In Paper B, the results that are presented are interesting, but lack the analysis that is presented later (for instance in Paper D) that allow to make clear interpretations of the results.

Paper C takes the methodology developed in Paper B and applies this to a more elaborate assessment of various car interiors. In the paper the full scope of the innovations that are presented in this PhD thesis become clear. Again the perceptual attributes, including the ranking of different conditions was individual for each assessor. Now in this paper a method is presented that allows find common underlying perceptual dimensions using discussing various methods, but focusing on the Multiple Factor Analysis (MFA). With this method a number of findings are established. First of all, it is shown that for the two dimensions that have been found as main factors, there is a systematic and mostly non-overlapping mapping of the different car interiors. This demonstrates that reliable findings can be obtained with this method despite the fact that individual attributes are underlying the analysis and despite the limited number of assessors that were used. A further analysis, links the series of provided attributes of the assessors with the underlying dimensions and maps these together with the different car interiors. Now the link between the car interiors and the perceptual attributes is established and allows to link physical properties of the car interior with perceived effects. In the reviewers opinion this paper is one of the strongest in this PhD thesis and is expected to have a significant impact on the field.

Paper D follows a similar approach as Paper C, but now focusing on more general room acoustics. Various of the previously developed ideas are pursued and an insightful set of results is found. The comparison between

the acoustic environments is led from three points of view: physical data (i.e., acoustic criteria representative of the acoustic quality of the rooms), perceptual assessment, and preference judgment. All these data provides 3 different (i.e., physical, sensory, hedonic) profiles of each room under assessment. Crossing these profiles gives a fruitful insight into the links between perception and the acoustical properties on the one side and the preference of reverberation on the other side. In room acoustical perception, various technical room acoustical parameters have been defined in the past. These technical parameters can now be compared to the perceptual attributes that are derived for the assessors evaluations. Various interesting patterns can be found, which are not always intuitive. For example, the perception of bass is related to technical parameters such as C50 and Direct-to-Reverberant Ratio. This may be a limitation due to the fact that only two underlying perceptual dimensions were used.

Paper E and F are supplementary papers, the first of which is an extension of the Spatial Decomposition Method towards car interiors with shorter reflective pathways, the second a conference paper that covers some material that is presented in Part 2.

All in all this PhD thesis provides an important contribution to the literature by providing a comprehensive, effective and efficient method for evaluating room acoustical properties. The PhD work is both quantitatively and qualitatively very impressive. The PhD manuscript is well written and organized. The research development (question(s) investigated and motivation for research, assumptions, methods, results) is clearly explicited. What is remarkable is the concern of Neofytos Kaplanis to draw the link between acoustics and perception. A point that will need further attention in the future is the extent to which the Spatial Decomposition Method provides a truly perceptual accurate reproduction of the recorded room characteristics. The PhD thesis is very insightful and the merit of the work is also supported by various journal publications.

Conclusions

The work that is presented in the PhD thesis of Neofytos Kaplanis is of high level. The work shows a deep understanding of the design and analysis of room acoustical experiments and in addition, also provides a rendering method to allow for a faithful reproduction in a laboratory environment.

The presentation of the thesis was clear and supported by helpful sonic demonstrations that facilitated the understanding of the research challenges and results. The candidate made a thoughtful careful selection of the presented topics out of the abundant material investigated.

Questions from the committee ranged from general methodological and theoretical questions to more specific technical clarifications of the content. During the questions' session, Neofytos demonstrated confidence and expertise in the topic of the thesis. Moreover he showed a strong understanding of both strengths and limitations of his research. The committee therefore recommends that Neofytos is awarded the title of Ph.D.

30-03-2017

Rozenn Nicol   Steven van de Par   Stefania Serafin

AALBORG UNIVERSITET

Institut for Planlægning
Vestre Havnepromenade 5, 1.
9000 Aalborg

Telefon: 9940 8809
Email: mars@plan.aau.dk

Det Teknisk-Naturvidenskabelige Fakultet
Forskerskolen
Niels Jernes Vej 10

Dato: 05-05-2017

Vedr. "Heating strategies in a renewable energy transition", by Rasmus Søggard Lund, Institut for Planlægning

Hermed fremsendes bedømmelsesudvalgets Final Assessment vedr. ovennævnte ph.d. afhandling.

Instituttet anbefaler, at bedømmelsesudvalgets indstilling følges, og at Rasmus Søggard Lund tildeles ph.d. graden.

Med venlig hilsen

Marianne Sørensen

Assessment of the PhD thesis entitled:

Heating strategies in a renewable energy transition

Submitted by Rasmus Søgaard Lund, M.Sc. Eng. in Sustainable Energy Planning and Management, Aalborg University.

The assessment committee consists of the following members as decided by the Dean of the Technical Faculty of IT and Design by March 17 2017:

- Member 1: Prof. Sven Werner, Halmstad University, Sweden, sven.werner@hh.se
- Member 2: Brian Ó Gallachóir, University College Cork, b.ogallachoir@ucc.ie
- Member 3 (chairman): Professor Poul Alberg Østergaard, Aalborg University, poul@plan.aau.dk

Supervisors for the thesis have been professor Brian Vad Mathiesen and Associate professor David Connolly (Assistant supervisor), both Aalborg University.

Description of the thesis
The thesis is a 146 page report written in English consisting of a synthesis report, five journal articles published during the ph.d. studies and one conference paper. These paper are

1. Lund R, Ilic DD, Trygg L. Socioeconomic potential for introducing largescale heat pumps in district heating in Denmark. J Clean Prod 2016;139:219–29..
2. Lund R, Mathiesen BV. Large combined heat and power plants in sustainable energy systems. Appl Energy 2015;142:389–95.
3. Lund R, Persson U. Mapping of potential heat sources for heat pumps for district heating in Denmark. Energy 2016;110:129–38.
4. Lund R, Mohammadi S. Choice of insulation standard for pipe networks in 4th generation district heating systems. Appl Therm Eng 2016;98:256–64.
5. Lund R, Dominkovic D, Mathiesen BV. Socioeconomic Consequences of Short-Term Decisions on Large Heat Pumps and Biomass Consumption for Heat Strategies in Denmark. 11th Conf. Sustain. Dev. Energy, Water Environ. Syst. – SDEWES Conf., Lisbon, Portugal: 2016.
6. Lund R, Østergaard DS, Yang X, Mathiesen BV. Comparison of Low temperature District Heating Concepts in a Long-Term Energy System Perspective. Int J Sustain Energy Plan Manag 2017;12:5–18.

These are described individually under the follow section header.

The main research question of the thesis is *How should district heating systems and technology be developed in the transition towards a 100% renewable energy supply to meet societal goals of low socioeconomic costs and a sustainable use of energy sources?* which is segregated into three supporting question dealing with 1) heat sources for district heating 2) demand reductions and 3) district heating supply and technology.

A short synthesis report provides the overall introduction to the research, the theoretical and methodological approach in the research and draws on results of the five journal articles and the one conference paper to provide a conclusion matching the developed research question.

Assessment of the thesis
In the article *Socioeconomic potential for introducing large-scale heat pumps in district heating in Denmark*, RSL and his two Swedish co-authors assess the feasibility of introducing large-scale heat pumps in the Danish district heating. The assessment is made by applying two different energy system analysis tools (EnergyPLAN and MODEST). The discrepancy between the results from the two model tools is not significant. This comparison approach is appropriate in order to verify the robustness of the modelling results. The annual socioeconomic

benefit with installations around 2000-4000 MW is estimated to be between 50 and 100 million euro during the coming decade. This suggested heat pump installation would outnumber the current Swedish installation of about 1200 MW, being the most extensive national installation worldwide.

In the article *Large combined heat and power plants in sustainable energy systems*, RSL and co-author investigates the role of CHP in future high-renewable energy systems. Based on hourly simulations using the EnergyPLAN model, CHP operation is assessed with a view to biomass use and total energy systems costs under optimal technical and optimal electricity market economic operation. This topic is very relevant for sustainable energy futures, and the application of hourly EnergyPLAN simulations is appropriate – although the societal total system costs approach does not capture whether the modelled plants will in fact be economically relevant for potential owners.

In the article *Mapping of potential heat sources for heat pumps for district heating in Denmark*, RSL and his Swedish co-author study eight categories of potential low temperature or ambient heat sources in Denmark. They include a detailed spatial analysis of these heat sources in relation to existing district heating systems. The conclusion is that 398 out of 403 identified networks have suitable heat sources in their vicinities. Sea water is suggested as the most likely heat source for large-scale heat pumps in Denmark. Internationally, both the first and this third article are scientifically unique, since Denmark appears to become an interesting testing ground for utilisation of excess wind power as driving input for large-scale heat pumps. This a pioneering work performed since the energy research community is lacking contemporary information about this heating alternative, except from the early Swedish installations in the 1980s.

In the article *Choice of insulation standard for pipe networks in 4th generation district heating systems*, RSL and co-author perform a solid two-stage analysis where they on the one hand investigate the effects from district heating pipe insulation standards on losses, and on the other hand investigate the energy system impacts of these using hourly EnergyPLAN simulations on high-renewable energy system. The key analysis is the weighing of additional district heating pipe costs against energy savings, which is a relevant issue when analyzing the role of district heating in the future. The two-stage analysis is a sound approach and is a good combination of two fields that are often not properly integrated in the energy systems analysis literature.

In the conference paper *Socioeconomic Consequences of Short-Term Decisions on Large Heat Pumps and Biomass Consumption for Heat Strategies in Denmark* RSL and co-authors assess the socioeconomic consequences of different technical alternatives in the short term for the heat and electricity sector in Denmark and recommend initiatives to support the most feasible development towards the long-term goal (100% renewable energy in 2050). The results show that there is a large potential for introduction of heat pumps in the Danish energy system and approximate the economic and fuel savings benefits. Quantifying the economics provides a very useful input into policy discussions surrounding heat pumps.

In the article *Comparison of Low-temperature District Heating Concepts in a Long-Term Energy System Perspective*, RSL and co-authors propose reduced temperature DH as a solution to adapt it to future renewable energy systems. This study compares three alternative concepts for DH temperature level taking into account the grid losses, production efficiencies and building requirements. The scenarios are modelled and analysed in EnergyPLAN and compared on primary energy supply and socioeconomic costs. The key contribution here is in analysing low temperature DH on a large scale energy system level from a societal point of view.

In the synthesis report, RSL develops the very relevant main research question based on a literature review of the field of heating in a renewable Danish energy system. RSL provides a good though brief introduction to the theoretical concepts Choice awareness and Radical Technology Change as well as to Smart Energy Systems. The choice of simulation tool could be better reflected and argued – i.e. by establishing criteria and comparing these to candidate modelling environments. The comparison to Modest does provide a more certain basis for selection, however it is not clear why Modest was chosen for comparison.

In Chapters 3-5, RSL synthesises the results of the papers though not in a very high degree of details. Drawing on the articles and the paper, only few key-results are presented and with little emphasis on or reflection on

why results are as indicated, what circumstances generated the results or whether the results are generally valid.

The thesis is concluded in a two-page conclusion.

All in all RSL addresses an important topic in his ph.d. thesis work – namely the role of heating in future renewable energy systems, which is supported by five peer-reviewed journal articles and a conference paper. RSL has a structured and solid approach to energy systems analyses and provides an important contribution to the field. At the same time however, the thesis also has weaknesses including:

- In the synthesis report and to some extent also in article/paper discussions and conclusions, there is little reflection on *why* and almost exclusively on *what*. That is to say, results are described but the behaviour of the system resulting in these results is not elaborated or reflected verbally.
- Likewise, reflection on the validity of the results and what circumstances that might impact results could have been elaborated much more – particularly in the synthesis report. A two page conclusion does not enable an author to properly reflect on results, validity, and perspectives.
- Choice of modelling environment could have been deliberated more thoroughly
- The thesis is somewhat mechanic in its understanding of energy systems with limited focus on the many other factors that influence the development of the heating sector.
- Some of the underlying assumptions (e.g. that wind turbines can readily provide system inertia and thereby contribute to frequency response) are overly simplified.
- The thesis contains a number of interesting and impotant findings for policy. A clear set of summary policy recommendations would have been useful.

These critical points do not however affect our general recommendation.

Oral presentation and discussion
Date and place of the oral defense: A C Meyers Vænge 15, Copenhagen, May3rd 2017

Rasmus Søgaard Lund gave a good, clear and well-structured presentation which elaborated on some of the main findings in thesis.

In the following discussion, he answered competently with very good responses to the comments, questions and issues raised by the Assessment Committee. Rasmus Søgaard Lund showed a very good ability to discuss and elaborate also on issues not directly addressed in the thesis.

Conclusions
Rasmus Søgaard Lund has written a relevant Ph.D. thesis addressing the technological challenges of the energy transition in the heating sector. The publication output from this thesis was impressive.

In his work, Rasmus Søgaard Lund has presented both relevant and interesting angles on the transition and performed methodologically and theoretically sound analyses.

Rasmus Søgaard Lund competently presented and defended his work at the oral defense.

The committee therefore unanimously recommends that Rasmus Søgaard Lund is awarded the PhD degree.

May 3rd 2017

Sven Werner   Brian Ó Gallachóir   Poul Alberg Østergaard

AALBORG UNIVERSITY
DENMARK

Department of Architecture,
Design and Media Technology
Rendsburggade 14
9000 Aalborg
Denmark

Contact person:
Lisbeth Dam
Phone: +45 9940 3603
E-mail: ldam@create.aau.dk

Date: 19-04-2017

Det Tekniske Fakultet for IT og Design
Niels Jernes Vej 10
Att.: Bettina Wedde

Tina Vestermann Olsen

Hermed fremsendes bedømmelsesudvalgets indstilling vedr. Tina Vestermann Olsens ph.d. afhandling, som hun forsvarede fredag den 23. marts. Af indstillingen fremgår, at bedømmelsesudvalget anbefaler, at Tina Vestermann Olsen bliver tildelt ph.d.-graden.

Instituttet indstiller hermed tildeling af ph.d.-graden til Tina Vestermann Olsen .

Med venlig hilsen

Lisbeth Dam

Bilag

Aalborg 23.03.2017

Assessment of PhD dissertation entitled:

Timely Uses
- a critical contribution to better practices of strategic and entrepreneurial temporary use

submitted by

Tina Vestermann Olsen,
MSc in Architecture and Design

Main supervisor: Lea Louise Holst Lauersen, Aalborg University
Assistant supervisor: Ole B. Jensen, Aalborg University

The assessment committee consists of the following members, as decided by the Dean of Engineering and Science:

Professor Panu Lehtovuori, Tampere University of Technology;
Associate Professor Kristine Samson, Roskilde University;
Professor Hans Kiib, Aalborg University (chair).

1. Summary of the Dissertation

Research aim

The aim of Tina Vestermann Olsen's dissertation is to investigate municipal practices in relation to temporary uses, as they are increasingly implemented in urban transformation processes. The focus of the research is the practice of Aalborg Municipality, which has since 2007 experimentated with temporary tools in urban development. The thesis describes these processes over time, acknowledging potentials and barriers, successes and failures.

The research aims to reveal existing municipal practices and seeks to define 'better practices', using temporary use in relation to urban transformation, balancing different interests both inside the municipal structure and amongst public, private and civic stakeholders.

The empirical material comprises case studies of real-life transformation processes in the northern European context. The primary case consists of the two transformation processes in Aalborg Municipality. Four reference cases are from Århus, Copenhagen, Amsterdam and Helsinki. In the research, theoretic themes of transformation-related time, space and place, temporary uses as a phenomenon in urban transformation processes, as well as urban entrepreneurship are all consulted.

Structure of the dissertation

The dissertation is divided into three parts:

Part 1. Framework, including
- introduction to the subject,
- the ontology of the practices of temporary uses,
- theories related to temporary use as events affecting and transforming places and people,
- theories related to the practice of temporary uses in relation to planning,
- the relation between temporary uses and entrepreneurship,
- applied methodology and tools in the case studies.

Part 2. Empirical material – situated narratives, including

- learnings from the four reference cases in Aarhus, Copenhagen, Helsinki and Amsterdam
- in detail analysis of the main cases in Aalborg: Østre Havn and Karolinelund
- findings and themes summarized from the case studies

Part 3. Designed Places
- a comprehensive listing of the findings
- a model for understanding the processes of timely uses and how municipalities can improve their engagement in this field.
- suggestions to further research

The thesis has a list of four publications / articles published by the author during her PhD education and a long list of 15 appendices referring to digital material e.g. different timelines of the case developments, interviews, plans and site analysis of the main cases.

Research questions

Based on the theoretical framework, Tina Vestermann Olsen (TVO) formulates her research questions as follows:
- The first research question is - 'How are temporary uses practiced within the municipality, case Aalborg?' According to TVO it stems from the ambition to go into depth and seek out the practices that enable temporary uses to unfold within a complex reality, and along the way transform that reality.
- The second research question - 'Which relation exists between 'temporary use' and 'entrepreneurship' in urban design transformation processes' - directly seeks out a particular and potential relation to entrepreneurship, which is believed to bring forward a deeper understanding of temporary uses.
- Finally, the third research question - 'How can a strategic entrepreneurial minded 'temporary use' be better enacted in a Danish municipality, case Aalborg?' - aims to suggest ways forward towards better practices. As such, this represents a clear future perspective and also includes normative connotations (page 23)

Theory

The theoretical chapter 3, 4 and 5 focus on three different themes related to temporary use: The time related dynamics in the development of urban spaces, a theoretical understanding of the practice of temporary uses in relation to different planning theory, and finally a theoretical reflection of temporary use as an element of urban entrepreneurship.

Chapter 3 entails an unfolding of understandings related to space, site, place and time, developing a model of a complex 'reality of becoming'. It reflects the temporality and temporal use in an urban context as a general phenomenon related to an economic activity in market driven society.

Chapter 4 outlines how temporary uses are to be understood in relation to place making embedded within a participatory planning paradigm. The chapter contains two sections, theorizing and enacting the theme of temporary uses in relation to critical urban practices and discussing contemporary planning approaches, such as collaborative and user-driven planning in the context of new public management and neo-liberalism.

Chapter 5 argues that temporary uses can be seen as acts of urban entrepreneurship, containing entrepreneurial motives of both economic and social character. It proposes that acts of urban entrepreneurship may create architectural images as well as physical spaces, that can make a difference in development processes. The chapter advocates for the adoption of a broad understanding of entrepreneurship.

Methodology

In chapter 6, TVO develops a methodological approach for the empirical research. The chapter presents the chosen research design of a qualitative case-based study, comprising one main case and four reference cases. The case study approach entails closeness to the processes and practices of the agents in the cases analyzed. These practices are studied via qualitative interviews, on-site registration and mapping, document analysis, historical accounts and so called 'soft ethnography'. The ideas behind case study research are unfolded here, just as each method is explained one-by-one in terms of the knowledge it contributes and the modes of analysis.

Empirical analysis of subcases

Chapter 7 contains analysis of four reference cases: two Danish cases (Århus and Copenhagen) and two cases from northern Europe (Helsinki and Amsterdam). Each reference case is described through constructed phases, sectioning a diachronic timeline of development.

Chapter 8 provides a cross analysis of the four reference cases. The analysis foreground a range of points, which address specific learnings related to 'temporary use practices' and 'the relation between temporary use and entrepreneurship'. As such, the chapter works as intermediate step towards analyzing the main case.

Empirical analysis of the main case in Aalborg

Chapters 9, 10 and 11 provide a detailed analysis of two sites in the making, Østre Havn and Karolinelund, where temporary uses have been an ongoing activity, partly supported and guided by different municipal bodies, local landowners and developers.

Chapter 9 situates the temporary use practices of Aalborg Municipality into an overall context of policies and projects. The chapter opens with a description of the city as transforming into a cultural and educational stronghold in northern Jutland and briefly presents the two specific sites of inquiry as parts of this transformation. In addition, the municipal practices are traced over time, pointing to an increasing implementation of temporary use activities.

Chapters 10 and 11 unfold the main case of two processes from Aalborg: the transformation of respectively 'Østre Havn' and 'Karolinelund', each case entailing the strategic employment of temporary uses. The chapters include a reading in phases in which certain condensations of events are particularly interesting.

The case of 'Østre Havn' analyses transformation founded in a former industrial site owned since 2006 by a private developer. The planning for the transformation process has been on-going in a collaboration between the municipality and the developer, with temporary uses in parallel. By the end of 2016, the development of the area has gathered pace and many temporary use activities have come and gone, leaving only scarce traces in the area.

The case of 'Karolinelund' epitomizes a narrative of transformation via an inner-city park, previously a private amusement park since 2007 owned by the municipality. Throughout several years, the park has been filled with activities arranged and decided upon by local activist groups who were given the mandate by the municipality in no hurry to decide about the area's future. In this period, the park was labelled a 'folks park'. Since then, planning for the park has been reactivated and a range of the activities have been secured for the future transformation.

Conclusion and Perspectives

In the concluding Chapters 12 and 13, the thesis suggests not to use the term 'temporary use' but rather 'timely uses', referencing to the general processes transforming the physical and social life of the urban fabric. This entails understanding temporary use activities as a site- and time specific assemblage, increasingly professionalized and ripe with multiple underlying intentions, their rationales ranging from ideology to profit.

The research concludes that there is a strong relation to an entrepreneurial production of value. It addresses an entrepreneurial mindedness, which according to the author points to how short-term conditioning urges on entrepreneurial acts and creates intense periods of shared innovations within environments.

In order to answer the guiding research questions on 'How can strategic entrepreneurial minded 'temporary use', be better organized and enacted in Danish Municipality, case Aalborg', the thesis outlines parameters that constitute temporary use activities - from physical characteristics through non-physical conditioning. The conclusion includes a model describing the maturation and alternative scenarios of temporary use environments, including phases that may be related to specific challenges and potentials and, thus, require situated municipal practices as a support.

2. Assessment of the interaction between the different subparts of the dissertation.

The theme of the thesis is interesting and important to investigate. Tina Vestermann Olsen has been systematical in her work, which is mirrored in her presentation of her research, in her theoretical approach, in the used methods as well as in the analysis and findings.

The thesis is well structured, and TVO is concerned about explaining every step she takes very carefully using diagrams, summing ups and small introductions and referencing the process very well. Thus, TVO has achieved an academic overview over the state of art in her field in relation to themes, methods and her own approach.

The assessment committee finds that there is a balanced interaction between the theoretical chapter and the presentation of the empirical research. The research takes it starting point in cross disciplinary research discourse related to urban theory, theory on the transformation of space and place and theory related to entrepreneurial development. We find that the used categories and themes frame the gained knowledge in a productive way.

The overall research questions and the assemblage in the research design are the guiding light throughout the thesis and structurally, it is very coherent and precise. A main strength is the impressive empirical and theoretical material being orchestrated in the research design – the dissertation exceptionally well integrates research questions, ontology, epistemology, theory, methods and analysis. Clearly, the PhD manuscript is original and ambitious.

3. Assessment of the language of the dissertation

The monograph is written in English. The author's mastery of written English is at a very high academic level. Language is clear, yet personalized, and despite its length the structure helps the reader navigate through the text.

The empirical material – mappings, photos, citations from interviews – are continuously presented throughout the dissertation. Despite the thesis being well integrated on a structural

and discursive level, it could be argued that the thesis is too long and could have done without the extensive meta-communication. This is also the case for the more than 80 figures as they do not always reduce complexity, but rather open up new questions.

4. Assessment of hypothesis, theory and goals

The thesis covers a broad and relevant literature, both Danish and international. Throughout, the theoretical treatment is densely written and thoughtful. The hypothesis is not formulated directly, as such, but stems from a very interesting and relevant identification of the subject of the research.

The assessment committee finds that the dissertation convincingly constructs its own analytical tool for understanding the complex assemblages of temporary use. TVO clusters the various actors, bodies and spatial situation in three groups of 'hardware', 'orgware' and 'software'. The dynamics of the influence of the different bodies are wisely explained and modeled. Further, theories regarding time, rhythm and becoming are introduced to cover the time aspects of transformation processes. TVO's approach builds on the understanding that a certain place possesses a latent potential of becoming different, in a Bergsonian notion of change of its substance but always carrying the past within it. The hard, org, software model and complex, non-dualistic analytical frame is systematically used to make sense of the complex cases and their evolution, thus achieving the goals of thick description in adding understanding about temporary uses as a tool in municipal practices.

To summarize, the thesis offers impressive modulations of several academic disciplines, relevant for understanding the complex and heterogeneous field between temporary use and entrepreneurism.

Having said so the committee also finds that there is a lack of reference to more general theories of and research on power and power relations in postmodern urban developments. A deeper knowledge about power relations between competing cities in a neoliberal economical period of urban development may have revealed some determining structures in a market driven development. This could have included a discussion of the rationales related to dominating capital interests and rationales in new public management in municipal

government (from bureaucracy to network governance) and the change of modern planning from value-based 'blueprint planning' to network management and negotiation of interests.

In the thesis defence situation 23.3., TVO did not go deeper in the questions of power, but rather claimed that the pragmatist approach that foregrounds performativity on the micro-scale is efficient without structural concerns on power. The assessment committee doubts that, especially in the light of the cases that clearly show the difficulties and precariousness of temporary uses and actors in the face of economic and real-estate interests.

5. Assessment of methods and choice of cases

Considering the theoretical framings in the first chapters, in which for instance phronetic, situated and assembled knowledges are underlined, the task in chapter 6 is to construct a methodology welcoming the complexity and processual character of temporary use. Case studies, situational mappings, qualitative interviews, document analysis, auto-ethnography, participatory observation and narratives are all methods applied to answer the assemblage ontology proposed in chapter 2. In this perspective it makes perfectly sense to apply mixed methods.

The assemblage approach gives TVO the possibility to work with very different materials, which complement or provoke each other. Through discussions on the analyzed documents, photography, and shared activities, as well as interviews with planners, managers, developers, activists and inhabitants, she emerges as a good researcher. The methodological assemblages establish an original research design in which theory, method and analysis are integrated as dynamic components.

The strength is, that TVO argues extensively for the relevance, strength and weaknesses of each method. However, it is unclear if and how all methods are actively used in the end. For instance, the role of auto-ethnography and participatory observation are invisible in the case analysis, as diagrammatic and situational mapping, narratives based on qualitative interviews inform most of the written discourse. Here, participant observation and auto-ethnography could have contributed to a deeper and non-discursive understanding of for instance the time issues put forth in the beginning. – In the defence, the question whether visual methods and participatory observations could have revealed power structures was raised. Despite the

richness in methods it can be concluded that the applied methods lead to a rather descriptive rather than an analytical approach to the case material.

TVO selects 4 subcases and argues for them. They are all different, but unified by a strong municipal interest in temporary uses. So, from this point of view it is a good selection. However, the selection criteria are not quite clear. In the defence, TVO could somewhat clarify the choice.

TVO manages to weave together her own established themes and dilemmas in relation to temporary use and entrepreneurism with statements from activists, planners and developers. However, in regard to her methodology, it stands clear that the mappings, narratives and qualitative interviews are the analytical tools most frequently used. But one can ask how these analytical tools works as a non-representational knowledge production, as proposed in chapter 2.

We understand the figures as designerly elaborations of the empirical material – a way of making an overview of the complexity in the temporary use assemblages. While the figures clearly serve as an important part of the knowledge contribution, they also seem to establish a representation of the complexity rather than expressing the timely processes. Here one could raise the question what would have been put forth if TVO had let the case studies been narrated through for instance auto-ethnography and participatory observations.

6. Assessment of the case analysis

The case studies are well-written narratives in which TVO illustrates her communication skills as narrator. In general, TVO has been able to achieve a good and detailed description of sometimes very complex cases, with many and changing actors and partly non-documented information on processes. The cases are in themselves a valuable addition to the temporary uses literature.

Regarding cases, the committee would like to know more about policy mobility, i.e. cities and other actors learning from other places. Obviously, temporary uses are a broadly known debate and the idea has been spreading since late 1990s from Berlin and Dutch cases elsewhere. But it

would be good to know how analytic this learning has been in Aalborg and other places, and how TVO views her own role in this process.

Regarding entrepreneurship, we find that the role of municipal civil servants or politicians as 'community entrepreneurs' is not clear. TVO discusses in cases cities' many and conflictual roles. Clearly, cities have structural roles as public governors / regulators and as (semi)market-driven landowners and developers. They are also said to 'compete' nationally and internationally, but this rhetoric dimension of the 'entrepreneurial city' has been successfully challenged. Institutional change is certainly possible, and individual persons can act inside organizations to change them. But how does the links between 'community entrepreneur' and economic profits work out: who gains, how, and when. – Further, this leads us back to values and power: if we count also other than monetary values, what established decision making?

The choice of cases seems to lead to more or less the same conclusions around timing, the need for collaboration with municipalities and the relation between temporary use, entrepreneurship and the assemblage activities (p.183). E.g. the Papirøen activists are labeled 'activists tenants' whereas the Kalasatama activists works with public art (p. 137). Here we find, that a more elaborated understanding of what kind of activism temporary uses are, could have been useful – as entrepreneurial, artistic or even autonomous activism could be seen as rather divergent or even contradictory typologies.

The assessment committee finds that the dissertation lacks an elaborated understanding of 'activism'. Grass-root activism and autonomous activism could have designated another timely use in which power structures and constant negotiations between municipality and activists also play an important role. In the the defence this issue became clearer, in reference to other on-going research projects in Aalborg University.

7. Discussion of the results in the dissertation

This dissertation adapts an innovative approach to the study of temporary uses and the relation to the role of municipalities. TVO convincingly balances between metareflections on her own academic approach and a rich and multilayered empirical and practical investigation. The structure and academic architecture of the dissertation shows us that TVO is a mature researcher and an academic author.

The assessment committee finds that the impressive cross-disciplinary framework in the first part have framed the dissertation in a very positive way, but it may also have some redundancies. Whereas it stands clear what TVO uses to establish her own analytical approach and what is left behind in the initial framings, the assessment committee finds that many of initial cross-disciplinary relations established in the first part could have been revisited in the last part, 'Findings'.

Nevertheless, the reseach does achieve a valueable set of new understandings on temporary uses and municipalities' possibilities to use and support them, to achieve better results in urban projects. The evolutionary charting of temporary uses 'life-cycle' is interesting, even though it masks much of the real complexity of the field, as was approved by TVO in the defence. The rich and situated notion of time, as developed in the theory part, does not show in the results. The lacking focus on power weakens the applicability, as it remains unclear how novelties and innovations actually can influence urban development agendas.

8. Oral Presentation and discussion

The oral presentation was well structured and presented the key finding of the thesis as well as a broader discussion touching upon several of the issues mentioned in the preliminary assessment with relevant perspectives and reflections. At the oral presentation TVO, in a very convincing and professional manner, demonstrated the ability to apply theories on timely uses onto the empirical data and there through contribute to knowledge making on how municipalities cope with temporal uses in relation to urban transformation.

Tina Vestermann Olsen is very familiar with her material and in the subsequent discussion she could respond very open-mindedly and thoughtfully to most of the questions posted by the assessment committee and throughout the discussion Tina Vestermann Olsen excellently demonstrated the ability to participate in an academic discussion.

9. Concluding remarks

The overall assessment is that the dissertation is a very mature piece of work that is well written and well argued. It stands as an important contribution to the merging field of temporal uses in urban planning

Overall the thesis, the oral presentation and the following discussion express a very thoroughly conducted research contribution. Tina Vestermann Olsen has developed an interesting and original work with a solid and genuine research approach that demonstrates a good mastering of the theoretical, methodological and analytical aspects of doing PhD research.

Based on the evaluation of the thesis, the oral presentation and the discussion, it is the evaluation of the assessment committee that Tina Vestermann Olsen meets international standards for a Ph.D. The assessment committee therefore unanimously recommend to the Academic Council that the thesis is accepted as qualifying Tina Vestermann Olsen for a Ph.D. degree.

Date: 23.03.2017

Signature:

Professor Hans Kiib, Aalborg University (chair)

Professor Panu Lehtovuori, Tampere University of Technology

Associate Professor Kristine Samson, Roskilde University

AALBORG UNIVERSITET

Cassiopeia
House of Computer Science

Institut for Datalogi
Selma Lagerlöfs Vej 300
9220 Aalborg
Tlf. 9635 8080
Fax 9635 9798
i16@cs.aau.dk
www.cs.aau.dk

Institutleder
Kristian G. Olesen
Tlf. 9635 9852

Sagsbehandler
Helle Schroll
Tlf. 9635 8852

Det Teknisk Naturvidenskabelige Fakultet
Forskerskolen
Njv 10

Att.: Bettina Wedde

30. marts 2017

Ph.d.- forsvar Zhengkui Zhang

Vedlagt fremsendes underskrevet indstilling for Zhengkui Zhang, som forsvarede sin afhandling den 28. marts 2017 på SL 300.

Best regards,

Helle Schroll

Assessment

AALBORG UNIVERSITY
DENMARK

Assessment of the PhD thesis entitled:

Time and Cost Optimization of Cyber-Physical Systems by Distributed Reachability Analysis

Submitted by Zhengkui Zhang, Master of Science

The assessment committee consists of the following members as decided by the Dean of the Faculty of Engineering and Science by January 9, 2017:

- Associate Professor Bernhard Klaus Aichernig, Institute of Software Technology, Graz University of Technology (aichernig@ist.tugraz.at)
- Senior Researcher Radu Mateescu, INRIA Grenoble – Rhône-Alpes / CONVECS Inovallée (radu.mateescu@inria.fr)
- Associate Professor Josva Kleist (chairman), Department of Computer Science, Aalborg University (kleist@cs.aau.dk)

Supervisor for the thesis has been Professor Kim Guldstrand Larsen, Department of Computer Science, Aalborg University.

Co-supervisor for the thesis has been Associate Professor Brian Nielsen, Department of Computer Science, Aalborg University

Description of the thesis

The thesis consists of 4 research papers supplemented by an overview section and a section describing additional implementation details of some of the algorithms presented in the research papers. The thesis totals 146 pages plus English and Danish abstracts and table of contents.

The papers included in the thesis are:

A. *Time Optimal Reachability using Swarm Verification*. Zhengkui Zhang, Brian Nielsen, and Kim G. Larsen. In Proceedings of the 31st Annual ACM Symposium on Applied Computing, pages 1634–1640, ACM 2016.
B. *Distributed Algorithms for Time Optimal Reachability Analysis*. Zhengkui Zhang, Brian Nielsen, and Kim G. Larsen. In Proceedings of Formal Modeling and Analysis of Timed Systems - 14th International Conference FORMATS 2016, volume 9884 of Lecture Notes in Computer Science, pages 157–173, Springer 2016.
C. *Pareto Optimal Reachability Analysis for Simple Priced Timed Automata*. Zhengkui Zhang, Brian Nielsen, Kim G. Larsen, Gilles Nies, Marvin Stenger and Holger Hermanns. Under submission.
D. *Verification and Performance Evaluation of Timed Game Strategies*. Alexandre David, Huixing Fang, Kim G. Larsen and Zhengkui Zhang. In Proceedings of Formal Modeling and Analysis of Timed Systems - 12th International Conference, FORMATS 2014, volume 8711 of Lecture Notes in Computer Science, pages 100–114, Springer 2014.

Assessment of the thesis

The thesis contributes to the field of model-based engineering of real-time systems using formal methods and verification. The approach adopted is based on timed automata, a fundamental formalism for modelling and analyzing communicating concurrent systems that operate under time constraints. Several topics are considered, related mainly to scheduling, planning, and evaluating the performance of strategies synthesized under control objectives.

The first part of the thesis gives a comprehensive overview of the work, by describing the context and clearly stating the objectives. The problems to be solved are well motivated and formulated, and a review of the main results in the field is provided. The contributions are then presented in a succinct, high-level manner, with relevant references to the papers appended in Part III of the document. The first two contributions deal with parallelizing and distributing the computation of time optimal reachability, which provides solutions to scheduling and planning problems. The algorithms are carefully designed and their performance is assessed according to several relevant criteria. The third contribution concerns the computation of Pareto optimal schedules by using branch-and-bound exploration techniques of the symbolic state space of simple priced timed automata. Finally, the last contribution regards the integration of three different analysis techniques (synthesis of strategies, model checking, and statistical model checking) to assess the quality of strategies synthesized from timed games and given control objectives.

All the algorithms proposed were implemented on top of the widely-used UPPAAL model checker, and experimented on several case-studies (established benchmark examples and also real-life systems, such as nano-satellites).

The manuscript is clearly written, well-structured, and presents the results at the right level of abstraction. The objectives of the work were clearly met, as demonstrated by the publications and the operational implementations of the algorithms proposed. Several interesting perspectives of the work are also identified.

Strengths: Overall, the contributions of the thesis make significant steps forward on improving the capabilities of analyzing real-time systems modeled as timed automata networks and variants thereof.

In addition to the material related to the four papers, Part II of the thesis presents some intricate details of the implementation of the algorithms and integration to UPPAAL. In particular, the management of traces in the distributed setting is presented and illustrated in detail, which can be valuable also in other contexts (e.g., for managing traces of distributed algorithms).

Weaknesses: Regarding the parallelization of time optimal reachability, one might wish to see a comparison with classical parallelized UPPAAL model checking, e.g., the variant obtained by connection to LTSmin.

Paper A: Time Optimal Reachability using Swarm Verification

This paper deals with time optimal reachability (TOR) analysis for real-time systems using model checking techniques and parallelization. TOR provides an efficient way of synthesizing feasible schedules in real-time systems in terms of diagnostic traces (with minimal time cost) produced by model checking. To combat the state explosion problem, this paper investigates the parallelization scheme called swarm verification in the context of real-time systems described as networks of communicating timed automata in the UPPAAL model checker. Four swarm verification algorithms are proposed, built upon random depth-first search (RDFS) in a shared-memory and message-passing setting, and combinations thereof with breadth-first search (BFS) in a master-slave and agent-based setting. These algorithms have been implemented in UPPAAL, experimented on four realistic case-studies, and compared according to four relevant metrics (time to find/prove an optimal solution, time and memory consumption). The experiments revealed significant speed-ups of the swarm-based algorithms w.r.t. the sequential ones, and pointed out that the agent-based version of RDFS mixed with BFS has the lowest memory consumption, and hence the best potential for scalability. The paper is clearly written,

the algorithms are described in detail, and the experimental data are presented and commented rigorously. The contributions are relevant not only in the field of symbolic timed model checking, but also for other problems stated in terms of solution space exploration.

This paper was accepted at SAC 2016 which had a paper acceptance rate of 24%. This low acceptance rate is an indicator of a high-quality conference.

Relevance: Scalability of model checking to larger system models is a big challenge and every technique that targets this problem is highly relevant. One of these techniques is the researched swarm verification, where several instances of a model checker run in parallel with different search strategies. Hence, the presented results for the different search techniques are of high relevancy to the research community.

Novelty: Swarm verification is not new, but this is the first implementation and application that targets timed automata and UPPAAL. The main contribution of this paper are the results of a large set of experiments investigating four different swarm algorithms on four different models with hardware set-ups ranging from 1-512 cores. Furthermore, four different metrics were investigated. All these results are original. The most important related work has been cited.

Soundness: The presented techniques appear to be sound. The algorithms are presented in pseudo-code and seem to be correct. A sufficient set of different experiments support the conclusions drawn. Very importantly, each random algorithm was repeated 15 times for each setting.

Minor weak point: in addition to the median other measures would have been interesting, e.g. the minimum and maximum runtimes.

Presentation: The paper is very well structured, well written and easy to read. The algorithms, the experiments, the underlying hardware settings are all well defined such that there is no ambiguity in interpreting the results.

Conclusion: The extend of the experiments and the concise presentation of the results are impressive. The reader has the feeling that he has learnt something. The paper definitely satisfies the highest scientific standards in our community.

Paper B: Distributed Algorithms for Time Optimal Reachability Analysis

This paper proposes distributed algorithms for time optimal reachability (TOR) built on top of the UPPAAL model checker, with the goal of scaling up the capabilities of the tool by using the computing resources of clusters and grids of machines. Five distributed algorithms walking in the symbolic state space are proposed, two of them based on BFS (and its level-synchronized variant) and three on DFS (and its greedy and randomized variants). These algorithms were implemented on top of UPPAAL and experimented on the four case-studies considered in paper A. The performance measures were used to compare the algorithms according to four efficiency criteria (time to find the optimal result, time to prove it by exploring the whole state space, progression in improving the solution, and memory consumption / communication overhead). The experiments, carried out on a cluster, have shown that the distributed algorithms proposed can be much faster than sequential ones (especially the DFS variants) and can converge on large models when sequential ones fail. The experiments also pointed out the communication overhead of distributed algorithms, which could be reduced by devising distributed multi-core algorithms able to finely tune the overlap between computations and communications. Nevertheless, the results presented are globally positive, demonstrating the benefits one can expect from devising and carefully implementing distributed verification algorithms.

This paper was accepted at FORMATS 2016 which had a paper acceptance rate of 44% (the same as in 2014, see Paper D). This is quite high, but FORMATS is a specialised conference that uses to receive a lower number of high-quality submissions.

Relevance: This paper targets the same challenge as Paper A, the scalability of model checking timed

automata. The method is different as here the model checking algorithms themselves are adapted to distributed verification. As said before, this is highly relevant.

Novelty: To our knowledge this is the first attempt to distribute the verification of timed automata. Five new distributed algorithms for timed reachability analysis are presented. In contrast to swarm verification, these algorithms exchange explored states. A new version of UPPAAL has been created that implements these algorithms. The same models and metrics as in Paper A have been analysed. It is interesting to see the effects of communication overhead in large core settings. The relevant related work is cited.

Minor weak point: Multi-core shared memory techniques should have been investigated as in future we will see systems of 100-1000 cores on a single CPU.

Soundness: The presented techniques appear to be sound. The algorithms are presented in pseudo-code and seem to be correct. The experimental settings are convincing. In order to take the inherent non-determinism in distributed algorithms into account, every algorithm was repeated 10 times for each core setting. This seems to be sufficient.

Minor weak point: As in Paper A it would have been good to report the minimum and maximum runtimes.

Presentation: The paper is very well structured, well written and easy to read. The algorithms, the experiments, the underlying hardware settings are all well defined such that there is no ambiguity in interpreting the results.

Conclusion: As in Paper B, the extend of the experiments is very impressive. Five algorithms and the many experiments have been presented in a concise form while still communicating the techniques, the essential results and conclusions.

Paper C: Pareto Optimal Reachability Analysis for Simple Priced Timed Automata

This paper considers the generation of Pareto optimal multi-objective schedules for real-time systems using model checking techniques operating on (simple) priced timed automata. The approach works in two phases: the first one explores the symbolic state space and computes (using branch-and-bound techniques) the goal states in which all objectives reach their Pareto optimal values, and the second one computes diagnostic traces from the initial state to the goal states, from which Pareto optimal schedules can be derived. The approach was implemented on top of the UPPAAL model checker and experimented successfully on two real-life examples (a task scheduler system and the GOMX-3 Cubesat nano-satellite produced by Gomspace and operating in orbit). The results demonstrated the usefulness of the approach for synthesizing Pareto optimal schedules, which are of utmost importance for mission-critical systems operating under severe energy, cost, and availability constraints.

Relevance: This paper addresses the problem of optimising a reachability problem regarding several cost functions. Today, where energy consumption is a big issue and not only performance is relevant this is highly relevant. The presented work is very general. Pareto optimisation problems can be formulated as a reachability problem of simple priced timed automata giving the user maximal flexibility. An arbitrary number of costs can be optimised. Hence, it is possible to optimise for e.g. performance, energy consumption and memory consumption. Two realistic case studies show the feasibility of the approach.

Novelty: This paper presents novel contributions as follows: in contrast to the existing UPPAAL-Cora where a single cost can be optimised, UPPAAL is extended to calculate the Pareto-Front of a vector of cost functions. In addition, the first case study shows that this is an improvement compared to a previous study with UPPAAL-Cora. Finally, the power-aware scheduling of the GomX-3 nano satellite illustrates the solving of quite complex optimisation problems in space missions.

Soundness: The presented algorithms seem to be sound. The extensions of the classical model checking

algorithm are well motivated and precisely presented. It has been implemented and was applied in two non-trivial case studies.

Presentation: The paper illustrates the problem, the background theory, the algorithm as well as the two case studies very clearly. It is well structured and the results of the two case studies are well presented.

Conclusion: This paper is solid work that contributes to the important field of multi-value optimisation with formal models. This paper is under submission, but without any doubt it is ready for acceptance in a high-quality conference on this topic.

Paper D: Verification and Performance Evaluation of Timed Game Strategies

This paper combines three analysis techniques of real-time systems to exploit their cumulated benefits: taking as input the strategies derived using controller synthesis techniques for a timed game and a given control objective (as produced by UPPAAL-TIGA), additional properties are verified by model checking the timed game extended with the synthesized strategy. In addition, statistical model checking techniques are used to derive quantitative information about the synthesized strategy. This is done in two ways: the first one translates the strategy into a timed automaton further analysable by UPPAAL, and the second one consists of a new extension of UPPAAL, called Control-SMC, that automatically synthesizes a strategy, then verifies and evaluates it according to additional properties. The approach was experimented successfully on two case-studies (a job-shop and a train gate controller), and has shown a twofold improvement in performance of the UPPAAL SMC engine.

The paper was accepted at FORMATS 2014 which had a paper acceptance rate of 44%. This is quite high, but FORMATS is a specialised conference that uses to receive a lower number of high-quality submissions.

Relevance: Checking and analysis of synthesised strategies, i.e. controllers, is very interesting. The synthesis is based on classical timed game automata. By adding stochastic information in the form of clock rates a deeper and more realistic analysis of the strategy can be carried out. In addition, additional properties, e.g. energy consumption, can be analysed under a given strategy. The Train case-study shows that the synthesised strategy achieves higher throughput of trains while spending more energy. These results are an important step towards optimising strategies. The presented approach has been integrated into the new tool UPPAAL STRATEGO.

Novelty: At the time of publication this piece of work was novel. The contributions include, the idea itself, the two methods, i.e., manual translation and Control-SMC, the two case studies comparing the two methods and the comparison of a manual strategy to a synthesised control strategy in case-study 2.

Soundness: The two methods have been cross-checked in two case studies and showed the same results. The formal definitions are correct. The SMC algorithms are well-established and the chosen parameters, e.g. the confidence interval, are common and make sense.

Presentation: The paper is well structured and easy to read. A running example guides the reader through the method. The models and a more detailed description of the case studies is available online.

Conclusion: This is well-founded research that made it in the meanwhile into a tool of its own. Worth mentioning is the fact that the original idea and approach that needed manual translation was fully automated and showed an improved performance.

Oral presentation and discussion

Date and place of the oral defense: Aalborg University, March 28, 2017

The presentation highlighted significant parts of the dissertation, described the algorithms developed and illustrated through examples. The presentation was pedagogical at the right level of abstraction with good use of illustrations and well timed.

During the discussion Zhengkui Zhang answered the questions posed and showed confidence in the subject matter ranging from theory over implementation to application. Zhengkui Zhang is without a doubt able to perform a scientific discussion. The answers were illustrated by good use of blackboard drawings and even new research ideas could be discussed. Zhengkui Zhang showed his ability to reflect on his own work highlighting areas for future work but also understanding the challenges involved.

Conclusions

Based on the above assessment of the thesis and the defense it is unanimously recommended that Zhengkui Zhang is awarded the Ph.D. degree.

Aalborg, March 28, 2017

Bernhard Klaus Aichernig   Radu Mateescu   Josva Kleist

Dato: 05-05-2017

Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. tildeling af titlen adjungeret professor ved Institut for Elektroniske Systemer

Kandidat vedr. tildeling af titlen adjungeret professor:

JJ Vegas Olmos (tidl. lektor ved DTU og nu ansat ved Mellanox)

Bilag: Indstilling og CV

Bedømmelsesudvalg:

- Professor Knud Erik Skouby, Institut for Elektroniske Systemer, Aalborg Universitet
- Professor Preben Mogensen, Institut for Elektroniske Systemer, Aalborg Universitet
- Professor Joachim Oberhammer, Micro and Nanosystem, KTH

Bilag: CV for ekstern bedømmer

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AALBORG UNIVERSITET

Institut for Elektroniske Systemer
Fredrik Bajers Vej 7B
9220 Aalborg Ø
www.es.aau.dk

Dato: 8. maj 2017

Motivation for tilknytning af J.J. Vegas Olmos som adjungeret professor ved Institut for Elektroniske Systemer, sektionen Communication, Media and Information technologies (CMI)

Institut for Elektroniske Systemer skal hermed indstille, at JJ Vegas Olmos tilknyttes som adjungeret professor.

J.J. Vegas Olmos (JJVO, b.1978) har en bred/ tværfaglig akademisk baggrund med en PhD i Electrical Engineering; Master i Business Administration; Master I internationale studier samt en Master i Electronic Engineering; en Bachelor i økonomi og en Bachelor i Electrical Engineering,

Hans akademiske profil passer således fint ind I CMI's tværfaglige forskningsområde, hvor han har ytret interesse for at engagere sig – især i forskningssammenhæng, men også med bidrag til undervisningen.

Han har godt 15 års erhvervserfaring i både industrien og universitetsverdenen. Han er aktuelt ansat i firmaet Mellanox, hvor hans arbejdsområder omfatter nye arkitekturer og tjenester i 5G systemer samt avancerede IoT systemer.

Dette er områder, som CMI ønsker at udvikle og opdyrke, og det vurderes, at JJVO markant kan assistere i denne udvikling jf CV og litteraturliste. Han har desuden gode resultater i hjemtagning af EU-projekter og har udtrykt interesse i innovations- og start-op virksomheder i relation til CMI.

JJVO har undervisningserfaring fra forskellige universiteter.

Institutleder Børge Lindberg, tlf. +45 9940 8638, E-mail bli@es.aau.dk
Institutsekretær Kirsten Jensen, tlf. +45 9940 8650, E-mail krj@es.aau.dk

PERSONAL INFORMATION

Vegas Olmos, Juan Jose / Date of birth: April 29, 1978 (Barcelona) / Nationality: Spanish
Dept. Photonics Engineering, Technical University of Denmark
Ørsted Plads, Building 343, Kgs. Lyngby, 2800, Denmark, mobile: +45 71689644

Researcher ID: N-9336-2015   e-mail: jjvegasolmos@gmail.com

AIM

Looking to return to industry from a successful stint in academia in the area of photonics and optics for communications. With over 200 publications and three patents, I can move comfortably from technical and research work to project management and fundraising activities. I have brought growth and achieved the goals of my organizations for over thirteen years, always through good communication, loyalty and dedication.

EDUCATION

2006	**PhD in Electrical Engineering**, Supervised by Prof. Ton Koonen. Department of Electrical Engineering, Electro-Optical Communications, Eindhoven University of Technology, The Netherlands
2013	**Master in Business Administration** (MBA), UNED, Spain
2011	**Master in Arts, East Asian Studies**, Universitat Oberta de Catalunya, Spain
2005	**Bachelor in Economics**, Business Administration, Marketing, Universitat Oberta de Catalunya, Spain
2003	**Master in Electronic Engineering**, Technical University of Catalonia, Spain
2001	**Bachelor in Electrical Engineering**, Technical University of Catalonia, Spain

CURRENT POSITION

2013 –   **Associate Professor**, Dept. of Photonics Engineering, Technical University of Denmark

PREVIOUS POSITIONS

2011 – 2013   **Assistant Professor**, Dept. of Photonics Engineering, Technical University of Denmark
2008 – 2011   **Senior Researcher**, Hitachi Ltd., Central Research Laboratory, Japan
2006 – 2008   **Postdoctoral Researcher**, Osaka University, Dept. Electrical, Electronics and Information Engineering, Japan

FELLOWSHIPS

2003 – 2006   **Research Assistant**, Faculty of Electrical Engineering, Eindhoven University of Technology, The Netherlands

ACADEMIC TRAINING

2011 – 2012   Uddannelse DTU (DTU Training) – Pedagogical training and certificate to teach in higher education organizations in Denmark.
2012 – 2014   Management and Leadership. Inhouse program for selected key employees at DTU to promote to senior positions in Management within the Faculty. Special emphasis on networking, alignment of goals within the organization and fundraising/development.

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2011 –   2 Postdocs (K. Vilches, A. Jurado-Navas)/2 graduated PhD/12 ongoing PhD/Graduated over 15 MSc and BSc students
               Department of Photonics Engineering, Technical University of Denmark, Denmark
2006 – 2008   Graduated 2 BSc and 1 MSc.
               Osaka University, Dept. Electrical, Electronics and Information Engineering, Japan

TEACHING ACTIVITIES

2011 –   Lecturer – "Optical Communications Systems" course, 7.5 ECTS, DTU, Denmark
2015 –   Lecturer – "Research Immersion" I & II course, 5 ECTS, DTU, Denmark

ORGANISATION OF SCIENTIFIC MEETINGS

2016   Main organizer, Summer School, "Reconfigurable networks", 24-25 May 2016, Denmark
2016   Main organizer – Chair, Workshop "Big Data Photonics" collocated with OFC 2016, Collaboration with UCLA, USA

2015	Main organizer – Chair, Workshop "Role of photonic technologies for 5G and beyond" at Microwave Photonics Conference 2015, Cyprus
2015	Main organizer – Chair, Workshop "Green Optical Communications" collocated with CLEO-PR 2015, Korea
2015	Main organizer – Chair, Workshop "Big Data Photonics" collocated with OFC 2015, Collaboration with UCLA, USA
2014	Main organizer – Chair, Workshop "Summit workshop on Photonic Technologies" collocated with ESOF 2014, Denmark

Co-organizer of four more workshops in the 2011-2016 period.

COMMISSIONS OF TRUST

2015 – 2018	Ethics Advisory Committee, MCSA FiWin5G project
2015	Evaluator, Flemish Research Foundations, Belgium
2012,2015	Evaluator, Romanian National Research Council, Romania
2009	Evaluator, MIT-Singapore Alliance, Singapore
2006 –	Reviewer, IEEE and OSA journals (PTL, JLT, JSTQE, OE, OL) and Nature.

TPC and Chair in several international conferences in the 2011-2016 period (i.e. IEEE RWW2015, IEEE MWP 2015, IEEE RWW2016, OSA LAOP 2016).

MEMBERSHIP OF SCIENTIFIC SOCIETIES

2014 –	Senior Member of IEEE
2011	Member of the IEEE SIEPON standardization body (EPON interoperability)
2006 –	Fellow, Japan Society for Promotion of Science, Japan
2003 – 2006	ePhoton/ONE, Network of Excellence

PRIZES, AWARDS AND HONORS

2015	Villum Kann Rasmussen Young Investigator Award, 8 annually
2012	Supervised best master thesis PhotonicSweden - Optik & Fotonikdagarna (M. Iglesias)
2012	Best paper award FOAN 2012
2012	Supervised best thesis Danish Optical Society Junior Award (A. Rodes)
2012	Supervised best master thesis Erasmus Mundus (M. Iglesias)
2006	IEEE Photonics Society Best Graduate Fellowship Award, 2006 (12 winners from all over the world annually)

GRANTS FOR GRADUATE STUDIES

2015	CONICYT, Mexico, Coordinator, PhD Scholarship Saul Vazquez, 87k€
2015	Science without Borders, Coordinator, PhD Scholarship Victor Mehmeri, 93k€
2015	COLCIENCIAS, Colombia, Coordinator, PhD Scholarship Rafael Puerta, 83.7k€
2014	Science without Borders, Coordinator, PhD Scholarship Lucas Cavalcante, 93k€
2011 – 2013	Marie Curie International Incoming Fellowships, PI, 216.241€
2006	Japan Society for Promotion of Science Fellowship, PI, 95k€

RESEARCH GRANTS

2016	Marie Curie ITN 5G Fast FWD – partner. Under contract negotiation. 4 million€
2015	H2020 Marie Curie CELTA – coordinator. 4million€
2015	Villum Fonden – coordinator. 909k€
2015	H2020 Marie Curie FiWin5G – Research coordinator. 3867k€
2014	Danish Ministry of Research and Education mmW-SPRAWL – partner. 869k€
2013	EC FP7-ICT IPHOBAC-NG – partner. 4356k€
2013	FP7 Marie Curie ITN EID ABACUS – coordinator. 879k€

RESEARCH STAYS

2013	MAPNET Visiting Scholar, Osaka University
2007,2008	Visiting Researcher, National Institute of Communication Technologies, NICT, Japan
2006	Visiting PhD Researcher, Bristol University, United Kingdom

CAREER BREAKS

Dec2015	0.5M paternity leave for my second child
Sept-Nov2016	3M standard paternity leave (Danish system)

Publication list
Juan José Vegas Olmos

Journal papers

[1] J. J. Vegas Olmos, I. T. Monroy, P. Madsen, L. F. Suhr, B. Cimoli, T. K. Johansen, V. Zhurbenko, "Challenges in polybinary modulation for bandwidth limited optical links" Journal of Lasers, Optics and Photonics, vol. 3, Issue 1, 2016.

[2] J.J. Vegas Olmos, and I. Tafur Monroy, "Reconfigurable Radio-over-Fiber Networks," IEEE/OSA Journal of Optical Communications and Networking, vol. 7, Issue 11, pp. B23-B28, 2015.

[3] J.J. Vegas Olmos, X. Pang, A. Lebedev, M. Sales, and I. Tafur Monroy, "Wireless and wireline service convergence in next generation optical access networks - the FP7 WISCON project," IEICE Transactions in Communications, Vol. E97-B, No.08, August, 2014.

[4] J.J. Vegas Olmos, X. Pang, and I. Tafur Monroy, "E- and W-band high-capacity hybrid fiber-wireless link," IEICE Transactions in Communications, Vol.E97-B, No.07, July, 2014.

[5] J.J. Vegas Olmos, Lau Frejstrup Suhr, Bomin Li, and I. Tafur Monroy, , "Five level polybinary signaling for 10Gbit/s systems achieving 5.5 bit/s/Hz spectral efficiency," OSA Optics Express, vol. 21, issue 17, pp. 20417-20422, 2013.

[6] J.J. Vegas Olmos, G. Rodes, and I. Tafur Monroy, "Optical Switching for Dynamic Distribution of Wireless-over-Fiber Signals in Active Optical Networks," OSA Journal of Optical Communications and Networking, Journal of Optical Communications and Networking, Vol. 4 Issue 8, pp.622-627, 2012.

[7] J.J. Vegas Olmos, T. Kuri, and Ken-ichi Kitayama, "Reconfigurable Radio-over-Fiber networks: Multiple Access Functionality directly over the optical layer," IEEE Journal of Lightwave Communications and IEEE Transactions on Microwave Theory, Special call on microwave photonics, vol. 58, n11, 2010.

[8] J. J. Vegas Olmos, M. Tokushima, and Ken-ichi Kitayama, "Photonic Add/Drop Filter based on Integrated Photonic Crystal Structures," IEEE Journal of Selected Topics on Quantum Electronics, vol. 16, No. 1, pp. 332-337, 2010.

[9] J.J. Vegas Olmos, T. Kuri, and K. Kitayama, "Half-duplex 12-channel dense WDM 2.6-GHz-band radio-over-fiber system employing a 1.5 GHz bandwidth reflective semiconductor optical amplifier," OSA Journal of Optical Networking, vol. 7, Issue 12, pp. 989-994, Dec. 2008.

[10] J.J. Vegas Olmos, T. Kuri, and K. Kitayama, "Polarization-independent integrated demultiplexer for DWDM 60-GHz millimeter-wave-band radio-over-fiber systems," IEEE Photonic Technology Letters, vol. 20, Issue 24, pp. 2159-2161, Dec. 2008.

[11] J.J. Vegas Olmos, T. Kuri, T. Sono, K. Tamura, H. Toda and K. Kitayama, "Reconfigurable 2.5-Gbit/s Baseband and 60-GHz (155-Mbit/s) Millimeter-Wave-band Radio-Over-Fiber (Interleaving) Access Network," IEEE Journal of Lightwave Technology, vol. 26, issue 15, pp. 2506-2512, August 2008.

[12] J.J. Vegas Olmos, T. Kuri, T. Sono, K. Tamura, H. Toda and K. Kitayama, "Wireless and optical-integrated access network with peer-to-peer connection capability," IEEE Photonics Technology Letters, vol. 20, Issue 13, pp. 1127-1129, July 1, 2008.

[13] J.J. Vegas Olmos, T. Kuri, K.-I. Kitayama, "60-GHz-Band 155-Mbps and 1.5-Gbps Baseband Time-Slotted Full-Duplex Radio-over-Fiber Access Network," IEEE Photonics Technology Letters, vol. 20, no. 8, pp. 617-619, April 15, 2008.

[14] J.J. Vegas Olmos, T. Kuri, K.-I. Kitayama, "Dynamic reconfigurable WDM 60 GHz millimeter-wave-band radio-over-fiber access network: architectural considerations and experiment," IEEE Journal of Lightwave Technology, vol. 25, issue 11, pp. 3374-3380, Nov. 2007.

[15] J.J. Vegas Olmos, N. Chi, G. Zervas, D. Simeonidou, S. Yu, I. Tafur Monroy, and A.M.J. Koonen, "Optical node with time-space-and-wavelength domain contention resolution, deflection and dropping capability," OSA Optics Express, Vol. 14, Issue 24, pp. 11545-11550, November 2006.

[16] J.J. Vegas Olmos, I. Tafur Monroy, J.P.A. van Berkel, E.V.M. Verdurmen, J.G.L. Jennen, and A.M.J. Koonen, "On intra-node impairments and engineering rules for an optical label switching router supporting an FSK/IM labeling scheme," IEEE Journal of Lightwave Technology, vol. 24, issue 9, pp. 496-498, Sept. 2006.

[17] J.J. Vegas Olmos, I. Tafur Monroy, and A.M.J. Koonen, "Label and payload separator for a time-serial RZ IM/IM scheme at high bitrate" IEEE Photonic Technology Letters, Vol. 18, Issue 3, pp. 496-498, February 2006.

[18] J.J. Vegas Olmos, I. Tafur Monroy, M. Garcia Larrode, and A.M.J. Koonen, "All-optical processing of time-serial IM/DPSK encoded label and payload packets," IEEE Journal of Selected Topics in Quantum Electronics, vol. 12, pp.679-685, July-Aug. 2006.

[19] J. J. Vegas Olmos, N. Chi, I. Tafur Monroy, A.M.J. Koonen and S. Yu, "Time and wavelength domain contention resolution in an optical packet routing node," Microwave and Optical Technology Letters, vol. 48, n. 8, 1728-1729, September 2006.

[20] J. J. Vegas Olmos, I. Tafur Monroy, J. Turkiewicz, N. Calabretta, H.J.S. Dorren, and A.M.J. Koonen, "Asynchronous all-optical label extraction in a time-serial IM/DPSK scheme supporting variable packet length operation," Microwave and Optical Technology Letters, Vol. 46, No. 5, pp. 453-454, September 2005.

[21] J. J. Vegas Olmos, I. Tafur Monroy, Y. Liu, J. P. Turkiewicz, A. M. J. Koonen, "Self-controlled All-Optical label and payload separator for variable length bursts in a Time-Serial IM/DPSK Scheme," IEEE Photonics Technology Letters, IEEE, vol. 17, Issue 8, pp. 1692 – 1694, Aug. 2005.

[22] J.J. Vegas Olmos, J. Zhang, P.V. Holm-Nielsen, I. Tafur Monroy, V. Polo, A.M.J. Koonen, C. Peucheret, J. Prat, "Simultaneous optical label erasure and insertion in a single wavelength conversion stage of combined FSK/IM modulated signals," IEEE Photonic Technology Letters, vol. 16, Issue 9, pp. 2144-2146, Sept. 2004.

[23] J.J. Vegas Olmos, I. Tafur Monroy, F.M. Huijskens, A.M.J. Koonen, "In-band Time-to-Live signaling system for combined DPSK/SCM scheme in OLS," IEEE Photonics Technology Letters, vol. 16, no. 10, pp. 2386-2388. Oct. 2004.

[24] J. J. Vegas Olmos, I. Tafur Monroy, Y. Liu, M. Garcia Larrode, J. Turkiewicz, H. J. S. Dorren, and A. M. J. Koonen, "Asynchronous, self-controlled, all-optical label and payload separator using nonlinear polarization rotation in a semiconductor optical amplifier," OSA Optics Express 12, 4214-4219 (2004).

[25] J. J. Vegas Olmos, I. T. Monroy, A. M. J. Koonen, and Y. Yu, "High bit-rate combined FSK/IM modulated optical signal generation by using GCSR tunable laser sources," OSA Optics Express, vol. 11, no. 23, pp. 3136-3140 (2003).

[26] J.J.Vegas Olmos, I. Tafur Monroy, and A.M.J. Koonen, "Técnicas de etiquetado de señales ópticas en redes de conmutacion de ráfagas," IEEE Buran Student Branch, N. 20, pp.28-31, December 2003.

[27] S. Rommel, S. Rodriguez, L. Chorchos, E. Grakhova, A. Sultanov, J. Turkiewicz, J.J. Vegas Olmos, I. Tafur Monroy, "Outdoor W-band hybrid photonic wireless link based on an optical SFP+ module," IEEE Photonic Technology Letter, Issue 99, 2016.

[28] L.C.P. Cavalcante, L. F. Q. Silveira, S. Rommel, J.J. Vegas Olmos, I. Tafur Monroy, "Performance Analysis of Wavelet Channel Coding in COST207-based Channel Models on Simulated Radio-over-Fiber Systems at the W-Band", Optical and Quantum Electronics (ISSN: 0306-8919), vol: 48, issue: 28, 2016.

[29] L. F. Suhr, P. Madsen, I. Tafur Monroy, J.J. Vegas Olmos, "Analog-based duobinary-4-PAM for electrical bandwidth limited optical fiber links," Optica Applicata, Vol. 46, No. 1, pp. 71-78, 2016.

[30] A. Jurado-Navas, T. R. Raddo, J.M. Garrido-Balsells, B-H. V. Borges, J.J. Vegas Olmos, and I. Tafur Monroy, "Hybrid optical CDMA-FSO communications network under spatially correlated gamma-gamma scintillation," OSA Optics Express, Vol. 24, Issue 15, 16799-16814, 2016.

[31] A. Jurado-Navas, A. Tatarczak, X. Lu, J. J. Vegas Olmos, J. M. Garrido-Balsells, and I. Tafur Monroy, "850-nm hybrid fiber/free-space optical communications using orbital angular momentum modes," Optics Express Vol. 23, Issue 26, pp. 33721-33732, 2015.

[32] A. Jurado-Navas, J.M. Garrido-Balsells, M. Castillo-Vazquez, A. Puerta-Notario, I. Tafur Monroy, and J.J. Vegas Olmos, "Optimal threshold detection for M - turbulent optical links," Optica Applicata, Accepted. 2016,

[33] B. Cimoli, J. M. Estaran Tolosa, G. A. Rodes Lopez, J.J. Vegas Olmos, I. Tafur Monroy, "100G Short-wave WDM Solutions for Multimode Fiber Data Links", Optica Applicata, 2016. Accepted.

[34] S. Rommel, L. C. P. Cavalcante, A. G. Quintero, A. K. Mishra, J. J. Vegas Olmos, I. Tafur Monroy, "W-Band Photonic-Wireless Link with a Schottky Diode Envelope Detector and Bend Insensitive Fiber," OSA Optics Express, Vol. 24, Issue 11, pp. 11312-11322, 2016.

[35] E. P. Grakhova, S. Rommel, A. Jurado-Navas, A. Kh. Sultanov, J. J. Vegas Olmos, "First Experimental Impulse-Radio Ultra-Wideband Transmission Under the Russian Spectral Emission Mask," IET Electronics Letters, 2016, DOI: 10.1049/el.2016.0635.

[36] S. Rodriguez, R. Puerta Ramírez, H. Kim, J.J. Vegas Olmos, I. Tafur Monroy, "Photonic up-converation of Carrierless Amplitude Phase signals for wireless communications on the Ka-band," Microwave and Optical Technology Letters, Vol. 58, Issue 9, pp. 2068-2070, 2016.

[37] L. Cavalcante, S. Rommel, S. Rodriguez, J. J. Vegas Olmos, I. T. Monroy, "On the capacity of radio-over-fiber links at the W-band," Optical and Quantum Electronics, 48:279, 2016. DOI 10.1007/s11082-016-0554-6.

[38] R. Puerta, S. Rommel, J.A. Altabas, L. Pyndt, R. Idrissa, A. Kh. Sultanov, J.J. Vegas Olmos, and I. Tafur Monroy, "Multiband carrierless amplitude/phase modulation for ultra-wideband high data rate wireless communications," Microwave and Optical Technology Letters, vol. 58, No. 7, July 2016.

[39] Alexander Lebedev, Xiaodan Pang, J.J. Vegas Olmos, I. Tafur Monroy, Søren Forchhammer, "Low complexity source and channel coding for mm-wave hybrid fiber-wireless links," Optics Communications, Volume 318, May , Pages 142–146, 2014.

[40] Alexander Lebedev, Xiaodan Pang, J. J. Vegas Olmos, Marta Beltran, Roberto Llorente, Søren Forchhammer, and Idelfonso Tafur Monroy "Feasibility study and experimental verification of simplified fiber-supported 60 GHz picocell mobile backhaul links," IEEE Photonics Journal, vol. 5, issue 4, August 2013.

[41] X. Pang, M. Beltran, J. Sanchez, Eloy Pellicer, J.J. Vegas Olmos, R. Llorente, and I. Tafur Monroy, "DWDM Fiber-Wireless Access System with Centralized Optical Frequency Comb-based RF Carrier Generation," Submitted to OSA Optics Express.

[42] Alexander Lebedev, J. J. Vegas Olmos, Miguel Iglesias, Søren Forchhammer, and Idelfonso Tafur Monroy, "A novel method for combating dispersion induced power fading in dispersion compensating fiber," Opt. Express 21, 13617-13625 (2013).

[43] A. Lebedev, X. Pang, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, S. Forchhammer, "Demonstration and Comparison Study for V- and W-band Real-Time HD Video Delivery in Diverse Fiber-Wireless Infrastructure," Fiber and Integrated Optics, volume 32, issue 2, pp. 93-104, 2012.

[44] T. Kuri, H. Toda, <u>J.J. Vegas Olmos</u>, and K. Kitayama, "Reconfigurable Dense Wavelength Division Multiplexing Millimeter-Wave-Band Radio-over-Fiber Access System Technologies," IEEE Journal of Lightwave technology, Invited paper, vol. 28, no. 16, pp. 2247-2257, August, 2010.

[45] M. Tokushima, <u>J.J. Vegas Olmos</u>, and Ken-ichi Kitayama, "Ultracompact Photonic-Waveguide Circuits in Si-Pillar Photonic-Crystal Structures for Integrated Nanophotonic Switches," Journal of Nanoscience and Nanotechnology, vol. 10, No.3, pp. 1626-1634, March 2010.

[46] M. Tokushima, <u>J. J. Vegas Olmos</u>, and Ken-ichi Kitayama, "Multimode Si-wire waveguides for integrated optical delay lines," Electronics Letters, Vol. 45, Issue 10, pp. 500-501, May 2009.

[47] A.M.J. Koonen, N. Yan, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, C. Peucheret, E. van Breusegem, E. Zouganeli, "Label-controlled optical packet routing - technologies and applications," IEEE Journal of Selected Topics in Quantum Electronics, Invited Paper, pp. 1540-1550, vol. 13, issue 5, part 2, Sept-Oct. 2007.

[48] N. Chi, H. Liu, M. Li, <u>J.J. Vegas Olmos</u>, R. Geldenhuys, D. Huang, and S. Yu, "Improving the performance of a crosspoint-switch-based optical buffer by using a differential phase-shift keying payload," Optical Engineering, vol. 46, no. 7, July 2007.

[49] R. Geldenhuys, Y. Liu, <u>J. J. Vegas Olmos</u>, F. W. Leuschner, G. D. Khoe, and H. J. S. Dorren, "An optical threshold function based on polarization rotation in a single semiconductor optical amplifier," OSA Optics Express 15, pp. 7275-7280, 2007.

[50] M. Garcia Larrode, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, and E.J.M. Verdurmen, "Microwave signals generation and transmission based on OFM with polarization interferometer," IEEE Journal of Lightwave Technology, vol. 25, no. 6, pp. 1372 - 1378, June 2007.

[51] M. Garcia Larrode, A.M.J. Koonen, and <u>J.J. Vegas Olmos</u>, "Overcoming modal bandwidth limitation in radio-over-multimode fiber links," IEEE Photonic Technology Letters, Vol. 18, Issue 22, pp. 2428-2430, Nov.15, 2006.

[52] V. Polo, J. Prat, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, and A.M.J. Koonen "All-optical FSK-WDM to IM-OTDM transmultiplexing for access PON networks," OSA Journal of Optical Networking, vol. 5, issue 10, pp. 739-746, 2006.

[53] Nan Chi, <u>J.J. Vegas Olmos</u>, Zhuoran Wang, Oliver Ansell, Kornkamol Thakulsukanant and Siyuan Yu, "Experimental Characteristics of Optical Crosspoint Switch Matrix and Its Applications in Optical Packet Switching," IEEE Journal of Lightwave Technology, vol. 24, issue 10, pp. 3646-3653, Oct. 2006.

[54] M. García Larrodé, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, and E.J.M. Verdurmen, "Dispersion tolerant radio-over-fibre transmission of 16- and 64QAM radio signals at 40GHz ," IEE Electronic Letters, vol. 42, issue 15, pp. 53—54, July 2006.

[55] Idelfonso Tafur Monroy, Erik van Breusegem, Ton Koonen, <u>J.J. Vegas Olmos</u>, Johan van Berkel, Jean Jennen, Christophe Peucheret, Evi Zouganeli, "Optical labeled switched networks: laboratory trial and network emulator in the IST-STOLAS project," IEEE Communication Magazine, vol. 44, issue 8, pp. 43—51, August 2006.

[56] I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, M. Garcia Larrode, A.M.J. Koonen,   C. Díaz Jiménez, "In-band 16-QAM and multi-carrier SCM modulation to label DPSK payload signals for IP packet routing", OSA Optics Express, Vol. 14, pp. 1000-1005, February 2006.

[57] M. Garcia Larrode, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, and A. Ng'oma, "Bidirectional Radio-over-Fiber Link Employing Optical Frequency Multiplication", IEEE Photonic Technology Letters, Vol. 18, Issue 1, pp. 241-243, January 2006.

[58] M. Garcia Larrode, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, "Fiber-based broadband wireless access employing Optical Frequency Multiplication", IEEE Journal of Selected Topics in Quantum Electronics, vol. 12, pp.875-881, July-Aug. 2006.

[59] Ng'oma, I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, A.M.J.Koonen, G-D. Khoe, "Frequency up-conversion in multimode fibre-fed broadband indoor wireless networks", Microwave and Optical Technology Letters, vol. 41, pp. 28-30, April, 2004.

[60] I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, A.M.J. Koonen, F.M. Huijskens, H. de Waardt, G-D. Khoe, "Optical label switching by using DPSK and in-band sub-carrier multiplexing modulation format", Optical Engineering Letters, vol. 43, pp.1476-1477, July 2004.

[61] J. Prat, V. Polo, C. Bock, C. Arellano, <u>J.J. Vegas Olmos</u>, "Full-duplex Single Fiber Transmission using FSK Downstream and IM Remote Upstream Modulations for Fiber-to-the-Home," IEEE Photonics Technology Letters, Volume: 17 , Issue: 3, Pages:702 - 704 , March 2005.

Popular Dissemination

[62] "Record-breaking reach for low-cost data transmission between data centers," Business Wire, March 01 2016, Public release.
http://www.businesswire.com/news/home/20160301006467/en/Record-breaking-Reach-Low-cost-Data-Transmission-Data-Centers

[63] <u>J.J. Vegas Olmos</u>, J.M. Delgado Mendinueta, "Report on the Green Optical Communications Workshop at KAIST," IEICE Communications Society Global Newsletter, vol. 39, no. 4, pp. 8-9, 2015.

[64] <u>J.J. Vegas Olmos</u>, "Life after Japan: the Danish case," IEICE Communications Society Global Newsletter, vol. 38, no. 3, pp. 8-9, 2014.

International conferences

[65] J.J. Vegas Olmos, Millimeter-wave and Terahertz Reconfigurable Radio-over-Fiber Systems, PIERS 2016. Invited Talk.

[66] <u>J.J. Vegas Olmos</u>, R. Puerta, and I. Tafur Monroy, "Secure Multi-Gigabit Ultra-Wide Band Communications for Personal Area Networks," Invited Paper, 21st European Conference on Networks and Optical Communications, NOC 2016, paper S9.1, Lisbon, Portugal, 2016.

[67] <u>J.J. Vegas Olmos</u>, "Silicon Photonics for Micro- and Millimeter Wave Signal Generation," EMN Meeting on Photonics, Invited Talk, 2016.

[68] <u>J.J. Vegas Olmos</u>, "New developments in polybinary modulation for bandwidth limited channels," Invited Talk, Material Congress 2016, Alicante, Spain, 2016.

[69] <u>J.J. Vegas Olmos</u>, "New advances in antennas for micro- and millimeter wave communications based on emerging materials and reconfigurable structures," Invited Talk, Material Congress 2016, Alicante, Spain, 2016.

[70] <u>J.J. Vegas Olmos</u>, "Advanced solutions for inter- and intra-data center connectivity", *Invited Talk*, Advanced Communications Technology Symposium, Osaka University, 28 April, 2016.

[71] <u>J.J. Vegas Olmos</u>, A. Astorino, S. Rommel, S. Rodriguez, I.T. Monroy, "Optical Components for Reconfigurable Photonic Networks and Mobile Systems," BIT's 2nd Annual World Congress of Smart Materials, 2016, March 4-6, Singapore.

[72] <u>J.J. Vegas Olmos</u>, "Polybinary modulation for bandwidth limited optical links" Optics 2015, *Invited Paper*, Valencia, Spain, 2015.

[73] <u>J.J. Vegas Olmos</u>, V. Mehmeri, and I. Tafur Monroy, "Flexible Edge Nodes enabled by Hybrid Software Defined Optics & Networking," *Invited Paper*, OSA Asia Communications and Photonics Conference 2015, paper ASu5G.1, Hong-Kong, 2015.

[74] J.J. Vegas Olmos, M. Heck, and I. Tafur Monroy, "Photonic Integrated Circuits for mmW systems," *Invited Paper*, PIERS, Prag, 2015.

[75] J.J. Vegas Olmos and I. Tafur Monroy, "Millimeter-wave wireless links for 5G mobile networks," *Invited Paper*, 18th International Conference on Transparent Optical Networks, ICTON, paper Mo.B5.3, Budapest, 2015.

[76] J.J. Vegas Olmos, and I. Tafur Monroy, "Reconfigurable Radio-Over-Fiber Networks," *Invited Paper*, Optical Fiber Communications, March, Los Angeles, 2015.

[77] J.J. Vegas Olmos, F.J. Vaquero Caballero, and I. Tafur Monroy, "Analog Filter Design Rules for Multilevel Polybinary Signaling Generation," Asia Communications and Photonics Conference 2014, paper ATh1F.2, 2014.

[78] J.J. Vegas Olmos and I. Tafur Monroy, "High capacity wireless data links in the W-band using hybrid photonics-electronic techniques for signal generation and detection," *Invited Paper*, Radio Wireless Week, RWW, Newportbeach, California, USA, January, 2014.

[79] J.J. Vegas Olmos and I. Tafur Monroy, "Fiber-wireless Links Supporting High-capacity W-band Channels," *Invited Paper*, PIERS Stockholm, paper 3P4a2, 2013.

[80] J.J. Vegas Olmos, L.F. Suhr, B. Li, and I. Tafur Monroy, "10 Gbps Five Levels Polibinary Signaling for Short Range and Access Networks," Asia Communications and Photonics Conference 2013, paper AW4G.3, November 2013.

[81] J.J. Vegas Olmos, X. Pang, A. Lebedev, and I. Tafur Monroy, "Multi-Gigabit Capacity W-band Hybrid Wireless-Photonic Transmission Link," Asia Communications and Photonics Conference, paper ATh3G.1, 2013.

[82] J.J. Vegas Olmos, X. Pang, A. Lebedev, and I. Tafur Monroy, "VCSEL sources for optical fiber-wireless composite data links at 60GHz," OptoElectronics and Communications Conference, Kyoto, paper TuPP.10, Japan, 2013.

[83] J.J. Vegas Olmos, A. Caballero, D. Zibar, J. Jensen, and I. Tafur Monroy, "Photonic Technologies for Short Range Hybrid Optical Fibre-Wireless Data Links," *Invited Paper*, OSA Latin America Optics & Photonics Conference, LAOP 2012, São Sebastião, Brazil, November, 2012.

[84] J.J. Vegas Olmos, R. Rodes, and I. Tafur Monroy, "Low power consumption O-band VCSEL sources for upstream channels in PON systems," OptoElectronics and Communications Conference, OECC 2012, paper SC1_1061, Busan, Korea, 2012.

[85] J.J. Vegas Olmos, J. Sugawa, H. Ikeda, "Hyper-branched PON development for high-bandwidth demanding access networks," World Telecommunications Congress, paper TS-B4.1, Miyazaki, Japan, 2012.

[86] J.J. Vegas Olmos, J. Sugawa, H. Ikeda, K. Sakamoto, "GPON and 10G-EPON coexisting systems and filtering issues at the OLT," OECC 2011, paper 8E1-2, Kaohsiung, Taiwan, 2011.

[87] J.J. Vegas Olmos, D. Mashimo, H. Ikeda, K. Sakamoto, "Expanded power budget of a 10G-EPON prototype for highly scalable access networks", OECC 2010, paper 8A4-5, Sapporo, Japan, 2010.

[88] J.J. Vegas Olmos, T. Kuri, K.-I. Kitayama, "Dynamically Reconfigurable WDM Millimeter-wave Radio-over-Fiber and Digital Optical Access Networks," *Invited Paper*, IEEE/LEOS Topical Meetings, MB2.2, Newport, Los Angeles, July 2009.

[89] J. J. Vegas Olmos, Masatoshi Tokushima, and Ken-ichi Kitayama, "Packet Switching Demonstrator Using an Integrated and Pigtailed Add-Drop Filter based on Photonic Crystal Structures," CLEO/QELS 2006, Paper CTuL1, Maryland, USA, 2009.

[90] J.J. Vegas Olmos, T. Kuri, T. Sono, K. Tamura, H. Toda and K. Kitayama, "Fully-interleaved WDM Reconfigurable Baseband (2.5-Gbit/s) and 60-GHz (155-Mbit/s) Millimeter-Wave-Band

Radio-over-Fiber Access Network," ECOC 2008, paper Tu.3.E.3., Brussels, Belgium, September 2008.

[91] J.J. Vegas Olmos, T. Kuri, K.-I. Kitayama, "Time-slotted full-duplex access network for baseband and 60-GHz millimeter-wave-band radio-over-fiber," OFC/NFOEC 2008, paper OThP5, San Diego, USA, February 2008.

[92] J.J. Vegas Olmos, T. Kuri, K.-I. Kitayama, "Dynamic channel allocation experiment in DWDM millimeter-wave radio-on-fiber access network," ECOC 2007, Tue 3.3.5., Berlin, Germany, Sept. 2007.

[93] J.J. Vegas Olmos, T. Kuri, K.-I. Kitayama, "Dynamic channel allocation experiment in DWDM millimeter-wave radio-on-fiber access network," IEICE MW 2007, pp. 131-136, Hokkaido, Japan.

[94] J.J. Vegas Olmos, N. Chi, G. Zervas, D. Simeonidou, S. Yu, I. Tafur Monroy, and A.M.J. Koonen, "Optical node with time-space-and-wavelength domain contention resolution, deflection and dropping capability," ECOC 2006, Th.1.2.3, Cannes, 2006.

[95] J.J. Vegas Olmos, J.P. Turkiewicz, M. Garcia Larrode, I. Tafur Monroy, A.M.J. Koonen, V. Polo, A. Ausiro, and J. Prat, "FSK-WDM to IM-OTDM conversion for fiber-to-the-premises access networks," OFC 2006, Anaheim, Los Angeles, OFE6, 2006.

[96] J. J. Vegas Olmos, I. Tafur Monroy, J.P. Turkiewicz, Y. Liu, and A.M.J. Koonen, "All-optical label and payload separator in a time-serial RZ-IM/IM scheme," CLEO/QELS 2006, Paper CThHH, Long Beach, USA, 2006.

[97] J.J. Vegas Olmos, I. Tafur Monroy, J.P. Turkiewicz, M. Garcia Larrode, R. Geldenhuys, A.M.J. Koonen, "An all-optical time-serial label and payload separator generating a synchronization pulse," In proceedings of ECOC 2005, Mo.4.4.2., Glasgow, 2005.

[98] J.J. Vegas Olmos, I. Tafur Monroy, A.M.J. Koonen, "Experimental assessment of intra-node crosstalk in a labelled system based on MZI wavelength converters," In proceedings of the NOC 2005, pp. 407-414, July 5-7, London, England.

[99] J. J. Vegas Olmos, I. Tafur Monroy, Y. Liu, A. M. J. Koonen, "Self-controlled All-Optical label and payload separator for variable length bursts in a Time-Serial IM/DPSK Scheme," OFC 2005, Anaheim, Los Angeles, OTuC6, 2005.

[100] J.J. Vegas Olmos, I. Tafur Monroy, J. Jennen, A. Saenz Heras, B. Bastiaans, A.M.J. Koonen, "Wide Dynamic 10Gbit/s automatic gain control for combined FSK/IM modulated optical signal". Proceedings of NOC2004, pp. 144-148, Eindhoven, The Netherlands, 2004.

[101] J.J. Vegas Olmos, I. Tafur Monroy, A.M.J. Koonen, "Packed marking for fast discarding in an OLS scheme", In proceedings of ECOC 2004, paper We4.P.091, vol. 3, pp. 650-651, 2004.

[102] J.J. Vegas Olmos, I. Tafur Monroy, E. Tangdiongga, J.P.A. van Berkel, A.M.J. Koonen, J.Prat, "Influence of optical filters on the performance of FSK/IM transmission schemes". In Proceedings of Opnetec 2004, Pisa, Italy, October 18-20, pp. 364-370, 2004.

[103] J.J. Vegas Olmos, E.J.M. Verdurmen, I. Tafur Monroy, J.P. Turkiewicz, N. Yan, H. de Waardt, and A.M.J. Koonen , "Wavelength conversion with multicasting capabilities deploying Highly Nonlinear Fiber for time-serial labeled networks," In Proceedings of IEEE/LEOS Benelux Annual Symposium 2005, Mons, Belgium, December 1-2, pp. 181-184, 2005.

[104] J.J. Vegas Olmos, I.Tafur Monroy, A.M.J. Koonen, and J. Prat, "Experimental assessment of polarization mode dispersion effect over a FSK/IM signal," In Proceedings of IEEE/LEOS Benelux Annual Symposium 2004, Genth, Belgium, December 2-3, pp. 187-190, 2004.

[105] J.J. Vegas Olmos, I. Tafur Monroy, A.M.J. Koonen, G.D. Khoe, "Combined FSK/IM modulation generated by using GSCR tunable laser sources", proc. IEEE/LEOS Benelux Annual Symposium 2003, 20-21 November 2003, Enschede, The Netherlands, 2003.

[106] A. Jurado-Navas, T. Raddo, A. Sanches, J. Garrido Balsells, B. Borges, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy, "Asynchronous Free-Space Optical CDMA Communications System for Last-mile Access Network," OSA Propagation Through and Characterization of Atmospheric and Oceanic Phenomena, pcAOP, paper TU2A.5, Washington DC, June, 2016.

[107] A. Ruiz Salazar, S. Rommel, E. Anufriyev, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Convergence of photonics and electronics for terahertz wireless communications," Invited Paper, 21st European Conference on Networks and Optical Communications, NOC 2016, paper S7.1, Lisbon, Portugal, 2016.

[108] C. Wagner, M. Eiselt, S. Zou, B. Teipen, K. Grobe, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Wavelength-agnostic WDM-PON System," Invited Paper, International Conference on Transparent Optical Networks, paper Tu.D2.3W, ICTON 2016.

[109] E.P. Grakhova, S. Rommel, A. Jurado-Navas, A. Kh. Sultanovy, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy, "Pulse Shaping for High Capacity Impulse Radio Ultra-Wideband Wireless Links Under the Russian Spectral Emission Mask," Submitted. IEEE 27th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, Valencia, Spain, 2016.

[110] B. Cimoli, G. Silva Valdecasa, A. Blanco Granja, J. Jensen, I. Tafur Monroy, T. Johansen, <u>J. J. Vegas Olmos</u>, "An Ultra-Wideband Schottky Diode Based Envelope Detector for 2.5 Gbps signals," European Microwave Week, Accepted, 2016.

[111] U. Armendariz, S. Rommel, S. Rodriguez, I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, C. B. Olsen, "Evaluation and Performance Analysis of 3D Printing Technique for Ka-Band Antenna Production" European Microwave Week, Accepted, 2016.

[112] N. Eiselt, A. Dochhan, H. Griesser, M. Eiselt, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Experimental comparison of 56 Gbit/s PAM-4 and DMT for data center interconnects applications," Proceedings of ITG-Fachtagung Photonische Netze 2016, 2016,

[113] B. Andrus-Mihai, A. Autenrieth, S. Pachnicke, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy," Live Migration Downtime Analysis of a VNF Guest for a Proposed Optical FMC Network Architecture," Proceedings of ITG-Fachtagung Photonische Netze 2016, 2016.

[114] C. Wagner, M. Eiselt, K. Grobe, J.L. Wei, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Evaluation of crosstalk attacks in access networks," Proceedings of ITG-Fachtagung Photonische Netze 2016, 2016.

[115] R. Puerta, S. Rommel, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy "10Gb/s Ultra-Wideband Wireless Transmission Based on Multi-Band Carrierless Amplitude Phase Modulation," IEEE Wireless and Microwave Technology Conference, WAMICON, paper 162, 2016.

[116] C. Wagner, S. Spolitis, <u>J. J. Vegas Olmos</u>, V. Bobrovs, I. Tafur Monroy, "Re-use of Low Bandwidth Equipment for High Bit Rate Transmission Using Signal Slicing Technique," OSA Asia Communications and Photonics Conference 2015, paper ASu5E.3, Hong-Kong, 2015.

[117] X. Lu, A. Tatarczak, S. Rommel, S. Rodriguez, <u>J. J. Vegas Olmos</u>, I. Tafur Monroy," Microwave Photonics Technologies Supporting High Capacity and Flexible Wireless Communications Systems," *Invited Paper*, OSA Asia Communications and Photonics Conference 2015, paper ASu1J.5, Hong-Kong, 2015.

[118] L. Suhr, I. Tafur Monroy, and <u>J.J. Vegas Olmos</u>, "Ultra-wideband radar for breath tracking with optical fiber for remote reach extension," Proceedings of Optical Fiber Communication, paper Th2A.27, Los Angeles, 2016.

[119] S. Rommel, S. Rodriguez, Ł. Chorchos, E. P. Grakhova, A. Sultanov, J. P. Turkiewicz, <u>J. J. Vegas Olmos</u>, I. Tafur Monroy, "225m OutdoorW-Band Radio-over-Fiber Link Using an Optical SFP+ Module," OFC 2016.

[120] N. Eiselt, J. Wei, H. Griesser, A. Dochhan, M. Eiselt, J.-P. Elbers, <u>J. J. Vegas Olmos</u> and I. Tafur Monroy2, "First Real-Time 400G PAM-4 Demonstration for Inter-Data Center Transmission over 100 km of SSMF at 1550 nm," OFC 2016.

[121] N. Eiselt, H. Griesser, J. Wei, A. Dochhan, M. Eiselt, J.-P. Elbers, <u>J. J. Vegas Olmos</u>, and I. Tafur Monroy2, "Real-Time Evaluation of 26-GBaud PAM-4 Intensity Modulation and Direct Detection Systems for Data-Center Interconnects," OFC 2016.

[122] B, Andrus, <u>J.J. Vegas Olmos</u>, V. Mehmeri, I. Tafur Monroy, S. Spolitis, V. Bobrovs, "SDN Data Center Performance Evaluation of Torus and Hypercube Interconnecting Schemes," Proceedings of IEEE Advances in Wireless and Optical Communications (ISBN: 9781467374316), 2015, IEEE Press, Riga, Latvia, 2015.

[123] S. Spolitis, V. Bobrovs, C. Wagner, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Towards Bandwidth Scalable Transceiver Technology for Optical Metro-Access Networks," Proceedings of IEEE Advances in Wireless and Optical Communications (ISBN: 9781467374316), pages: 94-97, 2015, IEEE Press, Riga, Latvia, 2015.

[124] S. Rommel, L. Cavalcante, <u>J. J. Vegas Olmos</u>, and I. Tafur Monroy, "Demonstration of 4Gbit/s Duobinary Ka-Band Hybrid Photonic-Wireless Transmission," OSA Asia Communications and Photonics Conference 2015, paper AM1B.7, Hong-Kong, 2015.

[125] S. Rommel, L. Yi, M. Shi, I. Tafur Monroy, and <u>J. J. Vegas Olmos</u>, "Demonstration of 4Gbit/s Duobinary Ka-Band Hybrid Photonic-Wireless Transmission," OSA Asia Communications and Photonics Conference 2015, paper ASu1J.2, Hong-Kong, 2015.

[126] L. F. Suhr, I. Lyubomirsky, H. Daghighian, C. Kocot, I. Tafur Monroy, <u>J. J. Vegas Olmos</u>, "Comparing 52 Gbps Duobinary and 4-PAM Transmission Over 100m OM-3 Fiber With 25 GHz Class VCSELs, " OSA Asia Communications and Photonics Conference 2015, paper ASu4C. 2, Hong-Kong, 2015.

[127] P. Madsen, L. Suhr, S. Rodriguez, <u>J. J. Vegas Olmos</u>, I. Tafur Monroy, "Long Reach RFID-over-Fiber Distribution and," OSA Asia Communications and Photonics Conference 2015, paper AM1E.3, Hong-Kong, 2015.

[128] V. Mehmeri, <u>J. J. Vegas Olmos</u>, I. Tafur Monroy, "Capacity Extension of Software Defined Data Center Networks With Jellyfish Topology" OSA Asia Communications and Photonics Conference 2015, paper AM1H. 5, Hong-Kong, 2015.

[129] B. Cimoli, J. Estaran, G. Rodes, A. Tatarczak, <u>J. J. Vegas Olmos</u>, I. Tafur Monroy, "100G WDM Transmission over 100 meter Multimode Fiber," OSA Asia Communications and Photonics Conference 2015, paper ASu2A.89. 5, Hong-Kong, 2015.

[130] M. P. Thakur, S. Mikroulis, C. C. Renaud, <u>J.J. Vegas Olmos</u>, M.C.R. Medeiros, J.E. Mitchell, "Cost-Efficient DWDM-PON / Mm-Wave Wireless Integration using Coherent Radio-over-Fiber (CRoF)," 2015 IEEE International Topical Meeting on Microwave Photonics, 26-29 October 2015, paper P-19, Paphos, Cyprus, 2015.

[131] P. Madsen, L. Suhr, S. Rodriguez, <u>J.J. Vegas Olmos</u> and I. Tafur Monroy, "RFID-over-Fiber system for agricultural exploitations - Wireless track and trace with range extension using optical fiber," 2015 IEEE International Topical Meeting on Microwave Photonics, 26-29 October 2015, paper P-28, Paphos, Cyprus, 2015.

[132] S. Rommel, L. C. P. Cavalcante, <u>J. J. Vegas Olmos</u>, I. Tafur Monroy, A. K. Mishra, "Requirements for Bend Insensitive Fiber in Millimeter-Wave Fronthaul Systems," 2015 IEEE International Topical Meeting on Microwave Photonics, 26-29 October 2015, Paper P-30, Paphos, Cyprus, 2015.

[133] A. Tatarczak, X. Lu, S. Rommel, S. Rodriguez, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy, "Radio-over-Fiber Transmission Using Vortex Modes," 2015 IEEE International Topical Meeting on Microwave Photonics, 26-29 October 2015, paper P-32, Paphos, Cyprus, 2015.

[134]   B. Andrus, O. Poncea, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Performance Evaluation of Two Highly Interconnected Data Center Networks" 18th International Conference on Transparent Optical Networks, ICTON, paper We.C3.4, Budapest, Hungary, 2015.

[135]   V. Mehmeri, B. Andrus, I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, "Software defined optics and networking for large scale data centers," Poster, DTU Fotonik Seminar, 2015.

[136]   R. Puerta Ramirez, A. Tatarczak, B. Cimoli, J.M. Estaran Tolosa, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Advanced functionalities in optical data links," Poster, DTU Fotonik Seminar, 2015.

[137]   S. Rommel, L. Cavalcante, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy, A. Galvis Quintero, "'Channel Characterization for High-Speed W-Band Wireless Communication Links," OECC 2015, Shanghai, China, June 28th-July 2nd, 2015.

[138]   S. Rommel, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Silicon Photonics Integrated Circuits for 5th Generation mm-Wave Wireless Communications," Poster, Big Data Photonics, Los Angeles, 2015.

[139]   N. Eiselt, H. Griesser, A. Dochhan, M. Eiselt, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Digital Signal Processing for 100G/400G Optical Fiber Connectivity Links," Poster, Big Data Photonics, Los Angeles, 2015.

[140]   C. Wagner, M. Eiselt, K. Grobe, I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, "Robust and Flexible Wavelength Division Multiplexed Optical Access Networks," Poster, Big Data Photonics, Los Angeles, 2015.

[141]   B. Andrus, I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, "Software Defined Optics and Networking for Large Scale Data Centers," Poster, Big Data Photonics 2015, Los Angeles, 2015.

[142]   S. Saldana Cercos, C. Wagner, <u>J.J. Vegas Olmos</u>, A. Manolova Fagertun, and Idelfonso Tafur Monroy, "Digital Signal Processing for a Sliceable Transceiver for Optical Access Networks," ISCC2015, Larnaca, Cyprus, 2015.

[143]   C. Wagner, M. Eiselt, K. Grobe, I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, "Coherent and incoherent Crosstalk evaluation in wavelength-agnostic WDM-PON systems" in Photonic Networks, ITG-Fachtagung, pp. 62-66, VDE Verlag, Leipzig, 2015.

[144]   N. Eiselt, H. Griesser, M. Eiselt, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Experimental investigation and comparison of different equalizers for four level pulse amplitude modulation," Photonics Networks, ITG-Factagung, pp. 140-144, VDE Verlag, Leipzig, 2015.

[145]   I. Tafur Monroy, M. Usuga, and <u>J.J. Vegas Olmos</u>, "High Capacity Optical Links for Datacentre Connectivity," *Invited Paper*, paper We.B3.1, 18th International Conference on Transparent Optical Networks, ICTON, 2015.

[146]   L. F. Suhr, <u>J.J. Vegas Olmos</u>, B. Mao, X. Xu, G.N. Liu and I. Tafur Monroy, "Direct modulation of 56 Gbps duobinary-4-PAM," Optical Fiber Communications conference, Paper Th1E.7, OFC 2015.

[147]   A. Tatarczak, J. Estaran, M. Iglesias Olmedo, J. B. Jensen, <u>J.J. Vegas Olmos</u>, Idelfonso Tafur Monroy, "Advanced digital signal processing for high-speed access networks," *Invited Paper*, SPIE Conference, Photonics West, February 2015.

[148]   C. Wagner, P. Madsen, S. Spolitis, <u>J.J. Vegas Olmos</u>, and I.T. Monroy, "Sliceable transponders for metro-access transmission links," *Invited Paper*, SPIE Conference, Photonics West, February 2015.

[149]   A. Stöhr, S. Babiel, R. Chuenchom, M. Steeg, J. Mitchell, C. Renaud, M. Thakur, F. van Dijk, A. Steffan, M. O'Keefe, Y. Leiba, P. Polis, P. Parol, <u>J.J. Vegas Olmos</u>, I. Tafur, "Integrated Coherent Radio-over-Fiber Units for Millimeter-Wave Wireless Access," Photonics West, SPIE Conference, *Invited Paper*, 2015.

[150] L. Cavalcante, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy, "High Capacity RoF Links at 75-300 GHz," Asia Communications and Photonics Conference 2014, ATh3A.157, Shanghai, 2014.

[151] S. Spolitis, C. Wagner, <u>J.J. Vegas Olmos</u>, V. Bobrovs, G. Ivanovs and I. Tafur Monroy, "Experimental Demonstration of a Scalable Sliceable Transceiver for Optical Access Networks," Asia Communications and Photonics Conference 2014, ATh1H.3, Shanghai, 2014.

[152] Miguel Iglesias Olmedo, <u>J.J. Vegas Olmos</u>, U. Westergren, S. Popov, and I. Tafur Monroy, "Chirp investigation in EML's towards frequency shift keying modulation," Asia Communications and Photonics Conference 2014, ATh3A.12, Shanghai, 2014.

[153] Lau F. Suhr, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "10-Gbps duobinary-4-PAM for High-Performance Access Networks" Asia Communications and Photonics Conference 2014, ATh3A.161, Shanghai, 2014.

[154] A. Gomez Gonzalvo, <u>J.J. Vegas Olmos</u>, I. Tafur Monroy, "Algorithm for Hybrid Optical Fiber-Wireless Photonic Channel Allocation for Millimeter-waveband 5G Networks", Asia Communications and Photonics Conference 2014, ATh3A.146, Shanghai, 2014.

[155] A. Cerqueira S. Jr., M. Sales, A. Caballero, <u>J. J. V. Olmos</u>, I. F. da Costa, L. G. da Silva, L. T. Manera, J. A. Diniz and I. T. Monroy, "Towards optically controlled reconfigurable antennas for mm-wave future wireless distribution systems," Submitted to ITS 2014 - International Telecommunications Symposium, Brazil, August, 2014.

[156] L. F. Suhr, <u>J.J. Vegas Olmos</u>, B. Mao, X. Xu, G. N. Liu, I. Tafur Monroy, "112-Gbit/s x 4-Lane Duobinary-4-PAM for 400GBase," Accepted for European Conference in Optical Communications, Cannes, September, 2014.

[157] I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, "Hybrid Fiber-Wireless Systems," *Invited paper* in OptoElectronics and Communication Conference, Melbourne, Australia, 2014.

[158] L. Cavalcante, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy, "'High Capacity Hybrid Optical Fiber-Wireless Links in 75-300 GHz Band," *Invited paper*, 2014 IEEE International Conference on Ultra-Wideband, Paris, September, 2014.

[159] L.F. Suhr, <u>J.J. Vegas Olmos</u>, C. Peucheret, and I. Tafur Monroy, "Direct Modulation and Detection Link using Polybinary Signaling," Accepted, OptoElectronics and Communication Conference, OECC, paper TH11B, Melbourne, Australia, 2014.

[160] S. Spolitis, <u>J.J. Vegas Olmos</u>, V. Bobrovs, G. Ivanovs, and I. Tafur Monroy, "A novel approach for transmission of 56 Gbit/s NRZ signal in access network using spectrum slicing technique," Asia Communications and Photonics Conference, paper AF4D.2 , November, 2013.

[161]   L.F. Suhr, <u>J.J. Vegas Olmos</u>, J.M. Estaran, and I. Tafur Monroy, "Enabling low latency video distribution directly on the physical layer in passive optical networks," Asia Communications and Photonics Conference, paper AF1G.2, November, 2013.

[162] B. Li, Knud J. Larsen, <u>J.J. Vegas Olmos</u>, D. Zibar and I. Tafur Monroy, "Application of Beyond Bound Decoding for High Speed Optical Communication," Asia Communications and Photonics Conference, paper AF4C.6, November, 2013.

[163] X. Pang, A. Caballero, L. Deng, X. Yu, R. Borkowski, V. Arlunno, A. Dogadaev, D. Zibar, L. F. Suhr, <u>J. J. Vegas Olmos</u>, I. Tafur Monroy, "100-Gbps hybrid optical fiber-wireless transmission," Invited paper, OptoElectronics and Communication Conference, Kyoto, paper ThP3.1, Japan, 2013.

[164] X. Pang, <u>J.J. Vegas Olmos</u>, A. Lebedev, and I. Tafur Monroy, "A Multi-gigabit W-Band Bidirectional Seamless Fiber-Wireless Transmission System with Simple Structured Access Point," European Conference on Optical Communications, paper P6.11, September 2013.

[165] X. Pang, A. Lebedev, <u>J.J. Vegas Olmos</u>, and I. Tafur Monroy, "Seamless Optical Fiber-Wireless Millimeter-Wave Transmission Link for Access Networks," OECC 2013, Kyoto, paper TuPP.2, Japan.

[166] G. Arturo Rodés López, J. Estaran, J.J. Vegas Olmos, and I. Tafur Monroy, "Energy Saving Scheme based on Traffic Forwarding for Optical Fiber Access Networks," OECC 2013, Kyoto, paper ThP1.1, Japan.

[167] A. Lebedev, X. Pang, J. J. Vegas Olmos, M. Beltrán, R. Llorente, S. Forchhammer, I. Tafur Monroy, "Fiber supported 60 GHz mobile backhaul links for metro/suburban deployment," ONDM 2013, pp. 190-193, Brest, France, 2013.

[168] X. Pang, A. Lebedev, J.J. Vegas Olmos, M. Beltrán, R. Llorente and I. Tafur Monroy, "Performance Evaluation for DFB and VCSEL-based 60 GHz Radio-over-Fiber System," ONDM 2013, pp. 252 – 256, Brest, France.

[169] A. Lebedev, X. Pang, J.J. Vegas Olmos, I. Tafur Monroy, S. Forchhammer, "Tunable photonic RF generator for dynamic allocation and multicast of 1.25 Gbps channels in the 60 GHz unlicensed band," IEEE International Microwave Symposium, Seattle, USA, June 2013.

[170] X. Pang, M. Beltrán, J. Sánchez, E. Pellicer, J.J. Vegas Olmos, R. Llorente, and I. Tafur Monroy, "DWDM Fiber-Wireless Access System with Centralized Optical Frequency Comb-based RF Carrier Generation," Conference on Optical Fiber Communication (OFC), collocated with National Fiber Optic Engineers Conference, (OFC/NFOEC), paper JTh2A.56, 2013.

[171] A. Lebedev, R. Rodes, X. Yu, J.J. Vegas Olmos, I. Tafur Monroy, S. Forchhammer, "Simplified Fiber-Wireless Distribution of HD Video in Passive and Active W-band Close Proximity Terminals," Fiber Optics in Access Networks (FOAN) 2012, *Best Paper Award*, St. Petersburg, Russia, October, 2012.

[172] J. Estaran, J. J. Vegas Olmos, A. Rodes, I. Tafur Monroy, "Bidirectional uncompressed HD video distribution over fiber employing VCSELs," IEEE Photonics Conference, paper ME1, San Francisco, 2012.

[173] A. Lebedev, J. J. Vegas Olmos, M. Iglesias, S. Forchhammer, I. Tafur Monroy, "Enabling uncompressed video transmission in double-sideband 60 GHz radio-over-fiber links," IEEE Photonics Conference, paper WS2, San Francisco, 2012.

[174] G.A. Rodes, J.J. Vegas Olmos, F. Karinou, I. Roudas, L. Deng, X. Pang, and I. Tafur Monroy, "Optical Switching for Dynamic Distribution of Wireless-over-Fiber Signals," IEEE 16th International Conference on Optical Network Design and Modeling (ONDM) 2012, Essex, UK, 2012.

[175] H. Toda, J.J. Vegas Olmos, T. Kuri, K. Kitayama, "High-capacity fiber-radio systems and networks," *Invited Paper*, IEEE 2011 Photonics Conference, Arlington, Virginia, USA, October 2011.

[176] T. Kuri, J.J. Vegas Olmos, C.P. Tsekrekos, H. Toda, and K.-I. Kitayama, "Reconfigurable DWDM Radio-over-Fiber networks for wireless and wired signal convergence," *Invited paper*, 2010 Asia-Pacific Radio Science Conference AP-RASC, Toyama, Japan, 2010.

[177] T. Kuri, J.J. Vegas Olmos, H. Toda, and K.-I. Kitayama, "Wired and Wireless Integrated DWDM Networks and Millimeter-Wave-Band RoF Technologies," *Invited paper*, 22nd Annual Lasers and Electro Optics Society Meeting, LEOS 2009, ThI 2, Turkey, 2009.

[178] T. Kuri, H. Toda, J.J. Vegas Olmos, and K. Kitayama, "Fiber-Wireless DWDM Networks and Radio-over-Fiber Technologies," *Invited Paper*, Microwave Photonics, MWP 2009, Valencia, Spain, October 2009.

[179] M. Tokushima, J.J. Vegas Olmos, and Ken-ichi Kitayama, "Silicon nano devices towards ultra-high performance photonic nodes," Proceedings of the IEICE General Conference, paper CS-9-10, 2009.

[180] M. Tokushima, J. J. Vegas Olmos, and Ken-ichi Kitayama, "Integrated optical delay element based on multi-mode Si-wire waveguide," 56th Japan Society of Applied Physics JSAP, Paper 1P-B-3, Spring meeting, Tsukuba, Japan, March/April 2009.

[181] Ken-ichi Kitayama, <u>J. J. Vegas Olmos</u>, Toshiaki Kuri, and Hiroyuki Toda, "DWDM Analog Radio-over-Fiber/Digital FTTH Hybrid Access Networking and Its Enabling Technologies," APOC 2008 Hangzhou, China, Invited Paper, 26-30 October 2008.

[182] K-I. Kitayama, T. Kuri, <u>J.J. Vegas Olmos</u>, H. Toda, "Fiber-wireless networks and radio-over-fibre technique," Conference on Lasers and Electro-Optics, Quantum Electronics and Lasers Conference (CLEO/QELS 2008), CThR4, San Jose (May 2008).

[183] T. Kuri, <u>J.J. Vegas Olmos</u>, and K. Kitayama, "Reconfigurable DWDM Network for 60-GHz-Band Radio-over-Fiber Access," 1st Japanese Technical Meeting MWP, 3rd December, Yokohama, Japan, 2007.

[184] K.-I. Kitayama, T. Kuri, H. Toda, and <u>J.J. Vegas Olmos</u>, "Radio over Fiber: DWDM Analog/digital Access Network and its Enabling Technologies," LEOS annual meeting 2007, *Invited paper*, Th01, pp. 794-795, Florida, USA, October 2007.

[185] T. Kuri, <u>J.J. Vegas Olmos</u>, and K. Kitayama, ``Photonic dynamic channel allocation in optical-frequency-interleaved DWDM millimeter-wave-band radio-over-fiber access network,'' in 2007 IEEE International Topical Meeting on Microwave Photonics (MWP2007) Tech. Dig., Victoria, BC, Canada, F-2.4, pp.249-252, Oct. 3-5, 2007.

[186] M. Garcia Larrode, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, and E.J.M. Verdurmen, "OFM performance in a basic MMF dropping node for Radio-over-MMF ring/bus distribution antenna system," AP-MWP 2007, Session J3, pp. 25-27, Korea, April 2007.

[187] N. Chi, D. Huang, <u>J.J. Vegas Olmos</u>, S. Yu, "All-optical packet compression by using the active vertical coupler based optical crosspoint switch matrix," IEEE/LEOS Annual Meeting, Paper WG2, Montreal, Canada, 2006.

[188] M. Garcia Larrode, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, "Transmission of Microwave Signals beyond the Modal Bandwidth of Multimode Fiber Links," Topical meeting on Microwave Photonics, MWP'06, pp. 1-4, Grenoble, France, 2006.

[189] Nan Chi, Ronelle Geldenhuys, <u>J.J. Vegas Olmos</u>, Zhuoran Wang, Jacobus S. Merwe, Kornkamol Thakulsukananta, Siyuan Yu , "Alleviation of the pattern effect in a crosspoint-switch based optical buffer," APOC 2006, pp. 1-2, Gwangju, Korea, 2006.

[190] J. M. D. Mendinueta, I. Tafur Monroy, <u>J.J. Vegas Olmos</u>, N. Yan,   Y. Dimitriadis, and A.M.J. Koonen, "Traffic performance study of an all-optical label swapping core node and a full network topology," European Conference on Networks and Optical Communications, NOC 2006, pp. 387-394, 11-13 July, Berlin, 2006.

[191] M. Garcia Larrode, A.M.J. Koonen, and <u>J.J. Vegas Olmos</u>, "WDM radio-over-fiber distribution antenna system employing Optical Frequency Multiplication," OFC 2006, Anaheim, Los Angeles, OFM2, 2006.

[192] I. Tafur Monroy, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, N. Yan, J.J. Jennen, C. Peucheret, and E. van Breusegem, "Optical label switching functionalities employing semiconductor optical amplifiers," Invited paper OTuA3, Optical Amplifiers and their Applications (OAA) 2006, Whistler, Canada, 2006.

[193] M. Garcia Larrode, A.M.J. Koonen, <u>J.J. Vegas Olmos</u>, G.-J. Rijckenberg, L. Dang Bao, I. Niemegeers, "Transparent transport of wireless communication signals in radio- over-fibre systems," proc. NOC 2005 pp. 83-90 London, UK NOC 2005.

[194] Ton Koonen, Idelfonso Tafur Monroy, <u>J.J. Vegas Olmos</u>, Jos van der Tol, Evi Zouganeli, Erik van Breusegem, Geert Morthier, Jean Jennen, Christophe Peucheret, Tommy Mullane, Kristian Blidegn, Peter Raaby, "Optical Label Switched Networks – the FP5-IST STOLAS project," In proceedings of the NOC 2005, pp. 391-398, July 5-7, London, England, 2005.

[195] J. van Berkel, J.J. Vegas Olmos, I. Tafur Monroy, A.M.J. Koonen, "Influence of Non-optimal Filtering on FSK/IM Modulated Signals," In proceeding of ECOC 2005, Th3.4.5., Glasgow, 2005.

[196] A.M.J. Koonen, J.J. Vegas Olmos, I. Tafur Monroy, J.G.J. Jennen, C. Peucheret, E. van Breusegem, "Optical packet routing using orthogonal labeling – results from the FP5 STOLAS project," In proceeding of ECOC 2005, Mo.4.4.1., Glasgow, 2005.

[197] J.P. Turkiewicz, J.J. Vegas Olmos, G.D. Khoe and H. de Waardt, "Performance assessment of the 1310 to 1550 nm wavelength conversion," In proceeding of ECOC 2005, We.1.5.3., Glasgow, 2005.

[198] M. García Larrodé, A.M.J. Koonen, J.J. Vegas Olmos, I. Tafur Monroy, T.C.W. Schenk, "RF Bandwidth Capacity and SCM in a Radio-over-Fibre Link Employing Optical Frequency Multiplication," In proceeding of ECOC 2005, We.4.P.090., Glasgow, 2005.

[199] R. Sanz , I. Tafur Monroy, J.J. Vegas Olmos, A.M.J. Koonen , "Performance analysis of an OLS STOLAS node and its scalability," In proceedings of the NOC 2005, pp. 399-406, July 5-7, London, England, 2005.

[200] J.P.A. van Berkel, J.J. Vegas Olmos, I. Tafur Monroy and A.M.J. Koonen,   "Effect of non-optimal filtering on the performance of FSK/IM transmission schemes," In proceedings of the NOC 2005, pp. 423-430, July 5-7, London, England, 2005.

[201] C. Diaz Gimenez, I. Tafur Monroy, J.J. Vegas Olmos, S. Sales,   A.M.J. Koonen, "Performance evaluation of a DPSK/SCM combined modulation scheme for optical label switching," In proceedings of the NOC 2005, pp. 415-422, July 5-7, London, England, 2005.

[202] T. Flarup, C. Peucheret, J.J. Vegas Olmos, Y. Geng, J. Zhang, I. Tafur Monroy, P. Jeppesen, "Labeling of 40 Gbit/s DPSK Payload using In-band Subcarrier Multiplexing," OFC 2005, Anaheim, Los Angeles, OWB7, 2005.

[203] J. P. Turkiewicz, J. J. Vegas Olmos, G. D. Khoe, and H. de Waardt, "1310-nm to 1550-nm Wavelength Conversion by Utilizing Nonlinear Polarization Rotation in a Semiconductor Optical Amplifier," OFC 2005, Anaheim, Los Angeles, OME48, 2005.

[204] J.P. Turkiewicz, J.J. Vegas Olmos, A.M.J. Koonen, G.D. Khoe, and H. de Waardt, "All-optical 1310-to-1550 nm wavelength conversion including transmission over two fibre links," In Proceedings of IEEE/LEOS Benelux Annual Symposium 2005, Mons, Belgium, December 1-2, pp. 189-192, 2005.

[205] J.P.A. van Berkel, J.J. Vegas Olmos, I. Tafur Monroy, and A.M.J. Koonen "Influence of laser wavelength detuning and optical filtering on the performance of FSK/IM transmission schemes," In Proceedings of IEEE/LEOS Benelux Annual Symposium 2004, Genth, Belgium, December 2-3 , pp. 191-194, 2004.

[206] M.I. Macias, J.P. Turkiewicz, J.J. Vegas Olmos, A.M.J.Koonen and I. Tafur Monroy, "A novel data vortex switch for photonic slot routing", Proceedings ECOC 2003 conference, 21-25 September 2003, Rimini, Italy, 2003, Tu1 4.2.

[207] A.M.J. Koonen, I. Tafur Monroy, J.J. Vegas Olmos, H. de Waardt, G.D. Khoe, "The expected impact of new optical technologies on communication networks", proc. NOC 2003, 1-3 July 2003, ISBN 3-905084-69-4, ed. H.R. van As; D.W. Faulkner; AKM AG, Basel, 2003, pp. 1-8.

[208] I. Tafur Monroy, J. Zhang, Nan Chi, P.V. Holm-Nielsen, C. Peucheret, A.M.J. Koonen, J.J. Vegas Olmos, G-D Khoe, "Techniques for labeling of optical signals in burst switched networks", Opticomm 2003, 1st.Workshop on Optical Burst Switching, pp.1-11, Dallas, USA, October.

[209] I. Tafur Monroy, M. Martinez Chisvert, J.J. Vegas Olmos, A. M. J. Koonen, "Error-correcting Coding for IM/FSK Modulation Format for Optical Labeling of Signals", Proceedings of ONDM 2004,ISBN-N 9076546029, pp. 381-388, February 2-4 2004, Gent, Belgium.

[210] P. V. Holm-Nielsen, J. Zhang, J. J. Vegas Olmos, I. Tafur Monroy, C. Peucheret, V. Polo, P. Jeppesen, A.M.J. Koonen and J. Prat, "Experimental investigation of WDM transmission properties of optical labeled signals using orthogonal IM/FSK modulation format", International Conference on Telecommunications, ICT'04, Fortaleza, Brazil, pp.753-759, 2004.

[211] Nan Chi, P. V. Holm-Nielsen, P. Jeppesen, C. Peucheret, Jianfeng Zhang, J. J. Vegas Olmos and I. Tafur Monroy, "Optical Label Swapping of Payloads up to 40 Gb/s Using an Orthogonally Modulated Label, " IEEE/LEOS Annual Meeting' 2004, Puerto Rico, Vol. 2, 7-11 Nov., pp. 851-852, paper FO6, 2004.

[212] P. Munoz, I. Tafur Monroy, R. Garcia, J.J. Vegas Olmos, F.M. Huijskens, S. Sales, A. Gonzalez, J. Capmany, A.M.J. Koonen, "Novel optical direct detection scheme for DPSK signals using Fibre Bragg Gratings," In Proceedings of Opnetec 2004, Pisa, Italy, October 18-20, pp. 601-606, 2004.

[213] M.I. Macias, J.P.Turkiewicz, J.J. Vegas Olmos, A.M.J.Koonen and I. Tafur Monroy, "High-throughput, self-routing, optical switch for photonic slot routing," proc. London Communications Symposium 2003, 8-9 September 2003, ISBN 0-0538863-2-6; Communications Engineering Doctorate Centre, University College London, 2003, pp. 249-253.

Joachim Oberhammer

Joachim Oberhammer, born in Italy in 1976; M.Sc. EE from Graz University of Technology, Austria, in 2000; Ph.D. from KTH Royal Institute of Technology in Stockholm, Sweden, in 2004. Post-doctoral research fellow at Nanyang Technological University, Singapore, in 2004, and at Kyoto University, Japan, in 2008. Since 2005 leading radio-frequency/microwave/terahertz micro-electromechanical systems research at KTH; Associate Professor at KTH in 2010; Professor in Microwave and THz Microsystems at KTH since 2015. Guest researcher at Nanyang Technological University, Singapore, in 2007; guest researcher at NASA-Jet Propulsion Laboratory, USA, in 2014.

Research field: radio-frequency to terahertz microsystems, RF/microwave micro-electromechanical systems (RF MEMS), THz MEMS

He is author and co-author of more than 100 reviewed research papers and holds 4 patents. In 2004, 2007, and 2008 he got an award by the Ericsson Research Foundation, a grant by the Swedish Innovation Bridge, and a scholarship by the Japanese Society for the Promotion of Science, respectively. The research work he is heading received six Best Paper Awards (five of which at IEEE conferences), and four IEEE Graduate Fellowship Awards (by MTT-S and by AP-S) since 2009. He served as TPRC member of IEEE Transducers 2009 and 2015, IEEE International Microwave Symposiums 2010-2016, IEEE Micro Electro Mechanical Systems 2011 and 2012, and IEEE Radio and Wireless Week 2015 and 2016. Dr Oberhammer is Steering Group member of the IEEE MTT-S and AP-S Chapers Sweden since 2009. In 2013, he received an ERC Consolidator Grant by the European Research Council. Since 2014 he is Steering Group Member of the Young Academy of Sweden. Since 2016 he is member of the General Assembly of the European Microwave Association.

Publications

Peer reviewed

Articles

[1]

U. Shah *et al.*, "A 500-750 GHz RF MEMS Waveguide Switch," *IEEE Transactions on Terahertz Science and Technology,* vol. 7, no. 3, 2017.

[2]

U. Shah *et al.*, "Submillimeter-Wave 3.3-bit RF MEMS Phase Shifter Integrated in Micromachined Waveguide," *IEEE Transactions on Terahertz Science and Technology,* vol. 6, no. 5, pp. 706-715, 2016.

[3]

S. J. Bleiker *et al.*, "High-Aspect-Ratio Through Silicon Vias for High-Frequency Application Fabricated by Magnetic Assembly of Gold-Coated Nickel Wires," *IEEE Transactions on Components, Packaging, and Manufacturing Technology,* vol. 5, no. 1, pp. 21-27, 2015.

[4]

F. Töpfer, S. Dudorov and J. Oberhammer, "Millimeter-Wave Near-Field Probe Designed for High-Resolution Skin Cancer Diagnosis," *IEEE transactions on microwave theory and techniques,* vol. 63, no. 6, pp. 2050-2059, 2015.

[5]

F. Töpfer and J. Oberhammer, "Millimeter-Wave Tissue Diagnostics : The most promising fields for medical applications,"*IEEE Microwave Magazine,* vol. 16, no. 4, pp. 97-113, 2015.

[6]

U. Shah, M. Sterner and J. Oberhammer, "Analysis of Linearity Deterioration in Multidevice RF MEMS Circuits," *IEEE Transactions on Electron Devices,* vol. 61, no. 5, pp. 1529-1535, 2014.

[7]

D. Dancila *et al.,* "Millimeter wave silicon micromachined waveguide probe as an aid for skin diagnosis - results of measurements on phantom material with varied water content," *Skin research and technology,* vol. 20, no. 1, pp. 116-123, 2014.

[8]

U. Shah *et al.,* "Permeability Enhancement by Multilayer Ferromagnetic Composites for Magnetic-Core On-Chip Inductors,"*IEEE Microwave and Wireless Components Letters,* vol. 24, no. 10, pp. 677-679, 2014.

[9]

T. Ebefors and J. Oberhammer, "Through-Silicon Vias and 3D Inductors for RF Applications," *Microwave journal (International ed.),* vol. 57, no. 2, p. 80, 2014.

[10]

Z. Baghchehsaraei *et al.,* "Waveguide-integrated MEMS-based phase shifter for phased array antenna," *IET Microwaves, Antennas & Propagation,* vol. 8, no. 4, pp. 235-243, 2014.

[11]

U. Shah, M. Sterner and J. Oberhammer, "High-Directivity MEMS-Tunable Directional Couplers for 10–18-GHz Broadband Applications," *IEEE transactions on microwave theory and techniques,* vol. 61, no. 9, pp. 3236-3246, 2013.

[12]

Z. Baghchehsaraei *et al.,* "Integration of microwave MEMS devices into rectangular waveguide with conductive polymer interposers," *Journal of Micromechanics and Microengineering,* vol. 23, no. 12, p. 125020, 2013.

[13]

Z. Baghchehsaraei *et al.,* "MEMS reconfigurable millimeter-wave surface for V-band rectangular-waveguide switch,"*International Journal of Microwave and Wireless Technologies,* vol. 5, no. 3, pp. 341-349, 2013.

[14]

U. Shah, M. Sterner and J. Oberhammer, "Multi-Position RF MEMS Tunable Capacitors Using Laterally Moving Sidewalls of 3-D Micromachined Transmission Lines," *IEEE transactions on microwave theory and techniques,* vol. 61, no. 6, pp. 2340-2352, 2013.

[15]

Z. Baghchehsaraei and J. Oberhammer, "Parameter Analysis of Millimeter-Wave Waveguide Switch Based on a MEMS-Reconfigurable Surface," *IEEE transactions on microwave theory and techniques,* vol. 61, no. 12, pp. 4396-4406, 2013.

[16]

M. Sterner and J. Oberhammer, "Symmetrical Anti-Directional Metallization for Stress-Compensation of Transfer-Bonded Monocrystalline Silicon Membranes," *Journal of microelectromechanical systems,* vol. 22, no. 1, pp. 195-205, 2013.

[17]

N. Somjit and J. Oberhammer, "Three-dimensional micromachined silicon-substrate integrated millimetre-wave helical antennas," *IET Microwaves, Antennas & Propagation,* vol. 7, no. 4, pp. 291-298, 2013.

[18]

N. Somjit and J. Oberhammer, "Design Approach for Return-Loss Optimisation of Multi-Stage Millimetre-Wave MEMS Dielectric-Block Phase Shifters," *IET Microwaves, Antennas & Propagation,* vol. 6, pp. 1429-1436, 2012.

[19]

D. Chicherin *et al.,* "Analog-type millimeter-wave phase shifters based on MEMS tunable high-impedance surface and dielectric rod waveguide," *International Journal of Microwave and Wireless Technologies,* vol. 3, no. 5, pp. 533-538, 2011.

[20]

M. Sterner *et al.,* "Electrochemically Assisted Maskless Selective Removal of Metal Layers for Three-Dimensional Micromachined SOI RF MEMS Transmission Lines and Devices," *Journal of microelectromechanical systems,* vol. 20, no. 4, pp. 899-908, 2011.

[21]

M. Sterner *et al.,* "Microwave MEMS Devices Designed for Process Robustness and Operational Reliability," *International Journal of Microwave and Wireless Technology,* vol. 3, no. 5, pp. 547-563, 2011.

[22]

N. Somjit, G. Stemme and J. Oberhammer, "Power Handling Analysis of High-Power W-Band All-Silicon MEMS Phase Shifters," *IEEE Transactions on Electron Devices,* vol. 58, no. 5, pp. 1548-1555, 2011.

[23]

N. Somjit, G. Stemme and J. Oberhammer, "Deep-Reactive-Ion-Etched Wafer-Scale-Transferred All-Silicon Dielectric-Block Millimeter-Wave MEMS Phase Shifters," *Journal of microelectromechanical systems,* vol. 19, no. 1, pp. 120-128, 2010.

[24]

M. Sterner *et al.,* "Static Zero-Power-Consumption Coplanar Waveguide Embedded DC-to-RF Metal-Contact MEMS Switches in Two-Port and Three-Port Configuration," *IEEE Transactions on Electron Devices,* vol. 57, no. 7, pp. 1659-1669, 2010.

[25]

N. Somjit, G. Stemme and J. Oberhammer, "Binary-Coded 4.25-bit W-Band Monocrystalline-Silicon MEMS Multistage Dielectric-Block Phase Shifters," *IEEE transactions on microwave theory and techniques,* vol. 57, no. 11, pp. 2834-2840, 2009.

[26]

F. Ke, J. Miao and J. Oberhammer, "A Ruthenium-Based Multimetal-Contact RF MEMS Switch With a Corrugated Diaphragm," *Journal of microelectromechanical systems,* vol. 17, no. 6, pp. 1447-1459, 2008.

[27]

M. Tang, A. Q. Liu and J. Oberhammer, "A silicon-on-glass single-pole-double-throw (SPDT) switching circuit integrated with a silicon-core metal-coated transmission line," *Journal of Micromechanics and Microengineering,* vol. 18, no. 9, 2008.

[28]

S. Braun, J. Oberhammer and G. Stemme, "Row/column addressing scheme for large electrostatic actuator MEMS switch arrays and optimization of the operational reliability by statistical analysis," *Journal of microelectromechanical systems,* vol. 17, no. 5, pp. 1104-1113, 2008.

[29]

S. Braun, J. Oberhammer and G. Stemme, "Single-chip MEMS 5x5 and 20x20 double-pole single-throw switch arrays for automating telecommunication networks," *Journal of Micromechanics and Microengineering,* vol. 18, no. 1, p. 015014, 2008.

[30]

A. B. Yu *et al.*, "Characterization and optimization of dry releasing for the fabrication of RF MEMS capacitive switches,"*Journal of Micromechanics and Microengineering,* vol. 17, no. 10, pp. 2024-2030, 2007.

[31]

P. Gkotsis *et al.*, "Thin film crystal growth template removal : Application to stress reduction in lead zirconate titanate microstructures," *Applied Physics Letters,* vol. 91, no. 16, 2007.

[32]

J. Oberhammer, A. Q. Liu and G. Stemme, "Time-efficient quasi-static algorithm for simulation of complex single-sided clamped electrostatic actuators," *Journal of microelectromechanical systems,* vol. 16, no. 2, pp. 373-382, 2007.

[33]

J. Oberhammer and G. Stemme, "Active opening force and passive contact force electrostatic switches for soft metal contact materials," *Journal of microelectromechanical systems,* vol. 15, no. 5, pp. 1235-1242, 2006.

[34]

J. Oberhammer *et al.*, "Mechanically tri-stable, true single-pole-double-throw (SPDT) switches," *Journal of Micromechanics and Microengineering,* vol. 16, no. 11, pp. 2251-2258, 2006.

[35]

J. Oberhammer and G. Stemme, "BCB contact printing for patterned adhesive full-wafer bonded 0-level packages," *Journal of microelectromechanical systems,* vol. 14, no. 2, pp. 419-425, 2005.

[36]

J. Oberhammer and G. Stemme, "Design and fabrication aspects of an S-shaped film actuator based DC to RF MEMS switch," *Journal of microelectromechanical systems,* vol. 13, no. 3, pp. 421-428, 2004.

[37]

J. Oberhammer and G. Stemme, "Low-voltage high-isolation DC-to-RF MEMS switch based on an S-shaped film actuator,"*IEEE Transactions on Electron Devices,* vol. 51, no. 1, pp. 149-155, 2004.

[38]

J. Oberhammer, F. Niklaus and G. Stemme, "Sealing of adhesive bonded devices on wafer level," *Sensors and Actuators A-Physical,* vol. 110, no. 1-3, pp. 407-412, 2004.

[39]

J. Oberhammer, F. Niklaus and G. Stemme, "Selective wafer-level adhesive bonding with benzocyclobutene for fabrication of cavities," *Sensors and Actuators A-Physical,* vol. 105, no. 3, pp. 297-304, 2003.

Conference papers

[40]

U. Shah *et al.*, "500-550 GHz Waveguide Integrated RF MEMS Phase Sifter," in *GigaHertz Symposium 2016, Swedish Microwave days. 15-16 March.,* 2016.

[41]

U. Shah *et al.*, "500-750 GHz submillimeter-wave MEMS waveguide switch," in *2016 IEEE MTT-S International Microwave Symposium (IMS),* 2016.

[42]

F. Töpfer, L. Emtestam and J. Oberhammer, "Diagnosis of malignant melanoma by micromachined near-field millimeter-wave probe," in *International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz,* 2016.

[43]

U. Shah *et al.*, "Micromachined Waveguide Integrated RF MEMS Switch Operating between 500-750 GHz," in *The 17th edition of the International Symposium on RF-MEMS and RF-MICROSYSTEMS (MEMSWAVE 2016)*, 2016.

[44]
J. Oberhammer, "THz MEMS - Micromachining enabling new solutions at millimeter and submillimeter frequencies," in *2016 Global Symposium on Millimeter Waves, GSMM 2016 and ESA Workshop on Millimetre-Wave Technology and Applications*, 2016.

[45]
J. Liljeholm *et al.*, "Through-Glass-Via Enabling Low Loss High-Linearity RF Components," in *11th Micronano System Workshop 2016 (MSW 2016)*, 2016.

[46]
U. Shah *et al.*, "500-600 GHz RF MEMS Based Tunable Stub Integrated in Micromachined Rectangular Waveguide," in *2015 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM (IMS)*, 2015.

[47]
U. Shah *et al.*, "500-600 GHz Submillimeter-Wave 3.3 bit RF MEMS Phase Shifter Integrated in Micromachined Waveguide," in *Microwave Symposium (IMS), 2015 IEEE MTT-S International*, 2015, pp. 1-4.

[48]
U. Shah *et al.*, "Micromachined Waveguide Integrated RF MEMS Phase Sifter Operating between 500-600 GHz," in *16th edition of the International Symposium on RF-MEMS and RF-MICROSYSTEMS. 29 june -1 July*, 2015.

[49]
J. Liljeholm *et al.*, "Multilayer ferromagnetic composites enabling on-chip magnetic-core inductors beyond 1 GHZ," in *Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS), 2015 Transducers - 2015 18th International Conference on*, 2015, pp. 811-814.

[50]
F. Töpfer, L. Emtestam and J. Oberhammer, "Dermatological verification of micromachined millimeter-wave skin-cancer probe," in *IEEE MTT-S International Microwave Symposium Digest*, 2014.

[51]
Z. Baghchehsaraei and J. Oberhammer, "MEMS-reconfigurable wavguide iris for switchable V-band cavity resonators," in *2014 IEEE 27th International Conference on Micro Electro Mechanical Systems (MEMS)*, 2014, pp. 206-209.

[52]
Z. Baghchehsaraei, J. Åberg and J. Oberhammer, "Mems-reconfigurable millimeter-wave surfaces for waveguide switches, irises and resonators," in *The GigaHertz 2014 Symposium*, 2014.

[53]
F. Töpfer, S. Dudorov and J. Oberhammer, "2-Dimensional near-field millimeter-wave scanning with micromachined probe for skin cancer diagnosis," in *Micro Electro Mechanical Systems (MEMS), 2013 IEEE 26th International Conference on*, 2013, pp. 1057-1060.

[54]
U. Shah, M. Sterner and J. Oberhammer, "Analysis of linearity degradation in multi-stage RF MEMS circuits," in *Micro Electro Mechanical Systems (MEMS), 2013 IEEE 26th International Conference on*, 2013, pp. 749-752.

[55]
U. Shah and J. Oberhammer, "Characterization of High-Q Laterally Moving RF MEMS Tuneable Capacitor," in *European Microwave Week 2013, EuMW 2013 - Conference Proceedings; EuMC 2013 : 43rd European Microwave Conference*, 2013, pp. 1323-1326.

[56]
F. Töpfer *et al.*, "Micromachined near-field millimeter-wave medical sensor for skin cancer diagnosis," in *2013 7th European Conference on Antennas and Propagation (EuCAP)*, 2013, pp. 1550-1553.

[57]
Z. Baghchehsaraei *et al.*, "Millimeter-Wave SPST Waveguide Switch Based on Reconfigurable MEMS Surface," in *2013 IEEE MTT-S International Microwave Symposium Digest (IMS)*, 2013, p. 6697774.

[58]
J. Oberhammer *et al.*, "Monocrystalline-Silicon Microwave MEMS," in *Proceedings of PIERS 2013 in Stockholm, August 12-15, 2013*, 2013, pp. 1933-1941.

[59]
U. Shah, M. Sterner and J. Oberhammer, "Nonlinearity Determination and Linearity Degradation in RF MEMS Multi-Device Circuits," in *14th International Symposium on RF MEMS and RF Microsystems (MEMSWAVE 2013); Potsdam, Germany, July 1-3, 2013*, 2013.

[60]
Z. Baghchehsaraei and J. Oberhammer, "V-Band Single-Pole-Single-Throw Mems Rectangular waveguide Switch," in *MME 2013 24th Micromechanics and Microsystems Europe Conference*, 2013.

[61]
U. Shah, M. Sterner and J. Oberhammer, "Basic Concept of Tuneable MEMS Directional Couplers for Ultra-Wideband Applications," in *13th International Symposium on RF MEMS and RF Microsystems (MEMSWAVE 2012),02-04 July 2012, Antalya, Turkey*, 2012.

[62]
U. Shah, M. Sterner and J. Oberhammer, "Compact MEMS reconfigurable ultra-wideband 10-18 GHz directional couplers," in *Proceedings of the IEEE International Conference on Micro Electro Mechanical Systems (MEMS)*, 2012, pp. 684-687.

[63]
A. Vorobyov *et al.*, "Iris-based 2-bit waveguide phase shifters and transmit-array for automotive radar applications," in *Proceedings of 6th European Conference on Antennas and Propagation, EuCAP 2012*, 2012, pp. 3711-3715.

[64]
Z. Baghchehsaraei *et al.*, "MEMS 30μm-thick W-band Waveguide Switch," in *European Microwave Week 2012: "Space for Microwaves", EuMW 2012, Conference Proceedings - 7th European Microwave Integrated Circuits Conference, EuMIC 2012*, 2012, pp. 675-678.

[65]
F. Töpfer, S. Dudorov and J. Oberhammer, "Micromachined 100GHz near-field measurement probe for high-resolution microwave skin-cancer diagnosis," in *IEEE MTT-S International Microwave Symposium Digest : 2012 IEEE MTT-S International Microwave Symposium, IMS 2012; Montreal, QC; Canada; 17 June 2012 through 22 June 2012*, 2012, p. 6259671.

[66]
S. Dudorov, F. Töpfer and J. Oberhammer, "Micromachined-silicon W-band planar-lens antenna with metamaterial free-space matching," in *Microwave Symposium Digest (MTT), 2012 IEEE MTT-S International*, 2012, p. 6259654.

[67]
Z. Baghchehsaraei *et al.*, "PHASED-ARRAY ANTENNA BASED ON MEMS FIN-LINE PHASESHIFTERS FOR W-BAND BEAM-STEERING APPLICATIONS," in *GigaHertz Symposium 2012*, 2012.

[68]

N. Somjit, G. Stemme and J. Oberhammer, "Performance optimization of multi-stage MEMS W-band dielectric-block phase-shifters," in *European Microwave Week 2012: "Space for Microwaves", EuMW 2012, Conference Proceedings - 7th European Microwave Integrated Circuits Conference, EuMIC 2012,* 2012, pp. 433-436.

[69]

Z. Du *et al.*, "Reflection phase characterization of the MEMS-based high impedance surface," in *European Microwave Week 2012: "Space for Microwaves", EuMW 2012, Conference Proceedings - 42nd European Microwave Conference, EuMC 2012,* 2012, pp. 617-620.

[70]

N. Somjit and J. Oberhammer, "Semiconductor-Substrate Integrated 3D-Micromachined W-Band Helical Antennas," in *Antennas and Propagation Society International Symposium (APSURSI), 2012 IEEE,* 2012, p. 6349415.

[71]

J. Ala-Laurinaho *et al.*, "TUMESA - MEMS tuneable metamaterials for smart wireless applications," in *European Microwave Week 2012: "Space for Microwaves", EuMW 2012, Conference Proceedings - 7th European Microwave Integrated Circuits Conference, EuMIC 2012,* 2012, pp. 95-98.

[72]

N. Somjit, G. Stemme and J. Oberhammer, "Thermal Characteristics and Power-Handling Capability of High-Power Millimeter-Wave MEMS Dielectric-Block Phase Shifters," in *Gigahertz Symposium 2012. Stockholm, Sweden. March 6-7 2012,* 2012.

[73]

G. E. H. Shhade *et al.*, "Antenne à ondes de fuite à balayage angulaireà fréquence fixe à 77GHz," in *17èmes Journées Nationales Micro-ondes,* 2011.

[74]

U. Shah, M. Sterner and J. Oberhammer, "Basic Concepts of Moving-Sidewall Tuneable Capacitors for RF MEMS Reconfigurable Filters," in *6th European Microwave Integrated Circuits (EuMIC) Conference,* 2011, pp. 526-529.

[75]

T. Zvolensky *et al.*, "Leaky-wave antenna at 77 GHz," in *Proceedings of the 41st European Microwave Conference,* 2011, pp. 1039-1042.

[76]

A. Vorobyov *et al.*, "MEMS based waveguide phase shifters for phased arrays in automotive radar applications," in *Proceedings of the 5th European Conference on Antennas and Propagation (EUCAP),* 2011, pp. 2087-2090.

[77]

U. Shah *et al.*, "MULTI-POSITION LARGE TUNING-RANGE DIGITALLY TUNEABLE CAPACITORS EMBEDDED IN 3D MICROMACHINED TRANSMISSION LINES," in *IEEE 24th International Conference on Micro Electro Mechanical Systems (MEMS), 2011,* 2011, pp. 165-168.

[78]

U. Shah, M. Sterner and J. Oberhammer, "Quasi-Analog Multi-Step Tuning of Laterally-Moving Capacitive Elements Integrated in 3D MEMS Transmission Lines," in *12th International Symposium on RF MEMS and RF Microsystems, Athens, June 27-29, 2011,* 2011.

[79]

D. Chicherini *et al.*, "Analog type millimeter wave phase shifters based on MEMS tunable high-impedance surface in rectangular metal waveguide," in *2010 IEEE MTT-S International Microwave Symposium : May 23-28, 2010, Anahaeim, California,* 2010, pp. 61-64.

[80]

N. Somjit, G. Stemme and J. Oberhammer, "Comparison of Thermal Characteristics of Novel RF MEMS Dielectric-Block Phase Shifter to Conventional MEMS Phase-Shifter Concepts," in *European Microwave Week 2010, EuMW2010 : Connecting the World, Conference Proceedings*, 2010, pp. 509-512.

[81]

N. Somjit, G. Stemme and J. Oberhammer, "Investigation of Power Handling Capability of Conventional and Novel All-Silicon RF MEMS Phase Shifters," in *11th International Symposium on RF MEMS and RF Microsystems (MEMSWAVE 2010). Otranto, Italy. June 28-30 2010*, 2010.

[82]

F. Saharil *et al.*, "LOW-TEMPERATURE CMOS-COMPATIBLE 3D-INTEGRATION OF MONOCRYSTALLINE-SILICON BASED PZT RF MEMS SWITCH ACTUATORS ON RF SUBSTRATES," in *MEMS 2010 : 23RD IEEE INTERNATIONAL CONFERENCE ON MICRO ELECTRO MECHANICAL SYSTEMS, TECHNICAL DIGEST*, 2010, pp. 47-50.

[83]

D. Chicherin *et al.*, "MEMS based high-impedance surface for millimetre wave dielectric rod waveguide phase shifter," in *European Microwave Week 2010, EuMW2010 : Connecting the World, Conference Proceedings - European Microwave Conference, EuMC 2010*, 2010, pp. 950-953.

[84]

D. Chicherin *et al.*, "MEMS tunable metamaterials surfaces and their applications," in *APMC 2010 : 2010 Asia-Pacific Microwave Conference proceedings : Dec. 7-10 Yokohama, Japan*, 2010, pp. 239-242.

[85]

J. Oberhammer, M. Sterner and N. Somjit, "Monocrystalline-Silicon Microwave MEMS Devices," in *Advanced Materials And Technologies For Micro/Nano-Devices, Sensors And Actuators*, 2010, pp. 89-100.

[86]

N. Somjit, G. Stemme and J. Oberhammer, "Novel Low-loss 4.25-Bit All-Silicon Millimeter-Wave MEMS Phase Shifters for High-Performance W-Band Applications," in *The 8th Micronano System Workshop. Stockholm, SWE. 04 May 2010 - 05 May 2010*, 2010.

[87]

U. Shah *et al.*, "RF MEMS tuneable capacitors based on moveable sidewalls in 3D micromachined coplanar transmission lines," in *Microwave Conference Proceedings (APMC), 2010 Asia-Pacific*, 2010, pp. 1821-1824.

[88]

N. Somjit, G. Stemme and J. Oberhammer, "Ultra-Wideband Low-loss All-Silicon MEMS Phase Shifters for High-Performance Electronic Beam-Steering Applications," in *GigaHertz Symposium 2010. Lund, SWE. March 9-10 2010*, 2010.

[89]

N. Somjit, G. Stemme and J. Oberhammer, "Novel concept of microwave mems reconfigurable 7X45° multi-stage dielectric-block phase shifter," in *Proceedings of the IEEE International Conference on Micro Electro Mechanical Systems*, 2009, pp. 15-18.

[90]

N. Somjit, G. Stemme and J. Oberhammer, "Phase Error and Nonlinearity Investigation of Millimeter-Wave MEMS 7-Stage Dielectric-Block Phase Shifters," in *2009 EUROPEAN MICROWAVE INTEGRATED CIRCUITS CONFERENCE (EUMIC 2009)*, 2009, pp. 519-522.

[91]

N. Somjit, G. Stemme and J. Oberhammer, "Phase Error and Nonlinearity Investigation of Millimeter-Wave MEMS 7-Stage Dielectric-Block Phase Shifters," in *2009 EUROPEAN MICROWAVE CONFERENCE : VOLS 1-3*, 2009, pp. 1872-1875.

[92]

M. Sterner *et al.*, "RF MEMS high-impedance tuneable metamaterials for millimeter-wave beam steering," in *Proceedings of the IEEE International Conference on Micro Electro Mechanical Systems,* 2009, pp. 896-899.

[93]

F. Ke, J. Miao and J. Oberhammer, "Ruthenium/Gold hard-surface/low-resistivity contact metallization for polymer-encapsulated microswitch with stress-reduced corrugated SIN/SIO2 diaphragm," in *Proceedings of the IEEE International Conference on Micro Electro Mechanical Systems,* 2009, pp. 860-863.

[94]

M. Sterner, G. Stemme and J. Oberhammer, "Wafer counter-bonding for integrating CTE-mismatched substrates and its application to MEMS tuneable metamaterials," in *TRANSDUCERS 2009 : 15th International Conference on Solid-State Sensors*, 2009, pp. 1722-1725.

[95]

M. Sterner *et al.*, "Maskless selective electrochemically assisted wet etching of metal layers for 3D micromachined SOI RF MEMS devices," in *MEMS 2008 : 21ST IEEE INTERNATIONAL CONFERENCE ON MICRO ELECTRO MECHANICAL SYSTEMS, TECHNICAL DIGEST*, 2008, pp. 383-386.

[96]

D. Chicherin *et al.*, "Micro-fabricated High-impedance Surface for Millimeter Wave Beam Steering Applications," in *33RD INTERNATIONAL CONFERENCE ON INFRARED, MILLIMETER AND TERAHERTZ WAVES : VOLS 1 AND 2*, 2008, pp. 574-576.

[97]

J. Oberhammer *et al.*, "Microwave MEMS activities at the Royal Institute of Technology," in *GigaHertz Symposium 2008. Göteborg, SWE. 5-6 March 2008,* 2008.

[98]

N. Somjit, G. Stemme and J. Oberhammer, "Novel RF MEMS Mechanically Tunable Dielectric Phase Shifter," in *33RD INTERNATIONAL CONFERENCE ON INFRARED, MILLIMETER AND TERAHERTZ WAVES : VOLS 1 AND 2*, 2008, pp. 643-644.

[99]

N. Somjit, G. Stemme and J. Oberhammer, "Reconfigurable Three-Dimensional Micromachined Dielectric-Loaded CPW Phase-Shifter," in *9th International Symposium on RF MEMS and RF Microsystems. Heraklion, Greece. 1-3 July 2008,* 2008.

[100]

D. Chicherin *et al.*, "Rectangular metal waveguide phase shifter controlled with MEMS high-impedance surface," in *Proc. of the XXXI Finnish URSI Convention on Radio Science Electromagnetics 2008,* 2008.

[101]

J. Oberhammer and G. Stemme, "Accuracy of quasi-static simulation methods as compared to full-dynamic analysis of nonlinear electrostatic MEMS actuators," in *PROCEEDINGS OF THE IEEE TWENTIETH ANNUAL INTERNATIONAL CONFERENCE ON MICRO ELECTRO MECHANICAL SYSTEMS : VOLS 1 AND 2*, 2007, pp. 5-8.

[102]

M. Sterner *et al.*, "Coplanar-waveguide embedded mechanically-bistable DC-to-RF MEMS switches," in *2007 IEEE/MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM DIGEST : VOLS 1-6*, 2007, pp. 359-362.

[103]

P. Gkotsis *et al.*, "Crystal growth template removal : application to stress reduction in PZT microstructures," in *Proc. International Symposium on Integrated Ferroelectrics 2007*, 2007.

[104]

M. Sterner *et al.*, "Deep-reactive-ion-etched 3D transmission lines with integrated mechanically multi-stable SPST and SPDT RF MEMS switches," in *Proc. International Symposium on RF MEMS and RF Microsystems MEMSWAVE 2007*, 2007.

[105]

S. Braun, J. Oberhammer and G. Stemme, "MEMS single-chip 5x5 and 20x20 double-switch arrays for telecommunication networks," in *IEEE 20th International Conference on Micro Electro Mechanical Systems, 2007. MEMS*, 2007, pp. 811-814.

[106]

M. Sterner *et al.*, "Mechanically bi-stable in-plane switch with dual-stiffness actuators," in *TRANSDUCERS '07 & EUROSENSORS XXI, DIGEST OF TECHNICAL PAPERS : VOLS 1 AND 2*, 2007, pp. U709-U710.

[107]

M. Sterner *et al.*, "Mechanically tri-stable SPDT metal-contact MEMS switch embedded in 3D transmission line," in *Proceedings of the 37th European Microwave Conference, EUMC*, 2007, pp. 1225-1228.

[108]

M. Stemer *et al.*, "Mechanically tri-stable SPDT metal-contact MEMS switch embedded in 3D transmission line," in *European Microwave Week 2007 Conference Proceedings, EuMW 2007 - 2nd European Microwave Integrated Circuits Conference, EuMIC 2007*, 2007, pp. 153-156.

[109]

S. Braun, J. Oberhammer and G. Stemme, "MEMS single-chip microswitch array for re-configuration of telecommunication networks," in *2006 European Microwave Conference : Vols 1-4*, 2006, pp. 315-318.

[110]

J. Oberhammer *et al.*, "Mechanically tri-stable in-line single-pole-double-throw all-metal switch," in *MEMS 2006 : 19th IEEE International Conference on Micro Electro Mechanical Systems, Technical Digest*, 2006, pp. 898-901.

[111]

J. Oberhammer and G. Stemme, "Passive contact force and active opening force electrostatic switches for soft metal contact materials," in *MEMS 2006 : 19th IEEE International Conference on Micro Electro Mechanical Systems, Technical Digest*, 2006, pp. 162-165.

[112]

M. Mowlér *et al.*, "A 2-bit reconfigurable meander slot antenna with RF-MEMS switches," in *Antennas and Propagation Society International Symposium, 2005 IEEE : volym 2A*, 2005, pp. 396-399.

[113]

J. Oberhammer, A. Q. Liu and G. Stemme, "Numerical algorithm for quasi-static nonlinear simulation of touch-mode actuators with complex geometries and pre-stressed materials," in *Transducers '05, Digest of Technical Papers, Vols 1 and 2*, 2005, pp. 2119-2122.

[114]

J. Oberhammer and G. Stemme, "Contact printing for improved bond-strength of patterned adhesive full-wafer bonded 0-level packages," in *MEMS 2004 : 17TH IEEE INTERNATIONAL CONFERENCE ON MICRO ELECTRO MECHANICAL SYSTEMS, TECHNICAL DIGEST*, 2004, pp. 713-716.

[115]
J. Oberhammer and G. Stemme, "S-shaped film actuator for low-voltage high-isolation mems metal contact switches," in *MEMS 2004: 17TH IEEE INTERNATIONAL CONFERENCE ON MICRO ELECTRO MECHANICAL SYSTEMS, TECHNICAL DIGEST,* 2004, pp. 637-640.

[116]
J. Oberhammer and G. Stemme, "Incrementally etched electrical feedthroughs for wafer-level transfer of glass lid packages," in *BOSTON TRANSDUCERS'03: DIGEST OF TECHNICAL PAPERS : VOLS 1 AND 2,* 2003, pp. 1832-1835.

[117]
J. Oberhammer, B. Lindmark and G. Stemme, "RF characterization of low-voltage high-isolation MEMS series switch based on a S-shaped film actuator," in *PROCEEDINGS OF THE INTERNATIONAL 2003 SBMO/IEEE MTT-S INTERNATIONAL MICROWAVE AND OPTOELECTRONICS CONFERENCE - IMOC 2003 : VOLS I AND II*, 2003, pp. 537-540.

[118]
J. Oberhammer, F. Niklaus and G. Stemme, "Sealing of Adhesive Bonded Devices on Wafer Level," in *Proc. Eurosensors XVI,* 2002, pp. 298-299.

[119]
J. Oberhammer, F. Niklaus and G. Stemme, "Selective Wafer Level Adhesive Bonding with Benzocyclobutene," in *Proc. Micromechanics Europe MME 2001,* 2001, pp. 54-57.

Chapters in books

[120]
R. Malmqvist *et al.*, "Reconfigurable RF Circuits and RF-MEMS," in *Microwave and Millimeter Wave Circuits and Systems : Emerging Design, Technologies, and Applications,* John Wiley & Sons, 2012, pp. 325-356.

[121]
N. Somjit, G. Stemme and J. Oberhammer, "Reconfigurable Three-Dimensional Micromachined Dielectric-Loaded CPW Phase Shifter," in *Series in Micro and Nanoengineering : New developments in micro electro mechanical systems for radio frequency and millimeter wave applications,* George Konstantinidis, Alexandru Müller, Dan Dascălu, Robert Plana Ed., 15th ed. Publishing House of the Romanian Academy, 2009, pp. 163-167.

Non-peer reviewed

Conference papers

[122]
F. Töpfer, S. Dudorov and J. Oberhammer, "Characterization of high-resolution millimeter-wave measurement probe for skin tissue analysis," in *13th International Symposium on RF-MEMS and RF-Microsystems (MEMSWAVE 2012),* 2012.

[123]
F. Töpfer *et al.*, "High-resolution microwave skin cancer diagnostic tool based on micromachined interface," in *Micronano System Workshop (MSW) 2012,* 2012.

[124]

M. Sterner *et al.*, "MEMS-tunable high-impedance surface millimeter-wave phase shifterfor dielectric-rod antenna beam forming," in *GigaHertz 2012,* 2012.

[125]

U. Shah, M. Sterner and J. Oberhammer, "RF MEMS RECONFIGURABLE FILTERS BASED ON MOVABLE SIDEWALLS OF A 3D MICROMACHINED TRANSMISSION LINE," in *GigaHertz Symposium 2012,* 2012.

[126]

U. Shah, M. Sterner and J. Oberhammer, "TUNEABLE DIRECTIONAL COUPLERS IN 3D MICROMACHINEDTRANSMISSION LINE FOR ULTRA-WIDEBAND APPLICATIONS," in *GigaHertz Symposium 2012,* 2012.

[127]

M. Sterner *et al.*, "Integration of microwave MEMS reconfigurable reflective surfaces in rectangular waveguide stubs," in *2010 Asia-Pacific Microwave Conference, APMC 2010,* 2010, pp. 1825-1828.

[128]

J. Oberhammer *et al.*, "Microwave MEMS Activities at KTH- Royal Institute of Technology," in *8th Micronano System Workshop 2010 (MSW 2010). Stockholm, Sweden. May 4-5, 2010,* 2010.

[129]

M. Sterner *et al.*, "Millimeter-Wave RF MEMS Reconfigurable High-Impedance Surfaces for Radar Applications," in *GigaHertz Symposium 2010,* 2010.

[130]

M. Sterner, G. Stemme and J. Oberhammer, "Nanometer-scale flatness and reliability investigation of stress-compensated symmetrically-metallized monocrystalline-silicon multi-layer membranes," in *5th IEEE International Conference on Nano/Micro Engineered and Molecular Systems,* 2010, pp. 959-962.

[131]

M. Sterner *et al.*, "RF MEMS Tuneable High-Impedance Metamaterial Surfaces for Millimeter-Wave Applications," in *Proc. Micro Structure Workshop 2010,* 2010.

[132]

M. Sterner *et al.*, "Reliability investigation of stress-compensated metal-coated monocrystalline-silicon membranes for MEMS tuneable high-impedance surfaces," in *11th International Symposium on RF MEMS and RF Microsystems. Otranto, Italy. June 29 - July 1 2010,* 2010.

[133]

D. Chicherin *et al.*, "MEMS tunable metamaterials for beam steering millimeter wave applications," in *NATO-Advanced Research Workshop : Advanced Materials and Technologies for Micro/Nano Devices, Sensors and Actuators,* 2009.

[134]

S. Braun, J. Oberhammer and G. Stemme, "MEMS crossbar switches for telecommunication networks," in *Micro System Workshop 08,* 2008.

[135]

D. Bhattacharyya *et al.*, "Material aspects for batch integration of PZT thin films using transfer bonding technologies : Q2M development," in *Proc. 4M 2008 Conference on Multi-Material Micro Manufacture,* 2008.

[136]

S. Braun, J. Oberhammer and G. Stemme, "Smart individual switch addressing of 5×5 and 20×20 MEMS double-switch arrays," in *TRANSDUCERS and EUROSENSORS '07 - 4th International Conference on Solid-State Sensors, Actuators and Microsystems,* 2007, pp. 153-156.

[137]

M. Mowler *et al.*, "A 2-bit Reconfigurable Meander Slot Antenna with High-Displacement Low-Voltage RF MEMS Switches," in *Proc. MEMSWave – Workshop on MEMS for Millimeterwave Communication 2004,* 2004, pp. D20-D24.

[138]

A. Thorsén *et al.*, "Summit RF MEMS packaging," in *Fifth Micro Structure Workshop (MSW 2004),* 2004.

[139]

F. Niklaus, J. Oberhammer and G. Stemme, "Adhesive Wafer Bonding for Packaging Applications," in *Workshop on MEMS Sensor Packaging 2003; Copenhagen, Denmark, 20-21 March 2003,* 2003.

Chapters in books

[140]

J. Oberhammer *et al.*, "RF MEMS for automotive radar," in *Handbook of Mems for Wireless and Mobile Applications,* Elsevier, 2013, pp. 518-549.

[141]

J. Oberhammer *et al.*, "RF MEMS for automotive radar sensors," in *Mems for Automotive and Aerospace Applications,* Elsevier, 2013, pp. 106-136.

[142]

J. Oberhammer *et al.*, "RF MEMS for Automotive and Radar Applications : MEMS for Automotive and Radar Applications," in *MEMS for Automotive and Radar Applications : RF MEMS for Automotive and Radar Applications,* Woodhead Publishing Limited, 2012.

Theses

[143]

J. Oberhammer, "Novel RF MEMS Switch and Packaging Concepts," Doctoral thesis , Stockholm : KTH 0401, 2004.

Patents

Approved patents

[144]

J. Oberhammer, "Swtich, Method and System For Switching The State of a Signal Path," us 20090314616A1 , 2007.

[145]

J. Oberhammer and G. Stemme, "Film Actuator Based Mems Device and Method," US 20070256917A1 , 2004.

[146]

F. Niklaus, G. Stemme and J. Oberhammer, "Method for sealing a microcavity and package comprising at least one microcavity," EP 1540727 (2010-10-20), 2002.

Dato: 09-05-2017

Indstilling vedr. sammensætning af sagkyndigt udvalg vedr. tildeling af titlen adjungeret lektor ved Institut for Arkitektur, Design og Medieteknologi.

Kandidat vedr. tildeling af titlen adjungeret lektor:

Dr. Sergio Escalera (lektor ved University of Barcelona)

Bilag: Indstilling og CV

Bedømmelsesudvalg:

- Professor Mads Græsbøll Christensen, Institut for Arkitektur, Design og Medieteknologi, AAU
- Lektor Matthias Rehm, Institut for Arkitektur, Design og Medieteknologi, AAU
- Professor Henrik Karstoft, Department of Eng., AU

Bilag: CV for ekstern bedømmer

AALBORG UNIVERSITY
DENMARK

To whom it may concern

Department of Architecture, Design
and Media Technology
Rendsburggade 14
9000 Aalborg
Denmark

Contact person:
Thomas Moeslund
Phone: +45 9940 8787
E-mail: tbm@create.aau.dk
Web: www.create.aau.dk/tbm

Date: 30-03-2017

Topic: Nomination of Dr. Sergio Escalera (SE) as Adjunct Associate Professor at AAU

I hereby want to nominate Dr. Sergio Escalera, University of Barcelona as Adjunct Associate Professor at AAU. SE will be associated with the Visual analysis of People Lab @ CREATE.

The motivation for nominating SE is twofold. Firstly, SE is an internationally recognized expert within the research field of Visual Analysis of People. A formal and hence stronger connection between him and our lab will ensure even more collaborations and internationally networking. Secondly, SE is an expert within machine learning and we have therefore invited him to AAU to participate in teaching activities at master and PhD level within this field. This has been very beneficial for AAU. We want to strengthen this activity via a more formal connection.

I met SE for the first time at the AMDO conference in 2012. We quickly realized that we shared a desire to apply multi-modal sensing and machine learning to computer vision problems. We therefore started a collaboration involving local students working on different aspects of multi-modal sensing. The work was published and we have since then followed up with more collaborations in different ongoing national and international projects.

SE's research merits:
In my view SE has in a very short time proved to be an excellent researcher within the fields of computer vision and machine learning. Since he received his PhD-degree in 2009 he has already published 45+ journal papers and numerous peer-reviewed conference papers including several at CVPR. He has received different awards for his work including winning one of the Pascal competitions. He already has his own research group that has been able to attract external funding as well as good students (this is actually not so easy in the current financial situation in Spain).

To me SE doesn't seem to be driven by a particular application area or methodology, but rather by a curiosity of how state-of-the-art machine learning methods can be applied to real-world problems. This has resulted in research in different areas like "looking-at-people", informatics, medical imaging and computer graphics.

I find his main research contributions to be his work on multi-class and multi-model detection and recognition. These works have allowed for bringing the research fields closer to one of the "holy grails", namely an automatic semantic interpretation of real-life scenes. I'm not the only one finding SE's work impressive. In 2013 he was nominated for the prestigious PAMI Young Researcher Award. When studying his different papers, it is clear that SE has the quality of being both thorough as well as broad in his choice research topics. I find this quite appealing for a researcher. I also find it rather impressive that he already has established his own research group at University of Barcelona. There is no question of his devoting to academia.

Recently SE has been engaged in research organization, which is sometimes an overlooked activity when judging researchers. Without skilled researchers to organize research events, academia would suffer. SE has been one of the front figures in the successful ChaLearn Challenges. The culmination of this effort, so far, is that SE is currently an invited guest-editor for a special issue in the absolute most prestigious journal within computer vision, namely PAMI. That is quite an achievement!

Altogether, I highly recommend SE for an Adjunct Associate Professorship at AAU. Please do not hesitate to contact me for additional information.

Regards,
Professor Thomas Moeslund
Head of Media Technology, Aalborg
Head of the Visual Analysis of People Lab
Aalborg University, CREATE, Denmark

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PERSONAL INFORMATION

Full name: Sergio ESCALERA GUERRERO

Nationality: Spain

Email: sergio.escalera.guerrero@gmail.com

Date of birth: 12 Sept 1980

URL: www.sergioescalera.com

EDUCATION

2008   PhD Computer Science, Computer Science Dept, Computer Vision Center, UAB, Spain, **Best Thesis Award**

2004   Master on Computer Vision, Computer Vision Center, Universitat Autonoma de Barcelona, Spain

2003   Computer Engineering, Universitat Autonoma de Barcelona, Spain

ACADEMIC POSITIONS
NATIONAL
- 2014-up to date- University of Barcelona, Interim Associate Professor.
- 2003-2008 - Associate lecturer (UAB, UOC).
- 2003-up to date- Researcher at the Computer Vision Centre of the UAB.
INTERNATIONAL
- 2015-up to date- Contracted visiting professor, Aalborg University, Denmark. **Thomas Moeslund research group** (1/1/2015 - 30/06/2015 full time - 01/07/2015 - up to date partial time).
- 2015-up to date- Adjunct professor at Dalhousie University, Canada (at distance).
- 2013-up to date- Vice-president of ChaLearn challenges in Machine Learning, Berkeley (at distance).
- 2007 - Delft University, 3 months research stay.

PROJECT AND RESEARCH AWARDS (selection)
- 3 papers nominated to Best Paper Award at Faces and Gestures 2017 (FG) conference, Washington, 2017, - pending decision
- Best paper award in three international conferences (CANADIAN IA, IBPRIA, AMDO)
- 3rd Prize of Microsoft-ChaLearn for Kinect demonstration applications, in conjunction with ICPR 2012, Japan
- Best 2010 Spanish solidary project nomination by Cruz Roja – Grupo Zeta – ONCE for an automatic sign language recognition system
- 1st Winner of the PASCAL international network of excellente from FP7, VOC Human Layout World Challenge in conjunction with ECCV 2010
- Best 2008 informatics PhD Thesis award UAB.

PROFESSIONAL INVOLVEMENT (selection) (http://sergioescalera.com/organizer/)
EDITOR

2016-	**Series Editor: Springer Series on Challenges in Machine Learning** (*Link to the New Series*)
2017	Book editor: Human-Robot Interaction – Theory and Application, INTECH, ISBN, 978-953-51-5611-6
2015-	Editor in Chief of American Journal of Intelligent Systems (AJIS)
2017	Guest Editor EURASIP Journal on Image and Video Processing, Special Issue on Applications of Visual Analysis of Human Behaviour
2017	Book Editor: Gesture Recognition System, Springer, In press.
2016-2017	**IEEE Transactions on Pattern Analysis and Machine Intelligence**, Special Issue main guest editor: The Computational Face
2016-2017	**IEEE Transactions on Affective Computing**, Special Issue main guest editor: Artificial Personality Analysis
2016-2017	**Pattern Recognition**, Special Issue guest editor: Articulated Motion and Deformable Objects
2014-2016	**IEEE Transactions on Pattern Analysis and Machine Intelligence**, Special Issue main guest editor: Multi-modal Human Pose Recovery and Behavior Analysis
2015-2017	**International Journal of Computer Vision**, Special Issue main guest editor: Looking at People
2015-2016	**Neural computing and applications**, Special Issue guest editor:: Assistive Technology in Computer Vision and Robotics
2012-2014	**Journal of Machine Learning Research**, Special topic main guest editor: Gesture Recognition

ORGANIZATION (http://sergioescalera.com/organizer/)
- **Area chair: <u>NIPS 2016 (gesture recognition)</u>,** WACV 2016 (theory), AVSS 2017 (human behavior), <u>**FG 2017 (gesture recognition), International Conference on Computer Vision ICCV 2017.**</u>
- **Challenge and demo chair**: <u>**FG 2017, NIPS 2017.**</u>
- **Co-organizer**: CCIA04, CCIA14, ICCV11, AMDO2016, FG2017
- **Workshop and challenge organizer**: ICCV11, ICMI13, ECCV14, CVPR15, ICCV15, CVPR16, ECCV16, ICPR16, NIPS16, IJCNN17, CVPR17, ICCV17.

POSITIONS IN RELEVANT NATIONAL AND INTERNATIONAL ORGANIZATIONS (selection)
- 2015-up to date- Vice-chair (and **current Chair since 1/1/2017**) of International Association in Pattern Recognition **IAPR TC-12: Visual and multimedia systems**.
- 2013-up to date- **Vice-president of ChaLearn** Challenges in Machine Learning, Berkeley.
- 2009-up to date- Head of Human Pose Recovery and Behavior Analysis Group (HuPBA), with associated consolidated SGR 2014 561 (VCL) and TECNIO 2016 TECDTP15-1-0023 (Data science) groups.
- Others: member of IEEE, BGSMath, INNS, AERFAI, ACIA

DISSEMINATION, PATENTS, AND INVITED TALKS (http://sergioescalera.com/dissemination/)
- **Patents:**
- **Inventor/s (signature):** Sergio Escalera, Miguel Reyes, José Ramírez, Juan Ramón Jiménez, y Petia Radeva, **Title:** ADiBAS Posture: Automatic Digital Biometry Analysis System, **Application number:** B3342-11 **First priority country:** SPAIN **Date of priority:** 2011, **Main institution:** Universitat de Barcelona
- **Inventor/s (signature):** Getino González, J.M.; Cuetos Revuelta, M.J.; Sanz Gómez, M.; Fernández Cacho, J.A.; Pujol Vila, O.; Escalera Guerrero, S., **Title:** Método y sistema de visión artificial para el control de calidad de servicios públicos municipales, **Application number:** P2010315588 **First priority country:** SPAIN **Date of priority:** 2011, **Main institution:** Empresa, **Institutions exploiting it:** Facultat de Matemàtiques de la Universitat de Barcelona, **Model:** Request priority
- **Inventor/s (signature):** Moya, J.; Catalan, M.; Fornells, E.; Escalera, S., **Title:** Software para la transmisión de información y documentación de casos complejos en salud, **Application number:** Tauli VA01 **First priority country:** Spain **Date of priority:** 12/09/2013, **Model:** Intellectual Property
- **Inventor/s (signature):** Jordi González Sabaté; Xavier Baró Solé; Martha Mackay; Sergio Escalera Guerrero, **Title:** A computer-implemented method and a system for remotely monitoring a user, and a computer program product implementing the method, **Application number:** T-2014-008 **First priority country:** Spain **Date of priority:** 30/07/2014, **Model:** Request priority
- **Inventor/s (signature):** Germán León; Sergio Escalera; Jordi Gonzàlez; Jordi Abella; Agnés Borrás; Coen Antenes, **Title:** Procedimiento para identificar el gesto de una mano, **Application number:** EP14382303.7 **First priority country:** Spain **Date of priority:** 01/08/2014, **Model:** Request priority
- **Inventor/s (signature):** Xavier Baró Solé; Sergio Escalera Guerrero; Martha Mackay Jarque; Jordi González Sabaté, **Title:** A computer-implemented method and a system for remotely monitoring a user, and a computer program product implementing the method, **Application number:** EP 14382294.8 **First priority country:** European Patent Convention Countries **Date of priority:** 30/07/2014, **Main institution:** Universitat Autònoma de Barcelona (UAB) / Centre de Visió per Computador CVC / Universitat de Barcelona / Universitat Oberta de Catalunya (UOC) / ACCEPLAN ACCESIBILIDAD SL
- **>5 Invited talks in international conferences** (http://sergioescalera.com/dissemination/)

TEACHING AND SUPERVISION ACTIVITIES
        SUPERVISION   OF   GRADUATE   STUDENTS   AND   POSTDOCTORAL   FELLOWS (http://sergioescalera.com/students/) (http://sergioescalera.com/teaching/)
- **8 supervised PhD** Thesis (6 in progress), **>20 supervised Master Thesis**, >50 supervised BsC Thesis, **2 group postdocs** (from H2020 and **Co-fund Marie Curie action**). Defended PhDs list:
  1. **Eloi Puertas** PhD Thesis: Generalized Stacked Sequential Learning. Slides., Universitat de Barcelona, 2014
  2. **Xavier Perez-Sala** PhD Thesis: Extending Procrustes Analysis: Building Multi-view 2-D Models from 3-D Human Shape Samples, Universitat Politecnica de Catalunya, 2015.
  3. **Antonio Hernández-Vela** PhD Thesis: From pixels to gestures: learning visual representations for human analysis in color and depth data sequences, Universitat de Barcelona, 2015. Presentation. Co-supervised with Full Prof. Stan Sclaroff, Boston University, USA
  4. **Miguel Ángel Bautista** PhD Thesis: Learning Error-Correcting Representations for Multi-Class Problems, Universitat de Barcelona, 2015. PhD Presentation slides. Personal webpage
  5. **Mohammad Ali Bagheri** PhD Thesis: Ensemble Learning for Visual Recognition, Dalhousie University, 2016, Slides Co-supervised with Full Prof. Qigang Gao, dalhousie university, USA
  6. **Miguel Reyes** PhD Thesis. Human Pose Analysis and Gesture Recognition from Depth Maps: Methods and Applications, 2017. Slides.
  7. **Víctor Ponce-López** PhD Thesis: Evolutionary Bags of Space-time Features for Human Analysis. 2016. Slides.
  8. **Frederic Sampedro** PhD Thesis: Automatic image quantification strategies in clinical nuclear medicine and neuroradiology. Presentation slides.

TEACHING AT NATIONAL AND INTERNATIONAL LEVEL (selection) (http://sergioescalera.com/teaching/)

- **More than 3000 hours teaching in different Catalan Universities (UAB, UOC, UB, URV, UPC) and Aalborg University, undergraduate and master subjects**, including: Artificial Intelligence, Software Engineering, Computer Vision, System Administration, Programming Elements, Operating Systems, Algorithms and Advanced Algorithms, Perceptual Computing, Java programming, Object oriented programming, Human and Object Recognition, Object Recognition, and Data Science.
- **2015** European Training School on Integrating Vision and Language: Computer Vision Datasets and Annotations, from Cost Action on the integration of vision and language consortia, Zurich.

PUBLICATIONS **(213 scientific publications, 64 impact factor journals, 41 Q1 journals, number of published impact factor journals in 2016: 16, selection, Google Scholar citations 2187, h-index 24, i10-index 60)** (http://sergioescalera.com/publications/)

JOURNALS SELECTION:

1. Mohammad Ali Bagheri, Qigang Gao, Sergio Escalera, Huamin Ren, Thomas B. Moeslund, Elham Etemad, Locality Regularized Group Sparse Coding for Action Recognition, Computer Vision and Image Understanding, CVIU, 2017. **(Q1, IF: 2,134)**
2. Miguel Bautista, Oriol Pujol, Sergio Escalera, Error Correcting Output Codes Factorization, **IEEE Transactions on Pattern Analysis and Machine Intelligence**, TPAMI, 2017. **(Q1, IF: 6,077)**
3. Xavier Perez-Sala, Fernando De la Torre, Laura Igual, Sergio Escalera, and Cecilio Angulo, Subspace Procrustes Analysis, **International Journal of Computer Vision**, IJCV, 2016. **(Q1, IF: 4,270)**
4. Sergio Escalera, Vassilis Athitsos, Isabelle Guyon, Challenges in multimodal gesture recognition, **Journal of Machine Learning Research**, vol. 17, pp. 1-54, 2016. **(Q1, IF: 2,473)**
5. Cristina Palmero, Jordi Esquirol, Vanessa Bayo, Miquel Àngel Cos, Pouya Ahmadmonfared, Joan Salabert, David Sánchez, and Sergio Escalera, Automatic Sleep System Recommendation by Multi-modal RBG-Depth-Pressure Anthropometric Analysis, **International Journal of Computer Vision**, 2016. **(Q1, IF: 4,270)**
6. Sergio Escalera, Jordi Gonzalez, Xavier Baro, Jamie Shotton, Guest Editors' Introduction to the Special Issue on Multimodal Human Pose Recovery and Behavior Analysis, **IEEE Transactions on Pattern Analysis and Machine Intelligence**, IEEE TPAMI, Vol. 28, 2016. **(Q1, IF: 6,077)**
7. Cristina Palmero, Ibert Clapés, Chris Bahnsen, Andreas Møgelmose, Thomas B. Moeslund, Sergio Escalera, Multi-modal RGB-Depth-Thermal Human Body Segmentation, **International Journal of Computer Vision**, IJCV, 2016. **(Q1, IF: 4,270)**
8. Gerard Canal, Sergio Escalera, Cecilio Angulo, A Real-time Human-Robot Interaction system based on gestures for assistive scenarios, **Computer Vision and Image Understanding**, CVIU, 2016. **(Q1, IF: 2,134)**
9. Ciprian A. Corneanu, Marc Oliu, Jeffrey F. Cohn, and Sergio Escalera, Survey on RGB, 3D, Thermal, and Multimodal Approaches for Facial Expression Recognition: History, Trends, and Affect-related Applications, **IEEE Transactions on Pattern Analysis and Machine Intelligence**, 2016. **(Q1, IF: 6,077)**
10. Antonio Hernandez-Vela, Sergio Escalera, Stan Sclaroff, Poselet-basedContextual Rescoring for Human Pose Estimation via Pictorial Structures, **International Journal of Computer Vision**, pp. 49-64, 2016. **(Q1, IF: 4,270)**
11. Miguel Angel Bautista, Antonio Hernandez-Vela, Sergio Escalera, Laura Igual, Oriol Pujol, Josep Moya, Veronica Violant, and Maria Teresa Anguera, A Gesture Recognition System for Detecting Behavioral Patterns of ADHD, **System Man and Cybernetics, Part B**, 2015. **(Q1, IF: 6,220)**
12. Oscar Lopes, Miguel Reyes, Sergio Escalera, and Jordi Gonzàlez, Spherical Blurred Shape Model for 3-D Object and Pose Recognition: Quantitative Analysis and HCI Applications in Smart Environments, **IEEE Transactions on System Man and Cybernetics, Part B Cybernetics**, 2014. **(Q1, IF: 4,150)**
13. Laura Igual, Xavier Perez-Sala, Sergio Escalera, Cecilio Angulo, and Fernando De la Torre, Continuous Generalized Procrustes Analysis, **Pattern Recognition**, 2013. **(Q1, IF: 3,399)**
14. Miguel Ángel Bautista, Sergio Escalera, Oriol Pujol, On the Design of an ECOC-Compliant Genetic Algorithm, **Pattern Recognition**, 2013. **(Q1, IF: 3,399)**
15. Sergio Escalera, Alicia Fornés, Oriol Pujol, Josep Lladós, and Petia Radeva, Circular Blurred Shape Model for Multiclass Symbol Recognition, **Systems, Man, and Cybernetics, Part B: Cybernetics**, IEEE Transactions On, Volume 41, Issue 2, pp. 497-506, pp. 1-10, IEEE Society, 2011. **(Q1, IF: 3,21)**
16. Sergio Escalera, Oriol Pujol, and Petia Radeva, Error-Correcting Output Codes Library, **Journal of Machine Learning Research**, vol. 11, pp. 661-664, MIT Press, USA, ISSN 1532-4435, 2010. **(Q1, IF: 2,949)**
17. Sergio Escalera, Oriol Pujol, and Petia Radeva, On the Decoding Process in Ternary Error-Correcting Output Codes, **IEEE Transactions on Pattern Analysis and Machine Intelligence**, vol. 32, issue 1, pp. 120-134, IEEE Computer Society, New York, ISSN 0162-8828, 2010. **(Q1, IF: 6,077)**
18. Oriol Pujol, Sergio Escalera, and Petia Radeva, An Incremental Node Embedding Technique for Error Correcting Output Codes, vol. 14, issue 2, pp. 713-725, **Pattern Recognition**, Elsevier, Heidelberg, ISSN 0031-3203, 2008. **(Q1, IF: 2,450)**
19. Sergio Escalera, David Tax, Oriol Pujol, Petia Radeva, and Robert Duin, Subclass Problem-dependent Design of Error-Correcting Output Codes, vol. 30, issue 6, pp. 1041-1054, **IEEE Transactions on Pattern Analysis and Machine Intelligence**, IEEE Computer Society, Los Alamitos, ISSN 0162-8828, 2008. **(Q1, IF: 6,077)**

CONFERENCES AND BOOK CHAPTERS (http://sergioescalera.com/publications/)

1. Marc Oliu, Ciprian Corneanu, Lazslo A. Jeni, Jeffrey F. Cohn, Takeo Kanade, and Sergio Escalera, Continuous Supervised Descent Method for Facial Landmark Localisation, **ACCV 2016. Oral.**

2. Víctor Ponce-López, Hugo Jair Escalante, Sergio Escalera, Xavier Baró, Gesture and Action Recognition by Evolved Dynamic Subgestures, British Machine Vision Conference, **BMVC**, 2015.
3. Huamin Ren, Weifeng Liu, Søren Ingvor Olsen, Sergio Escalera, Thomas B. Moeslund, Unsupervised Behavior-Specific Dictionary Learning for Abnormal Event Detection, British Machine Vision Conference, **BMVC**, 2015.
4. Antonio Hernández-Vela, Stan Sclaroff, and Sergio Escalera, Contextual rescoring for Human Pose Estimation, **BMVC**, 2014.
5. Antonio Hernández-Vela, Nadezhda Zlateva, Alexander Marinov, Miguel Reyes, Petia Radeva, Dimo Dimov, and Sergio Escalera, Graph Cuts Optimization for Multi-Limb Human Segmentation in Depth Maps, IEEE Computer Vision and Pattern Recognition conference, **CVPR**, 2012.

PUBLICATIONS LAST 5 YEARS 2012-1017

Publications 2017
- Miguel Angel Bautista, Oriol Pujol, Fernando De la Torre, and Sergio Escalera, Error-Correcting Factorization, IEEE Transactions on Pattern Analysis and Machine Intelligence, TPAMI, 2017.
- Mohammad Ali Bagheri, Qigang Gao, Sergio Escalera, Huamin Ren, Thomas B. Moeslund, Elham Etemad, Locality Regularized Group Sparse Coding for Action Recognition, Computer Vision and Image Understanding, CVIU, 2017.
- Sergio Escalera, Xavier Baró, Hugo Jair Escalante, and Isabelle Guyon, ChaLearn Looking at People: Events and Resources, arXiv:1701.02664, 2017.

Publications 2016
- Xavier Baró, Sergio Escalera, Isabelle Guyon, Julio C. S. Jacques Junior, Lukasz Romazco, Lisheng Sun, Sébastien Treguer, Evelyne Viegas, Coopetitions in machine learning: case studies, Challenges in Machine Learning: Gaming and Education, NIPS workshop, 2016.
- Marc Oliu, Ciprian Corneanu, Laszlo A. Jeni, Jeff rey F. Cohn, Takeo Kanade, and Sergio Escalera, Continuous Supervised Descent Method for Facial Landmark Localisation, ACCV 2016. Slides. Poster. Oral. Code and data webpage.
- Hugo Jair Escalante, Víctor Ponce López, Jun Wan, Michael Riegler, Baiyu Chen, Albert Clapés, Sergio Escalera, Isabelle Guyon, Xavier Baro, Pal Halvorsen, Henning Müller, and Martha Larson, ChaLearn Joint Contest on Multimedia Challenges Beyond Visual Analysis: An overview, ICPRW, 2016.
- Iiris Lūsi, Sergio Escarela, and Gholamreza Anbarjafari, Human Head Pose Estimation on SASE database using Random Hough Regression Forests, ICPRW, 2016.
- Fatemeh Noroozi, Marina Marjanovic, Angelina Njegus, Sergio Escalera, and Gholamreza Anbarjafari, Fusion of Classifier Predictions for Audio-Visual Emotion Recognition, ICPRW, 2016.
- Víctor Ponce-López, Baiyu Chen, Marc Oliu, Ciprian Corneanu, Albert Clapés, Isabelle Guyon, Xavier Baró, Hugo Jair Escalante, Sergio Escalera, ChaLearn LAP 2016: First Round Challenge on First Impressions – Dataset and Results, ChaLearn Apparent Personality Analysis workshop, ECCV, 2016. Slides.
- Baiyu Chen, Sergio Escalera, Isabelle Guyon, Victor Ponce-Lopez, Nihar Shah, and Marc Oliu Simon, Overcoming Calibration Problems in Pattern Labeling with Pairwise Ratings, ChaLearn Apparent Personality Analysis workshop, ECCV, 2016.
- Iiris Lusi, Sergio Escarela, and and Gholamreza Anbarjafari, SASE: RGB-Depth Database for Human Head Pose Estimation, ChaLearn Apparent Personality Analysis workshop, ECCV, 2016. Slides.
- Xavier Perez-Sala, Fernando De la Torre, Laura Igual, Sergio Escalera, and Cecilio Angulo, Subspace Procrustes Analysis, International Journal of Computer Vision, IJCV, 2016.
- Frederic Sampedro, Anna Domenech, Sergio Escalera, Ignasi Carrio, Computing quantitative indicators of structural renal damage in pediatric DMSA scans / Cómputo de indicadores cuantitativos de daño renal estructural en imágenes DMSA pediátricas, Revista Española de Medicina Nuclear e Imagen Molecular, 2016.
- Mikkel Thøgersen, Sergio Escalera, Jordi Gonzàlez, and Thomas B Moeslund, Segmentation of RGB-D Indoor scenes by Stacking Random Forests and Conditional Random Fields, Pattern Recognition Letters, vol. 80, pp. 208–215, 2016.
- Avots, E., Daneshmand, M., Traumann, A., Escalera, S., & Anbarjafari, G., Automatic garment retexturing based on infrared information. Computers & Graphics, vol. 59, pp. 28-38, 2016
- Isabelle Guyon, Imad Chaabane, Hugo Jair Escalante, Sergio Escalera, Damir Jajetic, James Robert Lloyd, Nuria Macia, Bisakha Ray, Lukasz Romaszko, Michele Sebag, Alexander Statnikov, Sebastien Treguer, Evelyne Viegas, A brief Review of the ChaLearn AutoML Challenge: Any-time Any-dataset Learning without Human Intervention, AutoML workshop, ICML, JMLR proceedings, 2016.
- Sergio Escalera, Vassilis Athitsos, Isabelle Guyon, Challenges in multimodal gesture recognition, Journal of Machine Learning Research, vol. 17, pp. 1-54, 2016.
- Cristina Palmero, Jordi Esquirol, Vanessa Bayo, Miquel Àngel Cos, Pouya Ahmadmonfared, Joan Salabert, David Sánchez, and Sergio Escalera, Automatic Sleep System Recommendation by Multi-modal RBG-Depth-Pressure Anthropometric Analysis, International Journal of Computer Vision, 2016.

- Jose Garcia-Rodriguez, Isabelle Guyon, Sergio Escalera, Alexandra Psarrou, Andrew Lewis, Miguel Cazorla, Editorial: Special Issue on Computational Intelligence for Vision and Robotics, Neural Computing and Applications, DOI: http://dx.doi.org/doi:10.1007/s00521-016-2330-8, 2016.
- Mohammad Ali Bagheri, Qigang Gao, and Sergio Escalera, Action Recognition by Pairwise Proximity Function Support Vector Machines with Dynamic Time Warping Kernels, Canadian Conference on AI, pp. 3-14, 2016.
- Pejman Rasti, Tonis Uiboupin, Sergio Escalera and Gholamreza Anbarjafari, Convolutional Neural Network Super Resolution for Face Recognition in Surveillance Monitoring, Articulated Motion and Deformable Objects, AMDO, 2016
- Dennis H. Lundtoft, Kamal Nasrollahi, Thomas B. Moeslund and Sergio Escalera, Spatiotemporal Facial Super-Pixels for Pain Detection, Articulated Motion and Deformable Objects, AMDO, 2016. Best student paper award
- Mark Philip Philipsen, Anders Jørgensen, Thomas Moeslund and Sergio Escalera, RGB-D Segmentation of Poultry Entrails, Articulated Motion and Deformable Objects, AMDO, 2016. Best commercial paper award
- Jun Wan, Yibing Zhao, Shuai Zhou, Isabelle Guyon, Sergio Escalera, ChaLearn Looking at People RGB-D Isolated and Continuous Datasets for Gesture Recognition, CVPRW, CVPR, 2016.
- Sergio Escalera, Mercedes Torres-Torres, Brais Martinez, Xavier Baró, Hugo Jair Escalante, Isabelle Guyon, Georgios Tzimiropoulos, Ciprian Corneou, Marc Oliu Simón, Mohammad Ali Bagheri, Michel Valstar, ChaLearn Looking at People and Faces of the World: Face AnalysisWorkshop and Challenge 2016, CVPRW, CVPR, 2016. Slides
- Pejman Rasti, Salma Samiei, Mary Agoyi, Sergio Escalera, Gholamreza Anbarjafaria, Robust Non-blind Colour Video Watermarking Using QR Decomposition and Entropy Analysis, Journal of Visual Communication and Image Representation, 2016.
- Sergio Escalera, Jordi Gonzalez, Xavier Baro, Jamie Shotton, Guest Editors' Introduction to the Special Issue on Multimodal Human Pose Recovery and Behavior Analysis, IEEE TPAMI, Vol. 28, 2016.
- Sergio Escalera, Jordi Gonzalez, Xavier Baro, Fernando Alonso, Martha Mackay, Care Respite: a remote monitoring eHealth system for improving ambient assisted living, Human Motion Analysis for Healthcare Applications, IET London: Savoy Place, 2016.
- J. Ramirez Moreno, J. Revilla, M. Reyes, and S. Escalera, Validación del Software ADIBAS asociado al sensor Kinect de Microsoft para la evaluación de la posición corporal, IV Congreso WCPT-SAR, Argentina, 2016.
- Marc Oliu Ciprian Corneanu, Kamal Nasrollahi, Olegs Nikisins, Sergio Escalera, Yunlian Sun, Haiqing Li, Zhenan Sun, Thomas B. Moeslund, and Modris Greitans, Improved RGB-D-T based Face Recognition, IET Biometrics, 2016.
- Cristina Palmero, Albert Clapés, Chris Bahnsen, Andreas Møgelmose, Thomas B. Moeslund, Sergio Escalera, Multi-modal RGB-Depth-Thermal Human Body Segmentation, International Journal of Computer Vision, IJCV, 2016. Dataset of the project
- Gerard Canal, Sergio Escalera, Cecilio Angulo, A Real-time Human-Robot Interaction system based on gestures for assistive scenarios, Computer Vision and Image Understanding, CVIU, 2016.
- Florin Popescu, Stephane Ayache, Sergio Escalera, Xavier Baró Solé, Cecile Capponi, Patrick Panciatici, and Isabelle Guyon, From geospatial observations of ocean currents to causal predictors of spatio-economic activity using computer vision and machine learning, European Geosciences Union General Assembly, 2016.
- Hugo Jair Escalante, Víctor Ponce-López, Sergio Escalera, Xavier Baró, Alicia Morales-Reyes, José Martínez-Carranza, Evolving weighting schemes for the Bag of Visual Words, Neural Computing and Applications, 2016.
- Fernando Alonso, Xavier Baró, Sergio Escalera, Jordi Gonzàlez, Martha Mackay, Anna Serrahima, CARE RESPITE: TAKING CARE OF THE CAREGIVERS, Theme 5 The Strategic use of Mobile and Digital Health and Care Solutions, 16th International Conference for Integrated Care 2016. Poster.
- Mohammad Ali Bagheri, Qigang Gao, Sergio Escalera, Support Vector Machines with Time Series Distance Kernels for Action Classification, WACV, 2016. Code
- Ciprian A. Corneanu, Marc Oliu, Jeffrey F. Cohn, and Sergio Escalera, Survey on RGB, 3D, Thermal, and Multimodal Approaches for Facial Expression Recognition: History, Trends, and Affect-related Applications, IEEE Transactions on Pattern Analysis and Machine Intelligence, 2016.
- Antonio Hernandez-Vela, Sergio Escalera, Stan Sclaroff, Poselet-basedContextual Rescoring for Human Pose Estimation via Pictorial Structures, International Journal of Computer Vision, pp. 49-64, 2016. Web of the project: http://www.cvc.uab.es/~ahernandez/contextual.html

Publications 2015

- Víctor Ponce-López, Sergio Escalera, Marc Perez, Oriol Janes, Xavier Baro, Non-Verbal Communication Analysis in Victim-Offender Mediations, Pattern Recognition Letters, 2015.
- Andres Traumann, Gholamreza Anbarjafari, Sergio Escalera, Accurate 3D Measurement Using Optical Depth Information Electronic Letters 2015
- Mohammad Ali Bagheri, Qigang Gao, and Sergio Escalera, Combining Local and Global Learners in the Pairwise Multiclass Classification, Pattern Analysis and Applications, vol. 4, pp. 845-869, 2015.
- Martha Macckay, Fernando Alonso, Pere Salamero, Xavier Baro, Jordi Gonzalez, Sergio Escalera, Care and caring: future proofing the new demographics, 6th International Carers Conference, 2015.

- Isabelle Guyon, Kristin Bennett, Gavin Cawley, Hugo Jair Escalante, Sergio Escalera, Tin Kam Ho, Nuria Macia, Bisakha Ray, Mehreen Saeed, Alexander Statnikov, Evelyne Viegas, AutoML challenge 2015, BayLearn, 2015.
- Sergio Escalera, Junior Fabian, Pablo Pardo, Xavier Baro, Jordi Gonzalez, Hugo Escalante, Dusan Misevic, Ulrich Steiner, Isabelle Guyon, ChaLearn Looking at People 2015: Apparent Age and Cultural Event Recognition datasets and results, ChaLearn Looking at People workshop, ICCV, 2015. Slides.
- K. Nasrollahi, S. Escalera, P Rasti, G. Anbarjafari, X.Baro, H.J. Escalante, and T.B. Moeslund, Deep Learning based Super-Resolution for Improved Action Recognition, IPTA, 2015.
- Sergio Escalera, Jordi Gonzàlez, Xavier Baró, Pablo Pardo, Junior Fabian, Marc Oliu, Hugo J. Escalante, Ivan Huerta, Isabelle Guyon, ChaLearn Looking at People 2015 new competitions: Age Estimation and Cultural Event Recognition, International Joint Conference on Neural Networks, IJCNN 2015. Slides.
- Hugo Jair Escalante, Victor Ponce, Xavier Baro, Sergio Escalera, Improving Bag of Visual Words Representations with Genetic Programming, International Joint Conference on Neural Networks, IJCNN 2015.
- Isabelle Guyon, Kristin Bennett, Gavin Cawley, Hugo Jair Escalante, Sergio Escalera, Tin Kam Ho, Nuria Macia, Bisakha Ray, Mehreen Saeed, Alexander Statnikov, Evelyne Viegas, The AutoML challenge on codalab, International Joint Conference on Neural Networks, IJCNN 2015. Slides.
- Gerard Canal, Cecilio Angulo, Sergio Escalera, Gesture based Human Multi-Robot interaction, International Joint Conference on Neural Networks, IJCNN 2015. Slides. Video demo.
- Xavier Baro, Jordi Gonzalez, Junior Fabian, Miguel A. Bautista, Marc Oliu, Hugo J. Escalante, Isabelle Guyon, Sergio Escalera, ChaLearn Looking at People 2015 challenges: action spotting and cultural event recognition, CVPR workshops, 2015. Slides.
- Andres Traumann, Sergio Escalera, Gholamreza Anbarjafari, A New Retexturing Method for Virtual Fitting Room Using Kinect 2 Camera, CVPR Workshops, 2015. Slides.
- Ramin Irani, Kamal Nasrollahi, C. Bahnsen, D.H. Lundtoft, T.B. Moeslund, Marc O. Simon, Ciprian. Corneanu, Sergio Escalera, Tanja L. Pedersen, Maria-Louise Klitgaard, and Laura Petrini, Spatio-temporal Analysis of RGB-D-T Facial Images for Multimodal Pain Level Recognition, CVPR workshops, 2015. Slides.
- Mohammad Ali Bagheri, Qigang Gao, Sergio Escalera, Albert Clapes, Kamal Nasrollahi, Michael B. Holte, Thomas B. Moeslund, Keep it Accurate and Diverse: Enhancing Action Recognition Performance by Ensemble Learning, CVPR workshops, 2015.
- Isabelle Guyon, Kristin Bennett, Gavin Cawley, Hugo Jair Escalante, Sergio Escalera, Tin Kam Ho, Nuria Macia, Bisakha Ray, Mehreen Saeed, Alexander Statnikov, Evelyne Viegas, AutoML Challenge 2015: Design and First Results, ICML workshop, JMLR proceedings, 2015.
- Víctor Ponce-López, Hugo Jair Escalante, Sergio Escalera, Xavier Baró, Gesture and Action Recognition by Evolved Dynamic Subgestures, British Machine Vision Conference, BMVC 2015. Poster. Abstract.
- Huamin Ren, Weifeng Liu, Søren Ingvor Olsen, Sergio Escalera, Thomas B. Moeslund, Unsupervised Behavior-Specific Dictionary Learning for Abnormal Event Detection, British Machine Vision Conference, BMVC 2015. Abstract.
- Frederic Sampedro, Sergio Escalera, Anna Domenech and Ignasi Carrio, Automatic Tumor Volume Segmentation in Whole-Body PET/CT Scans: A Supervised Learning Approach, Journal of Medical Imaging and Health Informatics, Volume 5, Number 2, April 2015, pp. 192-201(10).
- Miguel Angel Bautista, Antonio Hernandez-Vela, Sergio Escalera, Laura Igual, Oriol Pujol, Josep Moya, Veronica Violant, and Maria Teresa Anguera, A Gesture Recognition System for Detecting Behavioral Patterns of ADHD, System Man and Cybernetics, Part B, 2015.
- Meysam Madadi, Sergio Escalera, Jordi Gonzàlez, F. Xavier Roca, Felipe Lumbreras, Multi-part body segmentation based on depth maps for soft biometry analysis, Pattern Recognition Letters 56 (2015), pp. 14–21.
- Frederic Sampedro, Sergio Escalera, Anna Domenech, Ignasi Carrio, A computational framework for cancer response assessment based on oncological PET-CT scans, Computers in Biology and Medicine, 2015.
- Frederic Sampedro, Anna Domenech, Sergio Escalera, and Ignasi Carrió, Deriving global quantitative tumor response parameters from 18F-FDG PET-CT scans in patients with non-Hodgkin's lymphoma, Nuclear Medicine Communications, 2015.
- Firat Ismailoglu, Ida G. Sprinkhuizen-Kuyper, Evgueni Smirnov, Sergio Escalera and Ralf Peeters, Fractional Programming Weighted Decoding for Error-Correcting Output Codes, IAPR Workshop on Multiple Classifier Systems, 2015.

Publications 2014

- Frederic Sampedro, Anna Domenech, and Sergio Escalera, Static and dynamic computational cancer spread quantification in whole body FDG-PET/CT scans, Journal of Medical Imaging and Health Informatics, 2014.
- Alvaro Cepero, Albert Clapés, Sergio Escalera, Automatic non-verbal communication skills analysis: a quantitative evaluation, AI Communications, 2014.
- Frederic Sampedro, Sergio Escalera, Anna Puig, Iterative Multiclass Multiscale Stacked Sequential Learning: definition and application to medical volume segmentation, Pattern Recognition Letters, 2014.
- Frederic Sampedro, Sergio Escalera, Spatial codification of label predictions in Multi-scale Stacked Sequential Learning: A case study on multi-class medical volume segmentation, IET Computer Vision, 2014.
- Daniel Sánchez, Miguel Ángel Bautista, and Sergio Escalera, HuPBA 8k+: Dataset and ECOC-GraphCut based Segmentation of Human Limbs, Neurocomputing, 2014.

- Oscar Lopes, Miguel Reyes, Sergio Escalera, and Jordi Gonzàlez, Spherical Blurred Shape Model for 3-D Object and Pose Recognition: Quantitative Analysis and HCI Applications in Smart Environments, IEEE Transactions on System Man and Cybernetics, Part B Cybernetics, 2014.
- Xavier Pérez-Sala, Sergio Escalera, Cecilio Angulo, and Jordi Gonzàlez, A survey on model based approaches for 2D and 3D visual human pose recovery, Sensors, vol. 14, pp. 4189-4210, doi:10.3390/s140304189, 2014.
- Antonio Hernández-Vela, Stan Sclaroff, and Sergio Escalera, Contextual rescoring for Human Pose Estimation, BMVC, 2014. Supplemental material. Abstract. Poster. Web of the project: http://www.cvc.uab.es/~ahernandez/contextual.html
- Eloi Puertas, M. A. Bautista, Daniel Sanchez, Sergio Escalera, Oriol Pujol, Learning to Segment Humans by Stacking their Body Parts, ChaLearn Looking at People, European Conference on Computer Vision, 2014. Slides.
- Xavier Perez-Sala, Fernando De la Torre, Laura Igual, Sergio Escalera, and Cecilio Angulo, Subspace Procrustes Analysis, ChaLearn Looking at People, European Conference on Computer Vision, 2014.
- Sergio Escalera, Xavier Baro, Jordi Gonzalez, Miguel A. Bautista, Meysam Madadi, Miguel Reyes, Víctor Ponce, Hugo J. Escalante, Jamie Shotton, Isabelle Guyon, ChaLearn Looking at People Challenge 2014: Dataset and Results, ChaLearn Looking at People, European Conference on Computer Vision, 2014. Slides.
- Mohammad ali Bagheri, Qigang Gao, Sergio Escalera, Generic Subclass Ensemble: A Novel Approach to Ensemble Classification, International Conference on Pattern Recognition, Estocolmo, 2014.
- Mohammad Ali Bagheri, Gang Hu, Qigang Gao, Sergio Escalera, A Framework of Multi-Classifier Fusion for Human Action Recognition, International Conference on Pattern Recognition, Estocolmo, 2014.
- Meysam Madadi and Sergio Escalera, Color alignment in industrial printing: An application, CVCRD, CVC, Barcelona, 2014. Poster.
- Antonio Hernández, Stan Sclaroff, and Sergio Escalera, Contextual Part Rescoring for Human Pose Estimation, CVCRD, CVC, Barcelona, 2014. Poster.
- Miguel Reyes, José Ramírez-Moreno, Juan R. Revilla, Jesús Lázaro, Ginés Almazán, and Sergio Escalera, Automatic Digital Biometry Analysis System, MiHealth, Barcelona, 2014. Poster.

Publications 2013
- Albert Clapés and Sergio Escalera, SAMEC: Sistema automático de monitorización en entornos cerrados, Cuadernos de Seguridad, Issue 283, pp. 56-61, november 2013.
- Sergio Escalera, Multi-Modal Human Behaviour Analysis from Visual Data Sources, ERCIM News journal, vol. 95, ISSN 0926-4981, Special theme: Image Understanding, October 2013. http://ercim-news.ercim.eu/en95/special/multi-modal-human-behaviour-analysis-from-visual-data-sources http://ercim-news.ercim.eu/images/stories/EN95/EN95-web.pdf
- Laura Igual, Xavier Perez-Sala, Sergio Escalera, Cecilio Angulo, and Fernando De la Torre, Continuous Generalized Procrustes Analysis, Pattern Recognition, PR4883, PII: S0031-3203(13)00327-0, DOI: 10.1016/j.patcog.2013.08.006, 2013.
- Antonio Hernandez-Vela, Miguel Angel Bautista, Xavier Perez-Sala, Victor Ponce, Sergio Escalera, Xavier Baro, Oriol Pujol, and Cecilio Angulo, Probability-based Dynamic Time Warping and Bag-of-Visual-and-Depth-Words for Human Gesture Recognition in RGB-D, Pattern Recognition Letters, PATREC5825, DOI: 10.1016/j.patrec.2013.09.009, 2013.
- Eloi Puertas, Sergio Escalera, and Oriol Pujol, Generalized Multi-scale Stacked Sequential Learning for Multi-class Classification, Pattern Analysis and Applications, 2013.
- Miguel Reyes, Albert Clapés, José Ramírez, Juan R. Revilla, Sergio Escalera, Automatic Digital Biometry Analysis based on Depth Maps, Computers in Industry, DOI 10.1016/j.compind.2013.04.009, 2013.
- Miguel Ángel Bautista, Sergio Escalera, Oriol Pujol, On the Design of an ECOC-Compliant Genetic Algorithm, Pattern Recognition, 2013.
- Mohammad Ali Bagheri, Qigang Gao, and Sergio Escalera, A Genetic-based Subspace Analysis Method for Improving Error-Correcting Output Coding, Pattern Recognition, 2013.
- Albert Clapés, Miguel Reyes, and Sergio Escalera, Multi-modal User Identification and Object Recognition Surveillance System, Pattern Recognition Letters, Special Issue SUBA, 2013.
- Xavier Pérez-Sala, Cecilio Angulo, and Sergio Escalera, 2D deformable models from 3D data, CVCRD, CVC, Barcelona, 2014.
- Sergio Escalera, Jordi Gonzàlez, Xavier Baró, Miguel Reyes, Oscar Lopés, Isabelle Guyon, Vassilis Athitsos, Hugo J. Escalante, Multi-modal Gesture Recognition Challenge 2013: Dataset and Results, Chalearn Multi-Modal Gesture Recognition Workshop, International Conference on Multimodal Interaction, ICMI, 2013. Slides.
- Jordi Abella, Raúl Alcaide, Anna Sabaté, Joan Mas, Sergio Escalera, Jordi Gonzàlez, and Coen Antens, Multi-modal Descriptors for Multi-class Hand Pose Recognition in Human Computer Interaction Systems, Chalearn Multi-Modal Gesture Recognition Workshop, International Conference on Multimodal Interaction, ICMI, 2013
- Sergio Escalera, Jordi Gonzàlez, Xavier Baró, Miguel Reyes, Isabelle Guyon, Vassilis Athitsos, Hugo J. Escalante, Leonid Sigal, Antonis Argyros, Cristian Sminchisescu, Richard Bowden, and Stan Sclaroff, ChaLearn Multi-Modal Gesture Recognition 2013: Grand Challenge and Workshop Summary, Chalearn Multi-Modal Gesture Recognition Workshop, International Conference on Multimodal Interaction, ICMI, 2013. Slides.

- Víctor Ponce-López, Sergio Escalera, and Xavier Baró, Multi-modal Social Signal Analysis for Predicting Agreement in Conversation Settings, Chalearn Multi-Modal Gesture Recognition Workshop, International Conference on Multimodal Interaction, ICMI, 2013. Slides.
- Alex Pardo, Albert Clapes, Sergio Escalera, and Oriol Pujol, Actions in Context: System for people with Dementia, 2nd International Workshop on Citizen Sensor Networks (Citisen2013) at the European Conference on Complex Systems (ECCS'13), Barcelona, 2013.
- S. Grau, A. Puig, S. Escalera, and M. Salamó, Intelligent Interactive Volume Classification, Pacific Graphics 2013, B. Levy, X. Tong, and KK. Yin (Guest Editors), Volume 32 (2013), Number 7, 2013.
- S. Grau, A. Puig, S. Escalera, M. Salamo, O. Amoros, Efficient complementary viewpoint selection in volume rendering, WSCG 2013 21st WSCG Conference on Computer Graphics, Visualization and Computer Vision 2013 in cooperation with the Eurographics Association, 2013. Slides.
- Daniel Sánchez, Tomás Pérez, Miguel Ángel Bautista, Sergio Escalera Human Limb Segmentation based on Error-Correcting Output Codes and Graph Cuts Optimization, CVCRD2013, CVC, Barcelona, 2013. Slides. Poster.
- Meysam Madadi, Sergio Escalera, Jordi Gonzàlez, F. Xavier Roca, and Felipe Lumbreras, Depth-based Multi-part Body Segmentation, CVCRD2013, Barcelona, 2013. Slides. Poster.
- Frederic Sampedro and Sergio Escalera, Static and dynamic tumor quantification in PET scans, CVCRD2013, CVC, Barcelona, 2013. Slides. Poster.
- Marc Oliu and Sergio Escalera. Fast face and eye centre detection in still images CVCRD2013, CVC, Barcelona, 2013.
- Meysam Madadi, Sergio Escalera, Jordi Gonzàlez, F. Xavier Roca, and Felipe Lumbreras, Depth-based Multi-part Body Segmentation, CVCRD2013, CVC, Barcelona, 2013. Slides. Poster.
- Antonio Hernández-Vela, Sergio Escalera, Stan Sclaroff, RGB vs. Depth: Human Pose Recovery and Gesture Recognition, CVCRD2013, CVC, Barcelona, 2013.
- Cristina Palmero, Albert Clapés, Chris Bahnsen, Andreas Møgelmose, Sergio Escalera, Tomas B. Moeslund, Tri-modal Human Body Segmentation, CVCRD2013, CVC, Barcelona, 2013. Poster. Slides.
- Andreas Møgelmose, Chris Bahnsen, Thomas B. Moeslund, Albert Clapes, Sergio Escalera, Tri-modal Person Re-identification with RGB, Depth and Thermal Features, Perception Beyond the Visible Spectrum first IEEE Workshop, Computer Vision and Pattern Recognition, 2013. Slides
- Vitaliy Konovalov, Albert Clapes, and Sergio Escalera, Automatic Hand Detection in RGB-Depth Data Sequences, Catalan Conference on Artificial Intelligence, CCIA 2013. Slides.
- Alvaro Cepero, Albert Clapes, and Sergio Escalera, Quantitative analysis of non-verbal communication for competence analysis, Catalan Conference on Artificial Intelligence, CCIA 2013. Selected paper for AI communications. Slides.
- Mohammad ali Bagheri, Qigang Gao, and Sergio Escalera, Logo recognition Based on the Dempster-Shafer Fusion of Multiple Classifiers. Canadian AI Conference, 2013. Best paper award.
- D. Sánchez, and J.C. Ortega, and M.A. Bautista, Human Body Segmentation with Multi-limb Error-Correcting Output Codes Detection and Graph Cuts Optimization, 6th Iberian Conference on Pattern Recognition and Image Analysis, IBPRIA, Madeira, Portugal, 2013. Selected paper for Neurocomputing. Slides.
- Victor Ponce-López, Sergio Escalera, and Xavier Baró, Multi-modal Non-Verbal Communication Analysis in Victim-Offender Mediation Sessions. Universitat Oberta de Catalunya Symposium, 2013. Poster. Slides.
- Sergio Escalera, Oriol Pujol, and Josep Moya, Automatic Monitoring and Image Analysis on eHealth, NeuroRescue Final Conference, 2013. Poster.
- Sergio Escalera, Oriol Pujol, and Josep Moya, Automatic Monitoring and Image Analysis on eHealth, INNO4AGEING 2013, 12th-13th DECEMBER, 2013, 2nd EDITION, VENUE: UVic Auditorium, Barcelona-Catalonia, Spain. Poster.

Publications 2012

- Laura Igual, Joan Carles Soliva, Antonio Hernandez-Vela, Sergio Escalera, Oscar Vilarroya, Petia Radeva, A Supervised Graph-cut Deformable Model for Brain MRI Segmentation, Deformation Models, Tracking, Animation and Applications, Series: Lecture Notes in Computational Vision and Biomechanics, Vol. 7, González Hidalgo, Manuel; Mir Torres, Arnau; Varona Gómez, Javier (Eds.), 2012, 350 p, ISBN 978-94-007-5445-4.
- Antonio Hernández-Vela, Miguel Reyes, Víctor Ponce, and Sergio Escalera, GrabCut-Based Human Segmentation in Video Sequences, Sensors, Volume 12, Issue 11, 15376-15393; doi:10.3390/s121115376, 2012.
- Antonio Hernández-Vela, Carlo Gatta, Sergio Escalera, Laura Igual, Victoria Martín-Yuste, Manel Sabaté, and Petia Radeva, Accurate coronary centerline extraction, caliber estimation, and catheter detection in angiographies, Transactions on Information Technology inBioMedicine, 2012.
- Laura Igual, Joan Carles Soliva, Sergio Escalera, Roger Giménez, Oscar Vilarroya, Petia Radeva, Automatic Brain Caudate Nuclei Segmentation and Classification in Diagnostic of Attention-Deficit/Hyperactivity Disorder, Computerized Medical Imaging and Graphics, 2012. Media news.
- Antonio Hernández-Vela, Nadezhda Zlateva, Alexander Marinov, Miguel Reyes, Petia Radeva, Dimo Dimov, and Sergio Escalera, Human Limb Segmentation in Depth Maps based on Spatio-Temporal Graph Cuts Optimization, Journal of Ambient Intelligence and Smart Environments JAISE, 2012.

- Sergio Escalera, Xavier Baró, Jordi Vitrià, Petia Radeva, and Bogdan Raducanu, Social Network Extraction and Analysis Based on Multimodal Dyadic Interaction, Sensors 2012, 12(2), 1702-1719; doi:10.3390/s120201702, http://www.mdpi.com/1424-8220/12/2/1702/pdf, –http://www.mdpi.com/1424-8220/12/2/1702/manuscript, 2012.
- Albert Clapés, Alex Pardo, Miguel Reyes, Sergio Escalera, and Oriol Pujol, Intelligent Homecare Assistive Technology for People with Dementia in Smart Cities, Smart Cities Expo World Congress, Barcelona, Spain, 2012. Poster.
- Mohammad Ali Bagheri, Qigang Gao, and Sergio Escalera, Rough Set Subspace Error-Correcting Output Codes, IEEE International Conference on Data Mining, Brussels, Belgium, 2012. Slides.
- Miguel Angel Bautista, Sergio Escalera, Xavier Baró and Oriol Pujol, A Genetic Inspired Optimization for ECOC, Joint IAPR International Workshops on Structural and Syntactic Pattern Recognition and Statistical Techniques in Pattern Recognition, International Conference on Pattern Recognition, 2012.
- Miguel Angel Bautista, Oriol Pujol, and Sergio Escalera, Multi-label classification via Error-Correcting Output Codes, CVCRD2012: Advances in Theory and Applications of Computer Vision, Computer Vision Center, Barcelona, Spain, pp. 6-7, 2012.
- Victor Ponce, Sergio Escalera, Xavier Baro, Social Signal Analysis in Criminal Mediation Processes, CVCRD2012: Advances in Theory and Applications of Computer Vision, Computer Vision Center, Barcelona, Spain, pp. 37-38, 2012. Poster. Slide.
- Miguel Reyes, Albert Clapes, and Sergio Escalera, Musculoskeletal disorders analysis using RGBD data, CVCRD2012: Advances in Theory and Applications of Computer Vision, Computer Vision Center, Barcelona, Spain, pp. 39, 2012.
- Antonio Hernandez-Vela, Victor Borjas, Sergi Grau, Sergio Escalera, and Petia Radeva, AND/OR Graph-based Human Pose Recovery from Depth Images, CVCRD2012: Advances in Theory and Applications of Computer Vision, Computer Vision Center, Barcelona, Spain, pp. 27, 2012.
- Miguel Ángel Bautista, Antonio Hernandez-Vela, Victor Ponce, Xavier Perez-Sala, Xavier Baró, Oriol Pujol, Cecilio Angulo, and Sergio Escalera, Probability-based Dynamic TimeWarping for Gesture Recognition on RGB-D data, International Workshop on Depth Image Analysis ICPR, 2012. Slides.
- Miguel Reyes, Albert Clapés, Sergio Escalera, José Ramírez, and Juan R. Revilla, Posture Analysis and Range of Movement Estimation using Depth Maps, International Workshop on Depth Image Analysis, ICPR, 2012. Slides.
- Antonio Hernandez-Vela, Miguel Angel Bautista, Xavier Perez-Sala, Victor Ponce, Xavie Baró, Oriol Pujol, Cecilio Angulo, and Sergio Escalera,BoVDW: Bag-of-Visual-and-Depth-Words for Gesture Recognition, ICPR, 2012.
- Miguel Reyes, Albert Clapes, Jose Ramirez, Juan Ramon Revilla, and Sergio Escalera, Static and Dynamic Body Analysis in Physiotherapy and Rehabilitation, International Conference on Neurorehabilitation, Converging Clinical and Engineering Research on Neurorehabilitation Biosystems & Biorobotics Volume 1, 2013, pp 793-797, ICNR, Toledo, 2012. Poster.
- Xavier Pérez-Sala, Sergio Escalera, and Cecilio Angulo, Survey on 2D and 3D Human Pose Recovery, Congres Catala en Intel·ligencia Artificial, CCIA 2012.
- Sergio Escalera, Josep Moya, Laura Igual, Verónica Violant, M.Teresa Anguera, Análisis Comportamental Automatizado de TDAH: la Influencia de la Variable Motivación, IPSI – Cosmocaixa, Jornadas "Empremtes del present, efectes en la psicoanàlisi, la cultura i la societat", 2012. Poster.
- Laura Igual, Joan Carles Soliva, Antonio Hernández-Vela. Sergio Escalera, Oscar Vilarroya, Petia Radeva, Supervised Brain Segmentation and Classification in Diagnostic of Attention-Deficit/Hyperactivity Disorder, HPCS, 2012, Madrid.
- Albert Clapés, Miguel Reyes, and Sergio Escalera, User Identification and Object Recognition in Clutter Scenes Based on RGB-Depth Analysis, Articulated Motion of Deformable Objects, LNCS 7378, pp. 1–11, Mallorca, 2012.
- Sergio Escalera, Human Behavior Analysis From Depth Maps, F.J. Perales, R.B. Fisher, and T.B. Moeslund (Eds.): AMDO 2012, LNCS 7378, pp. 282–292. Springer, Heidelberg (2012). Slides.
- Mohammad ali Bagheri, Qigang Gao, and Sergio Escalera, Three-Dimensional Design of Error Correcting Output Codes, 8th International Conference on Machine Learning and Data Mining MLDM 2012 July 13-20, 2012, Berlin/Germany.
- Mohammad ali Bagheri, Qigang Gao, and Sergio Escalera,Error Correcting Output Codes for multiclass classification: Application to two image vision problems, AISP 2012 : the 16th symposium on Artificial Intelligence & Signal Processing, May 2, 2012 – May 3, 2012 , Shiraz, Iran.
- Sergio Escalera, Josep Moya, Laura Igual, Verónica Violant, and M. Teresa Anguera, Automatic Human Behavior Analysis in ADHD, Eunethydis 2nd International ADHD Conference, Barcelona, 2012. Poster.
- Mohammad Ali Bagheri, Qigang Gao, and Sergio Escalera, Efficient pairwise classification using Local Cross Off strategy, Canadian Conference on Artificial Intelligence 2012, 28/05/2012-30/05/2012, Toronto, Ontario, 2012. Slides.
- Laura Igual, Joan Carles Solivay, Roger Gimeno, Sergio Escalera, Oscar Vilarroyay, and Petia Radeva, Automatic Internal Segmentation of Caudate Nucleus for Diagnosis of Attention Deficit Hyperactivity Disorder, International Conference on Image Analysis and Recognition ICIAR 2012, 25/06/2012-27/06/2012, Aveiro, Portugal, 2012. Poster.

- Antonio Hernández-Vela, Nadezhda Zlateva, Alexander Marinov, Miguel Reyes, Petia Radeva, Dimo Dimov, and Sergio Escalera, Graph Cuts Optimization for Multi-Limb Human Segmentation in Depth Maps, IEEE Computer Vision and Pattern Recognition conference, 16/06/2012-21/06/2012, Providence, Rhode Island, 2012. Public data. Video.
- José Ramírez-Moreno, Juan Ramón Revilla, Miguel Reyes, Albert Clapés, and Sergio Escalera, Système ADIBAS® posture: mesure de la posture en 3D avec multicapteur Kinect®, Mezieres physiotherapy Burdeos conference, France, 2012.
- O. Lopes, M. Pousa, M. Reyes, S. Escalera, and J. Gonzalez, Multi Hand Pose Recognition System using Kinect Depth Sensor, Kinect Demonstrator Challenge, International Conference in Pattern Recognition, ICPR, 2012. Video sample. Poster. Slides. Third prize.
- Miguel Angel Bautista, Antonio Hernández-Vela, Laura Igual, Josep Moya, Verónica Violant, Oriol Pujol, and Sergio Escalera, Automatic Behaviour Analysis for supporting ADHD Diagnose, Donders Discussions, Holland, 2012. Presentation.
- Antonio Hernández-Vela, Miguel Angel Bautista, Laura Igual, Josep Moya, Verónica Violant, Oriol Pujol, and Sergio Escalera, ADHD Indicators Modelling based on Dynamic Time Warping and Bag of Words from RGBD Data, Donders Discussions, Holland, 2012. Poster.
- Josep Tarrés, Oriol Janés, Sergio Escalera, Oriol Pujol, Manuel Moreno, Universitat Politècnica de Catalunya, Mathematical formulas in a graphical context: From dual calculator to app to specific market, Tic i Salut, Gerona, 2012. Additional material. Demo sample.
- Miguel Reyes, Albert Clapés, José Ramírez-Moreno, Juan Ramón Revilla, and Sergio Escalera, Automatic Digital Biometry Analysis System, Tic i Salut, Gerona, 2012.Video.

RESEARCH PROJECTS AND TRANSFERENCE ACTIVITY (selection)
    TRANSFERENCE
- **Principal investigator in more than 20 transfer** projects with companies **(> 500K€)**
- Transfer projects for **Microsoft Research** and IP **(> 200K€)**
    COMPETITIVE PROJECTS (selection)
- **From European Commission (participation in 7 projects from European Commission)**: Hermes 2007-2010, WIDER – Green Growing of SMEs: Innovation and Development in the Energy Sector in the Mediterranean Area 2015, TeSLA 2016-2018, Disriptive OnLine Stylist Engine by Value Agents 2015, SEE.4C – SpatiotEmporal ForEcasting: Coopetition to meet Current Cross-modal Challenges 2016-2017, Cost Action: Integrating Vision & Language 2014-2018, Adibas Posture 2017, iCARE H2020 project 2014-2018. **(> 500K€)**
- **Spanish government granted projects (> 200K€)**

LIST OF SELECTED PROJECTS OF THE LAST FIVE YEARS 2012-2017

Title of the project / contract: ChaLearn Looking at People challenge organizations
Financing Firm/administration: Microsoft Research
Number of the project / contract: --- **Amount (overheads included):** 120.000,00 **Duration, since:** 2015 **Until:** 2016
Researcher/s in charge: Sergio Escalera Guerrero
Number of researchers participating: 3

Title of the project / contract: DISRUPTIVE ON-LINE STYLIS, SME Instrument - H2020
Financing Firm/administration: EU, H2020
Number of the project / contract: DISRUPTIVE ON-LINE STYLIS **Amount (overheads included):** 50.000,00 **Duration, since:** 2015 **Until:** 2016
Researcher/s in charge: Joan Francesc Puyol
Number of researchers participating: 6

Title of the project / contract: ChaLearn Looking at People challenge organizations
Financing Firm/administration: Microsoft Research
Number of the project / contract: --- **Amount (overheads included):** 120.000,00 **Duration, since:** 2015 **Until:** 2016
Researcher/s in charge: Sergio Escalera Guerrero
Number of researchers participating: 3

Title of the project / contract: iCARE - H2020
Financing Firm/administration: EU, H2020

Number of the project / contract: iCARE **Amount (overheads included):** 2.000.000,00 **Duration, since:** 2014 **Until:** 2016

Researcher/s in charge: Astrid Van Wieringen

Number of researchers participating: 21

Title of the project / contract: Integrating Biometrics and Forensics for the Digital Age

Type of contract/Program: Acciones COST

Financing Firm/administration: COST PROGRAM

Number of the project / contract: ICT COST Action IC1106 **Amount (overheads included):** --- **Duration, since:** 2011 **Until:** 2014

Researcher/s in charge: Massimo Tistarelli

Number of researchers participating: 20

Title of the project / contract: MEDIMINDER: SISTEMA AUTÓNOMO DOMÉSTICO ASISTENCIAL PARA PACIENTES CON DEMENCIA Y ALZHEIMER

Type of contract/Program: Ayudas a la Investigación

Financing Firm/administration: Instituto de Mayores y Servicios Sociales (IMSERSO)

Institutions participating: Ministerio de Sanidad, Política Social e Igualdad

Number of the project / contract: 247/2011 DE 15-04-2011 **Amount (overheads included):** 41.000,00 **Duration, since:** 2012 **Until:** 2012

Researcher/s in charge: Sergio Escalera

Number of researchers participating: 2

Title of the project / contract: Sistema automático de visión artificial para el asesoramiento en diálogo jurídico y soporte a la víctima

Type of contract/Program: Ayudas a la Investigación

Financing Firm/administration: Ministerio de Justicia

Number of the project / contract: JUS/237/2011 **Amount (overheads included):** 5.000,00 **Duration, since:** 2012 **Until:** 2013

Researcher/s in charge: Sergio Escalera

Number of researchers participating: 2

Title of the project / contract: ReMedi: Multi-modal Home Assistive Technology for Dementia and Alzheimer's diseases

Type of contract/Program: Sense especificar

Financing Firm/administration: Fundació Caixa de Pensions 'La Caixa'

Number of the project / contract: Recercaixa-306684 **Amount (overheads included):** 60.401,63 **Duration, since:** 2012 **Until:** 2013

Researcher/s in charge: Oriol Pujol Vila

Title of the project / contract: Preparación de proyectos europeos: AUTOMATIC MULTI-MODAL ANALYSIS OF ATTENTION DEFICIT HIPERACTIVITY DISORDER

Type of contract/Program: Ajuts a la Recerca

Financing Firm/administration: Oficina Projectes Internacionals de Recerca - FBG

Number of the project / contract: --- **Amount (overheads included):** 4.500,00 **Duration, since:** 2012 **Until:** 2012

Researcher/s in charge: Sergio Escalera

Number of researchers participating: 5

Title of the project / contract: Proyecto para el análisis postural automático en fisioterapia

Type of contract/Program: Contracte coordinat (FBG)

Financing Firm/administration: Empresa

Number of the project / contract: 306901 FBG-UB **Amount (overheads included):** 9.000,00 **Duration, since:** 2012 **Until:** 2012

Researcher/s in charge: Sergio Escalera Guerrero
Number of researchers participating: 4

Title of the project / contract: ANÁLISIS COMPORTAMENTAL AUTOMÁTICO EN EL DIAGNÓSTICO DEL TRANSTORNO POR DÉFICIT DE ATENCIÓN CON O SIN HIPERACTIVIDAD: HACIA UN ANÁLISIS MOTIVACIONAL Y REDEFINICIÓN DEL CONSTRUCTO
Type of contract/Program: Ajuts per a la realització de projectes de recerca dels àmbits de les ciències socials i les humanitats [Batista i Roca] (PBR)
Financing Firm/administration: Universitat de Barcelona
Number of the project / contract: --- **Amount (overheads included):** 9.800,00 **Duration, since:** 2013 **Until:** 2013
Researcher/s in charge: Antoni Benseny Ardiaca
Number of researchers participating: 4

Title of the project / contract: Development of an automatic system for face detection and analysis in visual data from controlled environments
Financing Firm/administration: Geyce
Number of the project / contract: FBG 307377 **Amount (overheads included):** 8.216,43 **Duration, since:** 2013 **Until:** 2013 **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Project EU-PLF KBBE.2012.1.1-02-311825: Bright Farm by Precision Livestock Farming. Aimed to precision livestock farming in Europe
Financing Firm/administration: Comisión Europea
Number of the project / contract: KBBE.2012.1.1-02-311825 **Amount (overheads included):** --- **Duration, since:** 2013 **Until:** 2014 **Researcher/s in charge:** Heiner Lehr

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Title of the project / contract: QR codes analysis for the farming industry
Financing Firm/administration: Agropecuària Catalana SCCL (Agrocat)
Institutions participating: ---
Number of the project / contract: FBG 307449 **Amount (overheads included):** 10.291,00 **Duration, since:** 2013 **Until:** 2013 **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Anàlisi i correcció de variacions en el color de dos mostres de paper imprès per laminats - Lamigraf
Financing Firm/administration: Empresa
Number of the project / contract: FBG 307440 **Amount (overheads included):** 16.950,00 **Duration, since:** 2013 **Until:** 2014 **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: VISITT project CVC-ASCAMM within SUMA spanish call
Financing Firm/administration: Generalitat de Catalunya
Number of the project / contract: VISITT2014 **Amount (overheads included):** 60.000,00 **Duration, since:** 2014 **Until:** 2014 **Researcher/s in charge:** Josep Llados Canet

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Title of the project / contract: VICYCLE - Un marco de visión por computador basado en un ciclo de análisis-síntesis inspirado en el sistema cognitivo humano
Financing Firm/administration: ministerio de ciencia
Number of the project / contract: TIN2013-43478-P **Amount (overheads included):** 12.000,00 **Duration, since:** 2014 **Until:** 2016 **Researcher/s in charge:** Oriol Pujol Vila
Number of researchers participating: 8

Title of the project / contract: Grup de Visió i Aprenentatge Computacional - Vision and Computational Learning (VCL)
Type of contract/Program: Sense especificar
Financing Firm/administration: Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR)
Number of the project / contract: 2014SGR561 **Amount (overheads included):** 0 **Duration, since:** 2014 **Until:** 2016
Researcher/s in charge: Oriol Pujol Vila
Number of researchers participating: 8

Title of the project / contract: Codis QR
Financing Firm/administration: Empresa
Number of the project / contract: FBG-307730 **Amount (overheads included):** 24.000,00 **Duration, since:** 2014 **Until:** 2014 **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Aplicació TIC als conreus del Delta de l'Ebre
Financing Firm/administration: Cooperativa Arrossaires del Delta de l'Ebre i Secció de Crèdit SCCL
Number of the project / contract: 307810 **Amount (overheads included):** 28.000,00 **Duration, since:** 2014 **Until:** 2014 **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Software de segmentació i recomanació de roba
Type of contract/Program: Sense especificar
Financing Firm/administration: Value Agents, S.L.
Number of the project / contract: 307824 **Amount (overheads included):** 18.000,00 **Duration, since:** 2014 **Until:** 2014 **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Desenvolupament d'un sistema automàtic per a la detecció i anàlisis de cares sobre dades visuals en entorns controlats
Type of contract/Program: Sense especificar
Financing Firm/administration: Geyce
Number of the project / contract: 307855 **Amount (overheads included):** 18.000,00 **Duration, since:** 2014 **Until:** 2015 **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Computer Vision system for mattress recommendation
Financing Firm/administration: Dormity
Number of the project / contract: DORMITY-CVC **Amount (overheads included):** 62.000,00 **Duration, since:** 2014
Researcher/s in charge: Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Projecte de lluita contra la pobresa i la prevenció de l'exclusió social i les seves implicacions en el camp de la salut mental
Type of contract/Program: Projectes de la fundació la Caixa
Financing Firm/administration: La Caixa
Number of the project / contract: APPSE-09429-ES14-00457-FP **Amount (overheads included):** 23.770,00 **Duration, since:** 2014 **Until:** 2015 **Researcher/s in charge:** Josep Moya
Number of researchers participating: 12

Title of the project / contract: NeuroChild EyeTracking: Rehabilitación cognitiva de Niños con Daño Cerebral Adquirido basada en Serious Games para dispositivos móviles y con control visual de atención (subcontratación proyecto Sergio Escalera)

Financing Firm/administration: Ministerio de Ciencia e Innovación
Number of the project / contract: RTC-2014-2228-1 **Amount (overheads included):** 120.000,00 **Duration, since:** 2014 **Until:** 2016   **Researcher/s in charge:** ICA INFORMATICA

Title of the project / contract: Plataforma Better At Home Solución integral de teleasistencia (indoor & outdoor) basada en monitorización mediante sensores, sistemas de autoaprendizaje y tecnología móvil
Financing Firm/administration: Ministerio de Ciencia e Innovación
Number of the project / contract: RTC-2014-2148-1 **Amount (overheads included):** 113.000,00 **Duration, since:** 2014 **Until:** 2016
Researcher/s in charge: TECMOVA E-ASISTENCIA SL

Title of the project / contract: Anàlisi de la qualitat d'empremta dactilar a imatge
Type of contract/Program: Sense especificar
Financing Firm/administration: Geyce
Number of the project / contract: 308070 **Amount (overheads included):** 23.529,41 **Duration, since:** 2015 **Until:** 2015   **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Integració de KETs pel control sostenible de plagues en el conreu de l'arròs
Financing Firm/administration: Cooperativa Arrossaires del Delta de l'Ebre i Secció de Crèdit SCCL
Number of the project / contract: 308276 **Amount (overheads included):** 13.493,00 **Duration, since:** 2015 **Until:** 2015   **Researcher/s in charge:** Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Content-based management and new technologies in agriculture
Financing Firm/administration: Agropecuària Catalana SCCL (Agrocat)
Number of the project / contract: 308285 **Amount (overheads included):** 9.900,00 **Duration, since:** 2015 **Until:** 2015
Researcher/s in charge: Sergio Escalera Guerrero
Number of researchers participating: 2

Title of the project / contract: Care Respite
Financing Firm/administration: La Caixa
Number of the project / contract: CaixaImpulse CareRespite **Amount (overheads included):** 50.000,00 **Duration, since:** 2015 **Until:** 2016
Researcher/s in charge: Sergio Escalera
Number of researchers participating: 4

Title of the project / contract: TeSLA
Financing Firm/administration: EU, H2020
Number of the project / contract: TeSLA **Amount (overheads included):** --- **Duration, since:** 2016 **Until:** 2018
Researcher/s in charge: Xavier Baro
Number of researchers participating: 8

Title of the project / contract: SEE.4C
SpatiotEmporal ForEcasting: Coopetition to meet Current Cross-modal Challenges
Financing Firm/administration: EU, H2020
Number of the project / contract: SEE.4C - H2020 **Amount (overheads included):** 760.606,00 **Duration, since:** 2016 **Until:** 2017   **Researcher/s in charge:** Florin Popescu
Number of researchers participating: 6

Title of the project / contract: Xbadges: Sistema de idenEficación, validación y cerEficación digital de competencias transversales mediante el análisis de la telemetría de videojuegos y la captura e idenEficación de emociones en los rasgos faciales de los usuarios

Financing Firm/administration: Ministerio de Industria, Energía y Turismo

Number of the project / contract: TSI-100600-2015-30 **Amount (overheads included):** --- **Duration, since:** 2016 **Until:** 2017 **Researcher/s in charge:** Flavio Escribano

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Title of the project / contract: Reconocimiento de personas y expresiones faciales

Type of contract/Program: Acción Estratégica de telecomunicaciones y Sociedad de la Información

Financing Firm/administration: Ministerio de Industria, Energía y Turismo

Number of the project / contract: 308611 **Amount (overheads included):** 38.250,00 **Duration, since:** 2016 **Until:** 2017 **Researcher/s in charge:** Sergio Escalera Guerrero **Number of researchers participating:** 8

Title of the project / contract: Intelligent Media Content generation

Financing Firm/administration: CYNNY

Number of the project / contract: --- **Amount (overheads included):** 85.000,00 **Duration, since:** 2016 **Until:** 2017 **Researcher/s in charge:** Sergio Escalera **Number of researchers participating:** 6

Title of the project / contract: Automatic IRIS analysis software based on computer vision

Financing Firm/administration: EYECOS

Number of the project / contract: --- **Amount (overheads included):** 40.000,00 **Duration, since:** 2016 **Until:** 2016 **Researcher/s in charge:** Sergio Escalera **Number of researchers participating:** 3

Title of the project / contract: UN MARCO DE VISION POR COMPUTADOR BASADO EN UN CICLO DE ANALISIS-SINTESIS DE ARQUITECTURAS PROFUNDAS INSPIRADO EN EL SISTEMA COGNITIVO

Financing Firm/administration: Ministerio de Economia y Competitividad

Number of the project / contract: TIN2016-74946-P **Amount (overheads included):** 82.700,00 **Duration, since:** 2016 **Until:** 2018

Researcher/s in charge: Sergio Escalera **Number of researchers participating:** 5

Title of the project / contract: Automatic Digital Biometry Analysis System for musculoskeletal disorders rehabilitation (ADIBAS)

Financing Firm/administration: EU, H2020

Number of the project / contract: SME H2020 ADiBAS **Amount (overheads included):** 50.000,00 **Duration, since:** 2017 **Until:** 2018 **Researcher/s in charge:** 5

Curriculum Vitae

Name
- Henrik Karstoft (hka@eng.au.dk)

Employment
- **Professor (Docent) in Signal Processing, Depart. of Eng., Aarhus University: 2007 - present.**
- Associate Professor, Aarhus School of Engineering: 1995 - 2007.
- Assistant Professor, Aarhus School of Engineering: 1994 - 1995.
- Academic staff memberp, Department of Mathematics, Aarhus University: 1993 - 1994.
- R&D Engineer, Department of Research and Development, TDC A/S: 1991 - 1993.

Education
- **PhD.** In Mathematics 'Moduli Spaces of Homogeneous Connections on 4 Manifolds', Aarhus University: 1988 - 1991.
- **MSc.** in Mathematics, BSc. in Physics and BSc. in Computer Science, Aarhus University: - 1988.

Research profile
Main research interest is **applications of Computer Vison and Machine learning**, focused on agricultural and biomedical applications. In particular, Image Object Classification and Segmentation, Deep Learning and Sensor Signal Processing. Supervision of 6 Ph.D. students and 2 Post Doc.'s in total. Currently the Signal Processing Group consists of: 1 Docent, 1 Senior Researcher, 1 Assistant Professors, 2 Post Doc. and 5 PhD. students and 2 Research Assistens.

Other relevant experience
- Head of the MSc. program in Computer Engineering and MSc. program in Electrical Engineering at Aarhus University, Department of Engineering.
- Member of Academic Counsel, Science and Technology, Aarhus University, 2016 -.
- Supervisor for 50+ thesis students (MSc. Engineering), 65+ bachelor projects (BSc. Engineering).
- Taught 60+ bachelor and master courses in Signal Processing, Computer Vision, Machine Learning and Mathematics.
- External examiner for 7 PhD. theses.
- Member of the Danish External Examiner Corps in Mathematics, with 30+ assignments on master and bachelor level and member of the Danish External Examiner Corps in Engineering, with 40+ assignments on master and bachelor level.
- Reviewer for Danish National Advanced Technology Foundation (HTF), 2012.
- Journal reviewer for Sensors, Biosystems Engineering.

Publications
51 publications in journals, conferences etc.: http://pure.au.dk/portal/da/persons/id(c480641b-0aa0-49ff-884c-c569e7645ce2).html

Three selected publications from 2016:
1. Christiansen P., Nielsen L., Steen KA., Nyholm Jørgensen R. & Karstoft H. 2016, 'DeepAnomaly: Combining Background Subtraction and Deep Learning for Detecting Obstacles and Anomalies in an Agricultural Field' *Sensors*, vol 16, nr. 11, 1904.
2. Dyrmann M., Karstoft H. & Midtiby HS. 2016, 'Plant species classification using deep convolutional neural network' *Biosystems Engineering*, vol 151, nr. November, s. 72-80.
3. Steen KA., Christiansen P., Karstoft H. & Nyholm Jørgensen R., 2016, 'Using Deep Learning to Challenge Safety Standard for Highly Autonomous Machines in Agriculture' *Journal of Imaging*, vol 2, nr. 1, 6.

Fortegnelse over bedømmelsesudvalg til
stilling 50119 Professor with Specific Responsibilities in Computer Science (50119) ved Department of Computer Science

Navn: Professor Peter Axel Nielsen
Arbejdssted: Department of Computer Science, AAU
E-mail: pan@cs.aau.dk

Navn: Professor Flemming Nielson
Arbejdssted: DTU
E-mail: fnie@dtu.dk

Navn: Professor Michel Raynal
Arbejdssted: IRISA-ISTIC, Universit'e de Rennes
E-mail: michel.raynal@irisa.fr

Navn: Professor Joost-Pieter Katoen
Arbejdssted: University of Twente
E-mail: katoen@cs.rwth-aachen.de

Navn: Professor Francesco Ricci
Arbejdssted: Free University of Bozen-Bolzano
E-mail: Francesco.Ricci@unibz.it

Navn: Professor Susanne Bødker
Arbejdssted: AU
E-mail: bodker@cs.au.dk

Akademisk Råd har taget stilling til, at medlemmer af bedømmelsesudvalget er sagkyndige inden for stillingsområdet på et niveau, der mindst svarer til det, der forudsættes for stillingen, dog ikke under lektorniveau.

Professor with Specific Responsibilities in Computer Science (50119)

Position No.
50119

Godkendt d. 29.11.16
Eskild Hohlmann Bertelsen

At the Faculty of Engineering and Science, Department of Computer Science, two positions as Professor with Special Responsibilities in Computer Science are open for appointment starting August 1, 2017 or soon thereafter. The positions are available for a period of 5 years.

The Department of Computer Science has numerous interrelated activities within research, education, co-operation with the surrounding society, and research dissemination in the computer science area.

Job description

The department has three research groups:

Database, Programming and Web technologies (DPW) with particular emphasis on data-intensive systems, spatio-temporal data management, data analytics and mining, programming technologies, and web science and engineering.
http://www.cs.aau.dk/research/database-and-programming-technologies/

Distributed, Embedded and Intelligent Systems (DEIS) with particular emphasis on foundational and logical theories, algorithms and tools for verification and validation, methodologies for real-time and embedded systems, networks and operating systems, probabilistic graphical models and machine learning.
http://www.cs.aau.dk/research/distributed-embedded-intelligent-systems/

Information Systems (IS) with particular emphasis on development and use of computerised systems in organisations, human-computer interaction, usability, interaction design, software development, and innovation.
http://www.cs.aau.dk/research/information-systems/

The department offers a broad range of computer science educations at all levels as well as in relation to continued professional development.
Job Description

A position as Professor with Specific Responsibilities is fixed-term and spans specific projects as well as ordinary professorial duties. The position is normally made available with for the purpose of appointing particularly talented researchers with the ability to develop a promising academic field at an international level.

For the announced positions, the specific purpose is to strengthen core research activities in the department. In particular, a successful applicant is expected to establish a portfolio of externally funded projects within one of the following areas: Distributed systems (DEIS), formal systems (DEIS), intelligent systems (DEIS/DPW), interactive systems (IS), or programming systems (DPW).

Successful applicants are assigned to one of the department's research groups based on their specific research profile. At least one of the announced positions will be filled within the areas covered by the Distributed, Embedded and Intelligent Systems group. At the end of the employment period, the special responsibilities are discontinued, and the employee is transferred to a position as Associate Professor.

For further information, contact Head of Department, Associate Professor Kristian G. Olesen, (+45) 9940 9852 or by email: kgo@cs.aau.dk.

Qualification requirements:

The level of qualifications shall correspond to that of ordinary positions as Professor; however, also the potential of the candidate to further develop the academic fields in question as well as a documented original scientific production are taken into consideration. An assessment of the ability of the candidate to undertake the specific projects related to the position will be emphasized. Furthermore, the candidate will be expected to have the qualifications required for undertaking teaching responsibilities.

The application must contain the following:
- Text motivating the application, covering the reasons for applying, qualifications in relation to the position, and intentions and visions for the position.
- A curriculum vitae.
- Copies of relevant diplomas (Master of Science and PhD). On request you could be asked for an official English translation.
- A complete list of publications with an indication of the publications the applicant wishes to be considered.
- Up to 10 publications.
- A teaching portfolio covering teaching qualifications. If no portfolio is enclosed, an explanation for its absence must be included.
- A coverage of dissemination qualifications, including participation on committees or boards, participation in organisations, and the like.
- Additional qualifications in relation to the position. (optional)
- References/recommendations. (optional)
- Personal data.

The applications are only to be submitted online by using the "Apply online" button below.

For further information concerning the application procedure please contact Nickie Kate Hermansen by email **nkh@adm.aau.dk** or phone (+45) 9940 9940 / (+45) 9940 7902.

Information regarding guidelines, ministerial circular in force, teaching portfolio and procedures can be seen here.

Workplace
Aalborg

Agreement
Employment is in accordance with the Ministerial Order on the Appointment of Academic Staff at Universities (the Appointment Order) and the Ministry of Finance's current Job Structure for Academic Staff at Universities. Employment and salary are in accordance with the collective agreement for state-employed academics.

Deadline
01/03/2017

Apply online

Aalborg University (AAU) conducts teaching and research to the highest level in the fields of humanities, engineering, and natural, health, and social sciences.

top

HR-TECH

Fra:	Helle Westmark
Sendt:	2. maj 2017 12:09
Til:	HR-TECH
Cc:	Peter Axel Nielsen; CS journal; Kristian G. Olesen
Emne:	Indstilling af bedømmelsesudvalg vedrørende stilling nr. 50119 (professor mso.)
Vedhæftede filer:	RE: Professor assessment committee; RE: Professor assessment committee; FW: Bedømmelsesudvalg til MSO-professorater; FW: Bedømmelsesudvalg til MSO-professorater; RE: Professor assessment committee; FW: Professor assessment committee; LONG-CV-FN-16.pdf

Hej Anne / Nickie,

Institut for Datalogi ønsker at indstille følgende 6 bedømmere til bedømmelsesudvalget vedrørende stilling nr. 50119 (professor mso.)

Vi indstiller undtagelsesvis et seksmandsudvalg, hvilket er accepteret af rektor.
Det skyldes at opslaget dækker fem fagligheder, der alle skal kunne bedømmes sagligt og fagligt forsvarligt. Det har ikke været muligt, at finde bedømmere, der kan dække flere områder, og der kan ikke findes en intern formand indenfor et af områderne uden at vedkommende har habilitetsproblemer.

1. Professor Flemming Nielson, (CV vedlagt), DtU, fnie@dtu.dk
2. Professor Michel Raynal, IRISA-ISTIC, Universit´e de Rennes, michel.raynal@irisa.fr
3. Professor Joost-Pieter Katoen, University of Twente, katoen@cs.rwth-aachen.de
4. Professor Franscesco Ricci, Free University of Bozen-Bolzano, Francesco.Ricci@unibz.it
5. Professor Susanne Bødker, AU, bodker@cs.au.dk, CV http://pure.au.dk/portal/da/persons/susanne-boedker(87d4fbb6-b38c-449e-b87d-59f693b7d6f0)/cv.html?id=40299654
6. Professor Peter Axel Nielsen, AAU pan@cs.aau.dk (formand)

Vedlagt findes accept, CV (eller link til CV) for alle eksterne bedømmere.

Hilsen Helle Westmark
House of Computer Science

Anne Christoffersen

Fra:	Søren Vaagholt Nielsen
Sendt:	31. marts 2017 09:05
Til:	Anne Christoffersen
Emne:	SV: vedr. udvidet bedømmelsesudvalg

Hej Anne

Det er rektor, som dispenserer for dette. Rektor siger ok til denne dispensation.

Med venlig hilsen

Søren Vaagholt Nielsen
Specialkonsulent | HR-afdelingen

T: (+45) 9940 3881 | E:svn@adm.aau.dk | W:www.hr.aau.dk
Aalborg Universitet | Fredrik Bajers Vej 7F | 9220 Aalborg Øst

AALBORG UNIVERSITET

Fra: Anne Christoffersen
Sendt: 29. marts 2017 11:40
Til: Søren Vaagholt Nielsen
Emne: vedr. udvidet bedømmelsesudvalg

Hej Søren,

Jf. vores snak i går om dispensation til nedsættelse af et bedømmelsesudvalg på 1 formand og 5 eksterne bedømmere begrundet i at kunne dække hele fagfeltet for i alt 23 ansøgere.

Jeg har forhørt med dekanen, som siger at vi skal gå videre med sagen. Altså han støtter instituttets forslag.

Det fremgår af "Bedømmelsesregler for Aalborg Universitet", at

1.3 Dispensation

Rektor kan efter konkret ansøgning og vurdering dispensere fra de regler, som universitetet har vedtaget inden for Ansættelsesbekendtgørelsens ramme.

Betyder det at rektor skal dispensere, eller?

Jeg vil bede instituttet om at komme med begrundelse som kan udgøre en dispensationsansøgning herfra.

Ring bare, hvis der er noget.

Med Venlig Hilsen

AALBORG UNIVERSITET

CURRICULUM VITAE for Flemming Nielson

Education. Flemming Nielson holds an *MSc (cand.scient.)* from Aarhus University (Denmark, 1981), a *PhD* from Edinburgh University (Scotland, 1984) with external stay at Massachusetts Institute of Technology (USA, 1982-1983), and he was the first to be awarded a *DSc (dr.scient.)* in Computer Science from Aarhus University (Denmark, 1990).

Employment. He is currently *full professor* at DTU Informatics (Denmark, since 2001). Previously he has been visiting professor at the Max Planck Institute for Computer Science in Saarbrücken (Germany, 2000), at Universität des Saarlandes (Germany, 2000), and at Kiel University (Germany, 1992), as well as associate professor at Aarhus University (Denmark, 1989-2001) and Aalborg University (Denmark, 1984-1989).

Research Leadership. He is co-principal investigator of **IDEA4CPS** on *Cyber Physical Systems* (2011-2017) awarded by the Danish Foundation for Basic Research.

He was site leader for the European Union Artemis project *SESAMO* (2012-2015) on *Security and Safety Modelling*. He was the director of **MT-LAB**, a VKR Centre of Excellence (2008-2013) on the *Modelling of Information Technology*. Previously, he has been site leader for numerous European research projects (including *SENSORIA*), overall project leader of the European research project *LOMAPS,* and project leader for numerous national research projects (including *Aspects of Security for Citizens*).

Administrative Leadership. He has been Head of Division for Computer Science and Engineering at DTU during 2002-2006 (being head of up to fifty members of staff) as well as Deputy Head of Department of Informatics and Mathematical Modelling at DTU.

He has passed the Departmental Management Course initiated by the Danish Rectors' Conference and he has taken courses on effective university teaching, coaching, and supervision of PhD-students and assistant professors.

Teaching Experience. He has taught courses on a variety of topics at the BSc-, MSc- and PhD-level: Automata Theory, Principles of Programming Languages, Semantics, Principles of Program Analysis, Abstract Interpretation, Program Transformations, Functional Languages, Safety and Security of Systems, and Stochastic Models and Logics.

He has also taught several international PhD-courses on Operational Semantics, Principles of Program Analysis, Foundations on Security Analysis and Design, and Analysis Methods for Global Computing.

Supervision Experience. He has supervised students at the BSc-, MSc- and PhD-levels and has served as an external examiner at the MSc- and PhD-

levels. He has also supervised several researchers employed as postdocs on his projects.

Research Interests. His previous research focus is:

- *Abstract Interpretation and Denotational Semantics* (circa 1980-1991). Starting with his PhD-studies and for several years to follow, his research focused on the interplay between Denotational Semantics and Abstract Interpretation (which is a powerful technique for static analysis).

- *Type and Effect Systems for Concurrency* (circa 1990-1998). In response to the need to deal with more challenging features of programming languages, in particular concurrency as in Concurrent ML, he changed his approach from Denotational Semantics to Structural Operational Semantics and from Abstract Interpretation to Type and Effect Systems.

- *Flow Logic* (circa 1997-2009). In order to reconcile the nice structured approach of type systems, distinguishing between specification and implementation, with the vast body of techniques in more classical static analysis, he initiated the approach of Flow Logic. The early stages demonstrated the ease with which different programming paradigms could be treated and the ability to transfer methods and insights from one paradigm to another. The later stages pioneered the development of static analysis for process algebras, usually with applications to security in mind, in particular establishing the correctness of cryptographic communication protocols.

- *Quantitative and Qualitative Modelling and Analysis* (circa 2008-2014). As part of the **MT-LAB** Centre of Excellence he studied the interplay between static analysis and model checking and was able to show that model checking could be recast as static analysis (where the other direction was well known). Integrating quantitative considerations into static analysis and model checking he advanced the use of Markov Models for security analyses of embedded systems and service oriented architectures.

His current research focus is on the development of methods and techniques for *proactive security:* conceiving, designing and implementing systems that can be guaranteed to avoid security flaws. The methods and techniques used draw on the variety of techniques used during his career, in particular operational semantics, type and effect systems, static analysis, process algebras, stochastic model checking, and security.

Contact Information: mailto:fnie@dtu.dk or http://www2.imm.dtu.dk/~nielson/ or +45 4525 3735 (landline at work) or +45 4035 3735 (mobile) or +45 4576 3102 (landline at home: Karen Blixens Vej 11, DK-2960 Rungsted Kyst).

Publications. The Trier database lists 55 refereed journal publications and 124 refereed conference publications in his name:

> http://www.informatik.uni-trier.de/~ley/pers/hd/n/Nielson:Flemming

He has published five books ranging from introductory textbooks to research monographs. His H-index is 41 according to Google Scholar.

Professor Michel RAYNAL

Member of Academia Europaea
Senior Member Institut Universitaire de France

IRISA-ISTIC, Université de Rennes 1
Campus de Beaulieu, 35042 Rennes, France

Chair Professor, Hong Kong Polytechnic University

https://www.irisa.fr/prive/raynal/
raynal@irisa.fr

May 2017

Contents

Michel RAYNAL

Senior Member Institut Universitaire de France

Member of Academia Europaea

Full Professor, Université de Rennes 1

IRISA, Campus de Beaulieu, 35042 Rennes, France

Scientific impact (as measured by Google Scholar):

| h-index: 55 | i10-index: 254 | Citations: 10976 |

number of co-authors: 170

1 Curriculum vitæ

▷ Male, French, Born January 16, 1949 (Douelle, Lot, France). Married, one son.

▷ IRISA, Université de Rennes 1, Campus de Beaulieu, 35042 Rennes-cedex, France.

▷ e-mail: raynal@irisa.fr.   Tel (Office): 33 2 99 84 71 88,   http://www.irisa.fr/prive/raynal/

Education

▷ "Doctorat d'Etat" in *Informatics*[1], University of Rennes, 1981.

▷ PhD in *Informatics*, University of Rennes, 1975 (PhD grant from French CNRS).

▷ Engineer diploma (INSA, Rennes), 1973.

▷ French Baccalauréat in Sciences (1968) and Literature (1969).

Professional experience

▷ 2017: *Chair Professor*, Polytechnic University (PolyU), Hong-Kong.

▷ 2015: Elected member of *Academia Europaea*.

▷ 2015: SIROCCO Prize *Innovation in Distributed Computing*.

▷ 2013: *Adjunct Professor*, Polytechnic University (PolyU), Hong-Kong.

▷ 2010: Senior Member, *Institut Universitaire de France* (IUF).

▷ 1989: Full professor, IRISA, University of Rennes, France (Prof. first class 1989, except. class 1998).

▷ 1984-1989: Associate professor, IRISA, University of Rennes, France (Prof. 2d class).

▷ 1984-2002: Founder and head of ADP (Algorithmes distribués et protocoles) research group, IRISA.

▷ 1981-1983: Professor, head of the computer science dpt, ENST (Telecom engineer school), Brest.

▷ 1976-1981: full-time researcher, INRIA, Rennes.

Research interests

▷ Distributed algorithms, distributed computing systems, distributed computability, dependability.

▷ Fundamental principles that underlie the design and construction of distributed computing systems.

On visiting (research/teaching) positions

▷ Lots of stay (two weeks to several months) in a lot of labs and universities all over the world. IBM Almaden (California, USA), University of Santa Barbara (USA), Austin University (USA), Georgia Tech (USA), EPFL (Switzerland), Université de Montréal (Canada), Hong-Kong Polytechnic University, University of Nanjing, University of Guangzhou –Canton– (China), Federal University of Salvador de Bahia (Brazil), UNAM (Mexico), Universidade Rey Juan Carlos (Madrid), University of the Basque Country (San Sebastian, Spain), Konkuk university (Seoul, South Korea), Tokyo Denki university (Japan), Seikei University (Japan), JAIST (Japan), University of Lisboa (Portugal), Università di Roma La Sapienza (Italy), Università di Napoli (Italy), Ecole nationale d'ingénieurs de Tunis (Tunisia), Institut national d'informatique d'Alger (Algeria), Université de Yaoundé (Cameroun), ENSIAS, Rabat (Morocco), Ben Gourion University (Israël).

Outside informatics

▷ I enjoy literature, rugby, hiking, and cats. I am a wine amateur (Vigneron d'honneur de la confrérie de Saint-Emilion) and enjoys Cahors's wine (A *Malbec* that is the darkest wine in the world!).

▷ My Erdös number is 2 (Erdös → Zaks → Raynal).   ▷ Cited in the French Whoswho since 2009.

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[1]As nicely stated by E.W. Dijkstra (1920-2002): "*Computer science is no more about computers than astronomy is about telescopes*". Hence, to prevent ambiguities, I use the "European" word *Informatics* in place of *Computer science*. On a pleasant side, there is no more "computer science" than "washing machine science".

2 Short biography

After obtaining an engineer diploma from INSA (Institut National des Sciences Appliquées de Rennes), I obtained a PhD grant from the CNRS, and defended a PhD (the topic of which was related to synchronization) in 1975. I was then hired as a full-time researcher by IRIA (now INRIA) from 1976 until 1981, where I worked on abstract data types, protection, synchronization, and programming languages. In 1981 I obtained the "Doctorat d'Etat" degree in informatics, the title of which was "Contribution à l'étude de la coopération dans les langages et les systèmes informatiques". Then, I moved to Brest (France) in an engineer school (namely ENST de Bretagne, a French engineer school on telecommunications, sister-school of ENST ParisTech), where, as a professor, I created and managed the "computer science and engineering" department.

In 1984, I moved back to the university of Rennes where, since then, I have been a professor in informatics. At IRISA (CNRS-INRIA-University joint computing research laboratory located in Rennes), I founded a research group on Distributed Algorithms in 1984 (one of the very first groups on this topic in Europe at that time). Moreover, I had a consulting position at CNET (national research center of Trance-Telecom) during the period 1983-1986.

My research interests includes distributed algorithms, distributed computing systems, distributed computability and dependability. My main interest lies in the fundamental principles that underlie the design and the construction of distributed computing systems. I have been Principal Investigator of many research grants in these areas (founded by the European community, private companies -such as Alcatel, GEC-Alsthom and France-Telecom-, or the French government). I have also obtained grants from bi-national research programmes between France and other countries such as Brazil, Hong-Kong, Israel, Italy, Japan, Mexico, Portugal, and USA (Santa Barbara, Georgia Tech, Kansas State U.). I have been invited by more than 30 universities all over the world (Europe, North and South America, Africa, and Asia) to give lectures on distributed algorithms and distributed computing.

Up to now, I published 159 papers in journals. These journals cover both theory and practice. Among them, there are the following prestigious journals: the Journal of the ACM, Algorithmica, SIAM Journal of Computing, Acta Informatica, Distributed Computing, The Communications of the ACM, Information and Computation, Journal of Computer and System Sciences, JPDC, IEEE Transactions on Computers, IEEE Transactions on Software Engineering, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on TPDS, IEEE Computer, IEEE Software, Journal of Supercomputing, IPL, PPL, Theoretical Computer Science, Theory of Computing Systems, Real-Time Systems Journal, The Computer Journal, etc. I have also published 333 papers in conferences (ACM STOC, ACM PODC, ACM SPAA, IEEE ICDCS, IEEE DSN, DISC, COCOON, IEEE IPDPS, ICDCN, OPODIS, Europar, FST&TCS, IEEE SRDS, etc.), and written eleven books devoted to parallelism, distributed algorithms and systems (published by the MIT Press, Wiley & Sons, Morgan & Claypool, and Springer). I have been an invited speaker in more than 31 international conferences (including the prestigious DISC, IEEE ICDCS, SIROCCO, EUROPAR, ICDCN, IEEE NCA, and OPODIS conferences). Among my publications, 437 are listed when querying DBLP. My current *h-index* is 55 (as computed by Google Scholar).

I currently serve in the editorial board of three international journals. I served in program committees for more than 160 international conferences (including ACM PODC, DISC, ICDCS, IPDPS, DSN, LADC, SRDS, SIROCCO, ICDCN, SSS, NETYS, OPODIS, etc.) and chaired the program committee of more than 20 international top conferences (including DISC -twice-, ICDCS, SIROCCO, ICDCN, OPODIS, and NETYS). I received eight best paper Awards in international top conferences (IEEE ICDCS three times in a row 1999, 2000, and 2001, SSS in 2009 and 2011, Europar in 2010, DISC in 2010, PODC in 2014). Recently, I chaired ICDCN 2013 (devoted to distributed computing and networked systems, LNCS 7730) and NETYS 2014 (devoted to networked systems, LNCS 8593). I also

recently wrote two books (500 pages each) one on synchronization and the other one on distributed computing, both published by Springer in 2013.

I served as the chair of the steering committee leading the DISC symposium series in 2002-2004, I have been a member of the steering committees of ACM PODC (ACM Symposium on the Principles of Distributed Computing) during the period 2005-2009, and I am a member of the steering committees of IEEE ICDCS (Int'l Conference on Distributed Computing and Systems), and ICDCN (Int'l Conference on Distributed Computing and Networks). Since 2006, I am the European representative in the IEEE technical committee on Distributed Computing. Since 2010, I am a senior member of the *Institut Universitaire de France*. In 2015, I was awarded the Prize "*Innovation in Distributed Computing*" (award ceremony during the SIROCCO 2015 conference), and was elected member of *Academia Europaea*.

3 A glimpse at a few figures

The following tables describe my publication activity and its impact.

Books	11
Chapters in books/encyclopedia	9
Papers in peer-reviewed Journals	159
Papers in peer-reviewed Conf. proceedings	333
Best paper awards (in top conferences)	8
Other (informal or short) publications	39
Invited Papers (Int'l Conf + workshops)	31
Supervised PhD	38
Co-supervised PhD	10
Invited Courses	45
PC Member	> 180
PC Chair and Proceedings Editor	> 25
PhD Committees	> 190
Nb of co-authors (as cited by DBLP)	170

Impact factors (October 2016)	
h-index Google scholar	55
i-10 index Google scholar	254
Nb citations Google scholar	10976
Articles cited by DBLP	>437

Among my 333 articles in conferences	
Published by ACM (not counting short papers)	33
Published by IEEE	126
Published by Springer in LNCS	115
Published by North Holland	11
PODC papers regular, short	16, 20
DISC papers regular, short	19, 5
ICDCS papers	21
SPAA papers	6
SIROCCO papers	14
OPODIS papers	15
SRDS and DSN papers	20

Among my 159 articles in journals	
IEEE Transactions in Parallel and Dist. Systems	14
IEEE Other Transactions (TC, TSE, TKDE, TDCS)	12
Distributed Computing	9
Journal of Parallel and Distributed Computing	11
Theoretical Computer Science (TCS)	12
Information Processing Letters	16
Parallel Processing Letters	8
JACM, SIAM JC, Algorithmica, JCSS, Springer ToCS Acta Informatica, Information & Computation	17
The Computer Journal	4
Magazines: IEEE Computer, IEEE Software, CACM	5
Articles in French Journals	18
Articles in Asian Journals	3

4 My view

4.1 What is research? What is teaching? A personal view

Our job (professor) is how to combine research and teaching activities. This section presents personal views (that consequently are both partial and questionable). The style is voluntarily informal and I am conscious that the way this view is exposed is a little bit schematic or even provocative.

Research   To me "research" is an *adventure, both personal and collective, of intellectual nature* (it is not a joint venture ...). We are working in a scientific domain (basically, "informatics" can be abstracted as the science of operations), and our job is to set and answer questions (specifically, given a set of operations, what can be computed, and -if any- which is the best solution). More generally, our job is to think -within our scientific domain- for the long run[2]. (I basically share the point of view expressed by Odeh Goldreich in his essai "On our duties as scientists"[3].) For us, application domains are more important because they ask for new solutions, than for their today economical value. We never have to forget that "it is not by improving the candle technology that electrical lamps have been discovered, understood and mastered".

Teaching   For Henri Lebesgue (1875-1941) "teaching" was the activity of "penser à haute voix devant les étudiants" (to teach is to think in a loud voice in front of students"). It is not a quiz exercise. I share this view. Of course, new technologies (e.g. embedded in a new programming language) have to be taught, but ultimately, a pupil does not learn how to write in reading explanatory leaflets of washing machines, but in reading great authors from the literature. This means that our lectures have to provide the students with (1) enough food for their brain in order they be able to address and correctly solve the problems they will encounter, and (2) enough background knowledge and insight in order they still have a job in twenty years! To quote Lamport: "Teaching is not an accumulation of facts"[4].

Students are our "products", and, due to what they learned, each generation of students gives rise to a new way of thinking when they are going to work in a company, each generation entailing its "small revolution" in the software industry. That is our main impact on the society. Each new student generation makes the industry moves to better knowledge and better practices. That is why teaching is fundamental. And the teaching activity is difficult because we have to teach in a way as simple as possible, and simplicity is very difficult to reach (as Blaise Pascal wrote "I am sorry for having written such a long letter, I had not enough time to write a shorter one", and Albert Einstein wrote "Make it as simple as possible, but not simpler"). This motivated me to write books, and a great lot of survey papers on emerging topics.

4.2 My view of informatics and distributed computing

Informatics can be defined as the meeting point between mathematics and technology[5]. Roughly speak-

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[2]To better understand a part of the the duality researcher/engineer, I sometimes parallel it with the duality historian/journalist. The job of a historian is to analyze and relate events in time, in order to provide us with a continuous, consistent and global view of things that have happened. Differently, the job of a journalist is to relate (and sometimes analyze) the last events that occurred. Similarly to a historian, the job of a professor is to work and investigate scientific domains in order to provide the students with a deep and global view of these domains. Obtaining a view of a domain that allows to provide students with a deep scientific background requires a strong involvement in research. As for a journalist who, differently from a historian, works with "today" facts/inputs, the job of an engineer (differently from a theory researcher) depends highly on the current (perishable) technology. Of course, this view is a little bit schematic, but nevertheless captures a difference in two extreme behaviors encountered in the scientific and engineering communities working in informatics.

[3]http://www.wisdom.weizmann.ac.il/ oded/on-duties.html.

[4]In "Teaching concurrency", *ACM Sigact NEWS*, 40(1):58-62, 2009.

[5]In some sense, we could say that "Informatics is the language of technology".

ing, its two components, *computing science* and *computing engineering*, can be seen as complementary facets: computing science is to understand, computer engineering is to build. Said in other words, we are concerned with a science of *abstraction*, namely, creating the right model for a problem and devising the appropriate mechanizable techniques to solve it. This is specifically true in (fault-tolerant/dynamic/large-scale/etc.) distributed computing where finding models that are realistic while remaining abstract enough to be tractable, was, is, and still remains a real challenge.

Distributed computing was born in the late seventies when people started taking into account the intrinsic characteristics of physically distributed systems. The field then emerged as a specialized research area distinct from networks, operating systems and parallelism. Its birth certificate is usually considered as the publication in 1978 of Lamport's most celebrated paper "*Time, clocks and the ordering of events in a distributed system*". Since then, several high level journals and (mainly ACM and IEEE) conferences are devoted to distributed computing.

Distributed computing arises when one has to solve a problem in terms of entities (usually called processes, agents, sensors, peers, actors, processors, nodes, etc.) such that each entity has only a partial knowledge of the many parameters involved in the problem that has to be solved. While parallelism and real-time can be characterized by the words *efficiency* and *on time computing*, respectively, distributed computing can be characterized by the word *uncertainty*. This uncertainty is created by asynchrony, failures, unstable behaviors, non-monotonicity, system dynamism, mobility, low computing capability, scalability requirements, etc. Mastering one form or another of uncertainty is pervasive in all distributed computing problems[6]. Finally, as the aim of a theory is to codify knowledge in order it can be transmitted (to students, engineers, practitioners, etc), research in distributed computing theory is fundamental. When something works we must know why it works, and when something does not work ... we must know why it does not work.

4.3 Why research in distributed computing is fundamental

Looking to the past to appreciate the future   One of the main problems in the fifties, sixties and even seventies, was to produce efficient programs. It appears that to attain this goal, researchers have spent lots of efforts in establishing strong results in algorithms and formal languages. The benefit is obvious. The results in algorithms and formal languages allowed us to replace tricks by scientific solutions based on systematic approaches. Now, thanks to their lectures on formal languages and algorithms students know what can be done, what cannot be done, and what can be done efficiently.

The same analysis holds for lock-based concurrency. The problem of mastering multiprogramming was addressed in the late sixties and early seventies. Thanks to the work of Brinch Hansen, Dijkstra and Hoare (among others), basic concepts to master lock-based synchronization were developed (e.g., semaphores and monitors) and an associated methodology based on invariants was developed[7]. Thanks to these results, students know how to manage and cope with multithreaded computing, and how to analyze multiprocess programs in failure-free environments.

Today, it is an obvious fact that languages and synchronization are useful, and, due to lots of associated results (e.g., the fact that the classes of deterministic FSA and the class of non-deterministic FSA are equivalent), that they are among the elements that set up informatics as a science[8]. We cannot imagine mastering object-oriented programming or software engineering without relying on the scientific background accumulated in language theory, synchronization and other basic domains. The actual advances in software engineering is (partially) an implicit output of these early results.

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[6]A foundational paper of distributed computing is the celebrated paper "*Impossibility of distributed consensus with one faulty process*" by Fischer M.J., Lynch N.A., and Paterson M.S., published in the Journal of the ACM, 32(2):374-382, 1985. This paper established the domain on sane foundations.

[7]"The origin of concurrent programming", Springer-Verlag, 534 pages (2002), Edited by P. Brinch Hansen.

[8]I have considered here only two domains (languages and synchronization). Of course, this list is not exhaustive. I could have taken similar examples in other domains such as databases, computability, algorithms, etc.

The moral of the story is that we have to do *today* research in the basics of distributed computing if we want to be able to master *future* applications, to known what can be done, what cannot be done, what can be done efficiently, etc., despite physical program distribution, asynchrony, failures, mobility, dynamism, unstable behavior, scalability requirements, etc. We have to go from tricks to a scientific knowledge that can be transmitted to, and exploited by, engineers.

Why DC is fundamental The computational universe surrounding us today is clearly very different from that envisioned by designers forty years ago. Even the most futuristic visions of that time of supercomputing and parallel machines (which have guided the research and absorbed a consequent part of the research funding) are far from today's computational realities. More specifically, computing devices are conquering the world. They are spreading out everywhere (and we could now nearly say that a high speed train or a plane is a sophisticated local area network with "additional devices").

The today computing applications are characterized by networked entities communicating with each other, cooperating towards common tasks or the solution to a shared problem, and acting partially in an autonomous way. Said, differently, the computational world is inherently *distributed*. So, mastering information science and information technology in the future goes through mastering distributed computing.

5 International recognition

An international "ranking"
A distributed computing-oriented article titled "The Theoretic Center of Computer Science" that appeared in the December 2007 issue of *ACM Sigact News* (Vol. 38, No. 4) ranks my name in the top 10 of the most *central* authors of the *Principles of Distributed Computing* area, in its "all-time" ranking.

Impact factors
▷ 2015: elected member of *Academia Europaea*.
▷ 2015 SIROCCO Prize for Innovation in Distributed Computing
▷ h-index : 55 (Google Scholar), i10 index : 254 (Google Scholar).
▷ Number of citations: 10976 (Google Scholar).
▷ Best paper awards in top conferences: 8 (3 ICDCS, DISC, 2 SSS, Europar, PODC).
▷ Author of 11 books (8 in English, 3 in French) and 488 refereed articles (journal and conferences).
▷ Number of co-authors (as counted by DBLP): 170.

At the national level
▷ "Senior member" of the *Institut Universitaire de France*.
▷ Member of the Scientific Board of the Computing Science Institute (INS2I) of the French CNRS (national research center): 2011-2015.
▷ Member of the Executive Board and the Scientific Board of the SIF: *Société Informatique de France* (French Computing Science Society) since 2013.

Member of the editorial board of the following journals
▷ IEEE Transactions on Parallel and Distributed Systems (2006-2011).
▷ IEEE Transactions on Computers (2010-2015).
▷ Journal of Parallel and Distributed Computing (since 2005).
▷ Journal of Computer Systems Science and Engineering (since 1998).
▷ Foundations of Computing and Decision Sciences (since 1995).

Professorship positions at PolyU
▷ *Adjunct* Professor (2013-2016), Polytechnic University (PolyU), Hong Kong.
▷ *Distinguished Chair* Professor in Distributed Algorithms (2017-2020), Polytechnic University (PolyU), Hong Kong.

IEEE TC on distributed computing
▷ European representative in the IEEE technical committee on Distributed Computing.

Birthday celebration
▷ The distributed computing community has celebrated my 60th birthday with a symposium that was part the international conference DISC 2009, which was held in Spain, september 2009. (The corresponding articles are recorded in the DISC'09 proceedings, Springer LNCS 5805, pages 3-5.)
▷ Locally, my University department organized a Colloquium to celebrate my 60th birtday in May 2009. Among others, the invited speakers included Leslie Lamport (triple winner of the Dijkstra award, and Turing Award 2013), Maurice Herlihy (winner of the Dijkstra award and the Godel Award), and Rachid Guerraoui (European ERC Grant Laureate).

"Innovation in Distributed Computing" award
▷ Winner of the 2015 "Innovation in Distributed Computing" award (also called SIROCCO award) that I will formally receive at the 2015 SIROCCO conference. I am awarded this prize in distributed computing for my work on the condition-based approach to solve the consensus problem, and my work on message communication patterns related to message causal ordering and distributed checkpointing.
▷ The Prize for "Innovation in Distributed Computing" is an award presented annually at the *International Colloquium on Structural Information and Communication Complexity* (SIROCCO) to an individual who have made a major contribution to understanding "the relationships between information and efficiency in decentralized computing", which is the main area of interest for this conference, whose typical topics are distributed computing, communication networks, game theory, parallel computing, social networks, mobile computing, autonomous robots, peer to peer systems, and communication complexity. The SIROCCO proceedings are published by Springer in its LNCS series.
▷ As expressed in the call for nominations, the aim of this award is *to recognize inventors of new ideas that were unorthodox and outside the mainstream at the time of their introduction.* To be eligible for this award: (1) The original contribution must have appeared in a publication at least five years before the year of the award, and (2) one of the articles related to this contribution must have appeared in the proceedings of SIROCCO. The award was presented for the first time in 2009. The previous winners are (in chronological order) Nicola Santoro, David Peleg, Jean-Claude Bermond, Roger Wattenhofer, Andrzej Pelc, and Pierre Fraigniaud.

Informatics Europe
▷ The *Informatics Europe* society asked me to chair its first *Best Currriculum Pratice Award*, which was devoted to "Parallelism and Concurrency" (2011). The award was 30K Euros funded by Intel Co.

Steering committee member
▷ ACM PODC and DISC are considered as the top conferences specialized in the theory and the principles of distributed computing. IEEE ICDCS is considered as one the best from a more applied point of view.

- Vice-chair (2000-2002) and then chair (2002-2004) of the steering committee of DISC (Symposium on DIStributed Computing).

  During my chairing period, DISC became an EATCS symposium (European Association for Theoretical Computer Science). Moreover, with Alex Shvartsman –UCONN MIT– (who was then the

DISC SC vice-chair), we started discussions with ACM, in order that the Dijkstra prize becomes a prize jointly awarded by both DISC and PODC. We succeeded and the Dijkstra prize ceremony now alternates between PODC and DISC.

- Member of the steering committee of SIROCCO (Colloquium on Structural InfoRmatiOn and Communication COmplexity)[9]: 2005-2008.

- ACM PODC (Symposium on Principles of Distributed Computing): "member at large" for a three year term, elected during the plenary meeting at PODC 2006.

▷ Currently member of the SC of:

- IEEE ICDCS (Int'l Conference on Distributed Computing Systems), SC member since 2006 (I was the conference chair of ICDCS 2006).

- ICDCN (Int'l Conference on Distributed Computing and Networking), since 2004. ICDCN is becoming a premier distributed computing venue in Asia.

- NETYS (Int'l Conference on Networked systems), since 2013. NETYS is a new conference whose aim is to become a premier distributed computing venue in Africa.

PhD committees

▷ Since 1980, I have been a member of more than 200 PhD committees (mainly in France).
▷ Numerous PhD committees in France: Amiens, Besançon, Bordeaux, Brest, Caen, Grenoble, Lille, Montpellier, Nancy, Orléans, Paris 5, Paris 6, Paris 7, Paris 11, Rennes, Toulouse.
▷ I have been an external examiner for PhD in the following countries: Algeria (Alger, Oran), UK (Newcastle upon Tyne: 1995, 2005, Cambridge 2006), Australia (Australian National University, Canberra, 1996), Belgium, Cameroun (Université de Yaoundé), Canada (Concordia University 1996 et 2000, Université de Montréal), Spain (Madrid, 2004), Ireland (Trinity College, 1996), Italy (Rome, 1998, 2006, 2011), Norway (Tromsoe University), Netherlands, Portugal (INESC 1996, Universidade de Lisboa 2014), Switzerland (EPFL, 1992, 1995, 2005), Tunisia (ENSI, Tunis, 1999), and USA (Atlanta Georgia Tech 1999, Kansas State University, University of Texas at Austin, 1996), University of Puebla (Mexico, 2009), Germany (Technical University of Berlin, 2015), Morocco (ENSIAS Rabat, 2015), Poznań University (Poland, 2017).

International expertise

Since more than 20 years, I have written many reviews for projects submitted to the European community, NSF (USA), FCAR (Québec, Canada), IAS (Australian Institute for Advanced Research), VR (Swedish Research Council), the funding research agency of Austria, the Natural Sciences and Engineering Research Council of Canada (NSERC), and CONICYT (Chili).

Recognition of foreign researchers by my university

▷ I nominated Leslie Lamport (Microsoft, 2003), David Harel (Weizmann Institute of Science, Israel, 2005), and Gregor von Bochmann (University of Ottawa, 2012), who received the "Doctor Honoris Causa" title from my University.

International collaboration

▷ I have co-authored articles with 170 co-authors (as cited by DBLP) all over the World. Those include:

- Israel: Yehuda Afek (Tel Aviv university), Roy Friedman, Yoram Moses, Shmuel Zaks (The Technion, Haifa, Israel), Gadi Taubenfeld (Herzliya).

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[9]The proceedings of both DISC and SIROCCO are published in the Springer LNCS series.

- Europe: Ozalp Babaoğlu (Universitá di Bologna, Italy), Roberto Baldoni and Francisco Quaglia (Universitá La Sapienza, Roma, Italy), Jerzy Brezinsky (University of Poznan, Poland), Paul Ezilchelvan (University of Newcastle, UK), Antonio Fernandez (University del Rey Juan Carlos, Madrid, Spain), Cristof Fetzer (Dresden University, Germany), José Ramon Gonzalez de Mendivil (University of Pamplona, Spain), Rachid Guerraoui and André Schiper (EPFL, Switzerland), Mikel Larrea (University of the Basque Country, Spain), Luis Rodrigues and Paulo Verìssimo (Lisbon, Portugal),

- US and Canada: Divy Agrawal and Amr El Abbadi (Santa Barbara), Mustaque Ahamad (Georgia Tech), Ajoy Datta (University of Las Vegas), Vijay Garg (Austin, TX), Eli Gafni (UCLA), Ajay Ksemkalyani (University of Chicago), Masaaki Mizuno (Kansas State University), Gil Neiger (Intel, Portland, Oregon), Rob Netzer (when he was at Brown university), Maurice Herlihy (Brown University), Ravi Prakash (University of TX, Richardson), Mukesh Singhal (Kentucky university), Sam Toueg (University of Toronto), K. Vidyasankar (University of Newfoundland, Canada).

- Latin and South America: Sergio Rajsbaum and Armando Castañeda (UNAM Mexico), Fabiola Greve and Raimundo Macedo (Federal university of Salvador de Bahia, Brazil), Francisco Brasileiro (Campina Grande, Brazil).

- Asia: Makoto Takizawa (Tokyo Denki University), Yoshifumi Manabe (NTT, Tokyo), Jiannong Cao (Hong-Kong Polytechnic University), Weigang Wu (Sun Yat-Sen University, Guangzhou, China), Weiping Zhu (Wuhan University, China).

▷ I obtained with most of the previous researchers bi-national grants which allowed us to visit each other and produce new results. The corresponding countries are Israel, USA (NSF agreement with CNRS or INRIA), Italy, Portugal, Brazil, Mexico, Japan and Hong-Kong.

Invited talks/keynote speeches since 2000

▷ 6th Int'l Conference EUROPAR, Munich, 2000. *Logical instantaneity and causal order*: Springer LNCS 1900, pp. 13-20. Europar is considered as the first European venue for parallelism.

▷ 6th Int'l Workshop on Distributed Computing (this IWDC workshop is now the ICDCN conference), Kolkata (India), 2004: *The notion of veto number for distributed agreement problems*. Springer LNCS 3326, pp. 315-325.

▷ Int'l workshop on Dynamic Distributed Systems (satellite workshop of IEEE ICDCS), Lisbon, 2006: *From static distributed systems to dynamic systems*.

▷ 10th Int'l Conference on Principles of Distributed Systems, Bordeaux, 2006 (OPODIS'06). *In search of the holy grail: looking for the weakest failure detector for wait-free set agreement*: Springer LNCS 4305, pp. 1-17. (The other invited speakers were Amir Pnueli and Butler Lampson, both winner of the Turing award).

▷ 6th Int'l IEEE Symposium on Network Computing and Applications, Boston, 2006 (NCA'06). *Eventual leader service in unreliable asynchronous systems: why? How?* IEEE Computer Press, pp. 11-21.

▷ 21th Int'l Symposium on Distributed Computing, Cyprus, 2007 (DISC'07): *A subjective visit to selected topics in distributed computing*, Springer LNCS 4731, pp. 5-6. (The other invited speaker was David Peleg from the Weizmann Institute).

▷ 22th Int'l IEEE Conference on Advanced Information Networking and Applications (AINA'08), Okinawa, Japan, 2008: *Synchronization is coming back, but is it the same?* IEEE Computer Press, pp. 1-10.

▷ Workshop on Theoretical Aspects of Dynamic Distributed Systems (TADDS'09) in conjunction with DISC 2009. Elche (Spain), 2009: *How to implement a shared memory in a dynamic system? Which are the constraints?*

▷ Talk on distributed computability titled "From Turing to the clouds" given at the "Alan Turing Year" conference, University of Mexico, November 2012.

▷ *A look at distributed recursion*. Talk given at the LADA (Languages for Distributed Algorithms)

Workshop, Satellite workshop of 33th ACM POPL (Principles of Programming Languages) conference, 2012.

▷ *Concurrency-related distributed recursion*. Talk given at the 15th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'13), Springer LNCS 8255, 2013.

▷ *What can be computed in a distributed system?* Talk given at the Workshop "From Programs to Systems: The Systems Perspective in Computing" in honor of Turing Award Winner Professor Joseph Sifakis, Springer LNCS 8415, 2014.

▷ *From Turing to the clouds (on the computability power of distributed systems)*. Talk given at the 21th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'14), LNCS 8576, pp. xiii-xiv, 2014.

▷ *Concurrent systems: hybrid object implementations and abortable objects..* Invited talk. 21th Int'l European Parallel Computing Conference (EUROPAR'15), Springer LNCS 9233, pp. 3-15, 2015.

▷ *Communication patterns and input patterns in distributed computing*. Invited talk. 22th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'15), Springer LNCS 9439, pp. 1-15, 2015.

▷ *A look at basics of distributed computing*. Invited tutorial. Proc. 36th IEEE Int'l Conference on Distributed Computing (ICDCS'16), IEEE Press, pp. 2-11, 2016.

▷ *Theory and practice of dependability for message-passing distributed systems: the case of Byzantine failures*. 7th Latin-American Symposium on Dependable Computing (LADC 2016). Cali (Colombia).

▷ *t-Resilient Immediate Snapshot is Impossible*. Banff International Research, (On Invitation) Workshop 16w152 on "Complexity and Analysis of Distributed Algorithms" (November 2016).

6   Scientific management activities

Reviewer for journals and books

▷ I regularly review papers submitted to international journals. These journals include: Journal of the ACM (JACM), Information and Computation, Distributed Computing, ACM Transactions on Computer Systems (ACM TOCS), ACM Transactions on Programming Languages and Systems (ACM TOPLAS), ACM Transactions on Database Systems (ACM TODS), Journal of Algorithms, Journal of Systems and Software (JSS), Journal of Computer and System Science (JCSS), Information Processing Letters (IPL), Parallel Processing Letters (PPL), IEEE Transactions on Computers (IEEE TC), IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS), IEEE Transactions on Knowledge and Data Engineering (IEEE TKDE), IEEE Transactions on Software Engineering (IEEE TSE), IEEE Transactions on Dependable and Secure Computing (IEEE TDSC), Science of Computer Programming (SCP), Theoretical Computer Science (TCS), Theory of Computing Systems (TCS), The Computer Journal.

▷ I am regularly asked to review book proposals by Wiley & Sons, Springer, and Kluwer Academic Press.

Recommendation letters

▷ I have written lots of recommendation letters (more than 60) for Green Card (USA), tenure position or promotion to the rank of full professor. USA, UK, Canada, China, Germany and Israel are a subset of the corresponding countries for the professor positions.

▷ I am regularly solicited to write recommendation letters to support applications to ACM or IEEE Fellowship. I have also written support letters for applications to the Turing award. I was a member of the Dijkstra Award in 2005. ▷ Member of the committee for selection of the *Principles of Distributed Computing Dissertation Award* (2017).

This award was created in 2012 by the PODC (ACM) and DISC (EATCS) conferences community to acknowledge and promote outstanding research by doctoral (Ph.D.) students on the principles of Distributed Computing.

Book prefaces

I have been recently asked by book authors to write a preface for their books. This concerns the book "Elements of Distributed Computing" by Vijay Garg (UT Austin), published by Wiley & Sons (2004), and the book "Do-All Computing in Distributed Systems: Cooperation in the Presence of Adversity" by Chryssis Georgiou (University of Cyprus) and Alex Shvartsman (MIT and University of Connecticut), published by Springer (2008).

PC chair, PC member, organizing committee member of the int'l conferences PODC, DISC, ICDCS, SIROCCO, and NETYS

▷ ACM PODC: PC member 2001, 2004, 2006, 2013, 2014, 2015.
SC member during 2006-2009.
I have been sollicited several times to chair the PC of PODC (2005, 2012, and 2015) but I had to decline due to health problems.

▷ The workshop on Distributed Algorithm (WDAG) became the int'l symposium on Distributed Computing (DISC) in 1996. PODC and DISC are recognized as the top conferences in the theory of distributed computing. Thanks to Jan van Leuween, I was involved in WDAG-DISC since its second edition, 1987. Since then, in one way or another, I spent lot of time and energy to have DISC a world leader conference.
PC chair: 1989 (Springer LNCS 312), 1995 (Springer LNCS 972).
PC member: 1987, 1990, 1993, 1996, 2006, 2008, 2013.
SC member: 2000-2004. SC Chair: 2002-2004.

▷ IEEE ICDCS. The IEEE Int'l Conference on Distributed Computing Systems was created in 1981. I have been involved in ICDCS since the very beginning (as one of my very first papers was at the first ICDCS).
PC member: 1990, 1993, 1995, 1998, 2000, 2004, 2007, 2009.
Chair of the track "Distributed Algorithms and Methods": 1994.
Chair of the track "Distributed Synchronization": 1999.
Chair of the track "Formal models and theory": 2005.
Chair of the track "Theoretical foundations": 2008.
Program chair: 2002.   Conference chair: 2006.   Workshop co-chair: 2002, 2010.
Int'l liaison chair: 2003, 2009, 2013. Award committee chair: 2004. Tutorial chair: 2010.

▷ SIROCCO. This conference is on complexity and the interplay between communication and computation. Its proceedings are published in the Springer LNCS series.
PC co-chair (with Andrzej Pelc): 2005. PC member: 2007.
Guest co-editor (with Andrzej Pelc and David Peleg) of a special issue of TCS (Theoretical Computer Science) devoted to Communication Complexity (Vol. 384, 2007). This issue includes the revised and improved versions of the best papers of SIROCCO 2005.

▷ NETYS. This is a new conference on Networked Systems. Its proceedings are published in the Springer LNCS series. PC member in 2013, 2015, 2016, and 2017. Program chair in 2014.

Other conferences   I have been involved in more than 180 program committees of int'l conferences, workshops, summer/winter schools. Here only a subset of them is listed.
▷ ICDCN (Int'l Conf. on Distributed Computing and Networking). PC member: 2005, 2008. PC chair: 2013. A special issue os TCS devoted to ICDCN 2013 will be published in 2015.
▷ IEEE DSN (Int'l Conf. on Dependable Systems and Networks). PC : 2000, 2001, 2002, 2004.

▷ IEEE SRDS (Symposium on Reliable Distributed Systems). PC: 1996, 1998, 2001, 2002, 2003, 2005. Award chair: 2014.

▷ OPODIS (Int'l Symposium on Principles of Distributed Systems). PC 2006 and 2015. Program chair: 2009.

▷ IEEE FTDCS (Int'l workshop on Future Trends of Distributed Computing Systems). PC: 1995. Program Chair: 1995, 2003.

▷ IEEE SPDP (Symposium on Parallel and Distributed Systems). PC: 1993, 1995.

▷ IEEE IPDPS satellite workshop on Fault-tolerance in Parallel and Distributed Systems. PC: 1996, 1997, 1999, 2000, 2002, 2004.

▷ IEEE ICA3P2 (Int'l Conference on Algorithms and Architecture for Parallel Processing). PC: 1995, 1997, 2002, 2007.

▷ IEEE ISORC (Int'l Symposium on Object-oriented Real-time Distributed Computing). Conference chair: 2002. Program chair: 1999. PC: 2003, 2006.

▷ IEEE PRDC (Pacific Rim Dependable Computing). PC: 2002, 2004, 2006. Int'l liaison chair: 2005.

▷ IEEE NCA (Int'l Symposium. on Network Computing and Applications). PC: 2001, 2003, 2004, 2006.

▷ PaCT (Int'l Conference on Parallel Computing Technologies). PC: 2001, 2003, 2005, 2007, 2009. (This conference is organized in Russia every two years.)

▷ EUROPAR (European Conference on Parallelism). PC: 1999, 2001.

▷ LADC (Latin-American Conference on Dependable Computing). PC: 2004, 2005, 2009.

▷ IEEE AINA (Int'l Conference on Advanced Information Networking and Applications). PC: 2003, 2004, 2006. Int'l liaison co-chair: 2005.

▷ MFSC (Int'l Symposium on Mathematical Foundations of Computer Science), PC: 2009.

▷ COCOA Annual Int'l Conference on Combinatorial Optimization and Applications, PC: 2009.

7 Research grants in the recent past

7.1 European Marie Curie project TRANSFORM

This European project involved EPFL (Lausanne, Switzerland), TU Berlin (Germany), The Technion (Haifa, Israel), FORTH Heraklion (Greece), and IRISA (Rennes, France). It was founded in the context of the "Marie Curie" reserach projects of the 7th Framework Programme of the European Community.

Title Theoretical Foundations of Transactional Memory. Acronym: TRANSFORM.

Duration November 2009 - October 2013.

Amount Total: 2 000 000 Euros. For IRISA: 425 300 Euros.

Scientific content Major chip manufacturers have shifted their focus from trying to speed up individual processors into putting several processors on the same chip. They are now talking about potentially doubling efficiency on a $2x$ core, quadrupling on a $4x$ core and so forth. Yet multi-core is useless without concurrent programming. The constructors are now calling for a new software revolution: the concurrency revolution. This might look at first glance surprising for concurrency is almost as old as computing and tons of concurrent programming models and languages were invented. In fact, what the revolution is about is way more than concurrency alone: it is about concurrency for the masses.

The current parallel programming approach of employing locks is widely considered to be too difficult for any but a few experts. Therefore, a new paradigm of concurrent programming is needed to take advantage of the new regime of multicore computers. Transactional Memory (TM) is a new programming paradigm which is considered by most researchers as the future of parallel programming. Not surprisingly, a lot of work is being devoted to the implementation of TM systems, in hardware or solely

in software. What might be surprising is the little effort devoted so far to devising a sound theoretical framework to reason about the TM abstraction. To understand properly TM systems, as well as be able to assess them and improve them, a rigorous theoretical study of the approach, its challenges and its benefits is badly needed. This is the challenging research goal undertaken by this research project.

7.2   Project DISPLEXITY (French national research agency ANR)

National project involving the following labs: IRIF (Paris), Prof. Piere Fraigniaud), Labri (Bordeaux) Prof. Cyril Gavoille), and IRISA (me).

Title   Distributed Computing: complexity and computability. Acronym: DISPLEXITY.

Duration   January 2012 - June 2016.

Amount   Total: 733 500 Euros. For IRISA: 226 500 Euros.

Scientific content   Distributed computation keep raising new questions concerning computability and complexity. For instance, as far as fault-tolerant distributed computing is concerned, impossibility results do not depend on the computational power of the processes, demonstrating a form of undecidability which is significantly different from the one encountered in sequential computing. In the same way, as far as network computing is concerned, the impossibility of solving certain tasks locally does not depend on the computational power of the individual processes. The main goal of DISPLEXITY is to establish the scientific foundations for building up a consistent theory of computability and complexity for distributed computing. One difficulty to be faced by DISPLEXITY is to reconcile the different sub-communities corresponding to a variety of classes of distributed computing models. The current distributed computing community may indeed be viewed as two not necessarily disjoint sub-communities, one focusing on the impact of temporal issues, while the other focusing on the impact of spatial issues. The different working frameworks tackled by these two communities induce different objectives: computability is the main concern of the former, while complexity is the main concern of the latter. Within DISPLEXITY, the reconciliation between the two communities will be achieved by focusing on the same class of problems, those for which the distributed outputs are interpreted as a single binary output: yes or no. Those are known as the yes/no-problems. The strength of DISPLEXITY is to gather specialists of the two main streams of distributed computing. Hence, DISPLEXITY will take advantage of the experience gained over the last decade by both communities concerning the challenges to be faced when building up a complexity theory encompassing more than a fragment of the field. In order to reach its objectives, DISPLEXITY aims at achieving the following tasks:
- Formalizing yes/no-problems (decision problems) in the context of distributed computing. Such problems are expected to play an analogous role in the field of distributed computing as that played by decision problems in the context of sequential computing.
-Formalizing decision problems (yes/no-problems) in the context of distributed computing. Such problems are expected to play an analogous role in the field of distributed computing as that played by decision problems in the context of sequential computing. -Revisiting the various explicit (e.g., failure-detectors) or implicit (e.g., a priori information) notions of oracles used in the context of distributed computing allowing us to express them in terms of decidability/complexity classes based on oracles.
-Identifying the impact of non-determinism on complexity in distributed computing. In particular, DISPLEXITY aims at a better understanding of the apparent lack of impact of non-determinism in the context of fault-tolerant computing, to be contrasted with the apparent huge impact of non-determinism in the context of network computing. Also, it is foreseen that non-determinism will enable the comparison of complexity classes defined in the context of fault-tolerance with complexity classes defined in the context of network computing.

7.3 Franco-Hong Kong project CO2Dim

Binational Franco-Hong Kong project involving the Departement of computing of Polytechnic University, HK (Prof. Jianniong Cao), the Department of Informatics of the University of Franche-Comté, France, (Prof. Julien Bourgeois), and IRISA (me). Project founded by the RGC agency on the Hong Kong side and the ANR agency on the French side.

Title Coordination and Computation in distributed intelligent MEMS. Acronym: CO2Dim.

Duration March 2013 - August 2016.

Amount (French side) Total: 240 000 Euros. For IRISA: 65 000 Euros.

Scientific content Over the last decades, MEMS (MicroElectroMechanical Systems) research has focused on the engineering process, but future challenges will consist in adding embedded intelligence to MEMS systems to obtain distributed intelligent MEMS. One intrinsic characteristic of MEMS is their ability to be mass-produced. This, however, poses scalability problems because a significant number of MEMS can be placed in a small volume. Managing this scalability requires paradigm-shifts both in hardware and software parts. Furthermore, the need for actuated synchronization, programming, communication and mobility management raises new challenges in both control and programming. Finally, MEMS are prone to faulty behaviors as they are mechanical systems and they are issued from a batch fabrication process. A new programming paradigm which can meet these challenges is therefore needed. This project proposes to develop CO2Dim, which stands for Coordination and Computation in Distributed Intelligent MEMS. CO2DIM is a new programming language based on a joint development of programming and control capabilities so that actuated synchronization can easily be programmed and can scale up to millions of units.

7.4 Franco-German project DISCMAT

Binational Franco-German project involving the Departement of Mathematics of University of Bremen, Germany, (Prof. Dmitri Kozlov), the Department of Informatics of Telecom, Paris Tech (Prof. Petr Kuznetsov), and IRISA (me). Project founded by the DFG agency on the German side and the ANR agency on the French side.

Title Mathematical methods in distributed computing. Acronym: DISCMAT.

Duration November 2014 - January 2018.

Amount (French side) Total: 401 500 Euros. For IRISA: 209 000 Euros.

Scientific content The goal of this interdisciplinary project is to develop new mathematical tools in the analysis of distributed systems and to improve our understanding of complexity and computability bounds in distributed computing.

Practically all computing systems, from fire alarms to Internet-scale services, are nowadays *distributed*: they consist of a number of computing units performing independent computations and communicating with each other to synchronize their activities. Our dependence on performance and reliability of the distributed computing becomes more and more imminent. Therefore, understanding fundamentals of distributed computing is of crucial importance.

The main complication here is the existing immense diversity of distributed applications, models of distributed computations, and performance metrics, combined with the lack of mathematical tools to handle this complexity. Recently, an impressive attempt to address this challenge was made: a number of long-standing open questions in distributed computability were resolved using some of the most advanced branches of modern mathematics, including the elements of combinatorial and algebraic topology. These encompass proving impossibility of solving the fundamental problems of agreement, and

renaming. However, most of the existing applications of topology in distributed computing concern theoretical positive or negative results, i.e., proving that no solution to a given problem in a given model exists or proving the existence fact in a non-constructive way. With a few exceptions, there are no convincing examples of using advanced mathematical tools to design new efficient algorithms.

At a higher level, this proposal aims at better understanding of what can and what cannot be implemented in specific distributed environments. In particular, we intend to apply the power of modern mathematics in deriving new algorithms and tight lower bounds for distributed computing problems.

7.5 Project DESCARTES (French national research agency ANR)

National project involving the following labs: IRIF (Paris), Prof. Piere Fraigniaud), Labri (Bordeaux) Prof. Cyril Gavoille), and IRISA (me).

Title   Abstractions layers for distributed computing. Acronym: DESCARTES.

Duration   October 2016 - September 2020.

Amount   Total: 395 000 Euros. For IRISA: 115 000 Euros.

Scientific content   Despite the practical interests of reusable frameworks for implementing specific distributed services, many of these frameworks still lack solid theoretical bases, and only provide partial solutions for a narrow range of services. We argue that this is mainly due to the lack of a generic framework that is able to unify the large body of fundamental knowledge on distributed computation that has been acquired over the last 40 years. The DESCARTES project aims at bridging this gap, by developing a systematic model of distributed computation that organizes the functionalities of a distributed computing system into reusable modular constructs assembled via well-defined mechanisms that maintain sound theoretical guarantees on the resulting system. DESCARTES arises from the strong belief that distributed computing is now mature enough to resolve the tension between the social needs for distributed computing systems, and the lack of a fundamentally sound and systematic way to realize these systems.

8   Scientific achievements: 1984-2000

I list and comment here only a a subset of my previous works. A reference of the type [Rx] refers to a journal paper listed in Appendix E, while a reference of the type [Cy] refers to a paper that appeared in a conference and is listed in Appendix F.

Books   I consider that the books and the many surveys I have written (e.g., in journals [R31,R43,R47, R65, R68,R72,R85,R87] or conferences [C123,C149,C150,C164,C201,C229,C234]) are a part of my research contribution. Establishing new results is fundamental, but is only the front of the coin. The obverse of the coin consists in disseminating and transmitting them to the students and colleagues.

8.1   Early research

Very early research   My early work was on operating systems and abstract data types. Then, I started working of communication systems with Gregor von Bochmann [R5]. It is during this "warm up" research period that I became interested in distributed computing.

Failure-free distributed synchronization   My very first interest in distributed computing has been the mutual exclusion problem. I wrote a book on that topic and designed (with J.-M. Helary and N. Plouzeau) one of the very first algorithms for arbitrary networks [R11]. A few years later, I designed (with Helary and Mostefaoui) a very general token-based mutex algorithm in which the token moves on an abstract tree that can be dynamically modified by an adversary daemon [R22]. (Interestingly, each of the mutex algorithms that uses a token moving a tree corresponds to a particular behavior of the underlying daemon.)

In the same spirit, I designed an algorithm for the h out of k resource allocation problem [C30]. While working on that topic, I entered the domain of quorums, and (with M. Mizuno) I introduced a general method to define and compose quorums [C33]. I also investigated the notion of k-arbiter [R39] to address the h out of k resource allocation problem.

Detection of stable/unstable properties   My interest in the detection of stable properties started with my first PODC paper (1987) [C12] that presents a very general distributed detection algorithm for a large class of stable properties (properties on system global states). These properties are such that, once true, they remain true forever. Then, I addressed the case of algorithms targeted for specific stable properties, mainly distributed termination detection [C42] and distributed deadlock detection [R30].

Then, motivated by a project on distributed debugging, I started working on the detection of unstable properties. Here, the additional difficulty comes from the fact that such a property can be satisfied only intermittently. My main contributions to this topic are described in [R26,R28,R41,R48,C43,C46,C56,C66]. Among them, [R28] was one of the very first papers addressing properties defined on the many control flows present in a distributed execution, while [R41] introduced the notion of *inevitable global state* and defined an algorithm to detect them (such a state is a state that is seen by all the sequential observers of the corresponding distributed execution). Finally the work described in [R48] concerns the detection of conjunction of local predicates; it presents one of the most efficient algorithms proposed so far to detect on the fly such predicates.

Data consistency   Distributed computing involves distributed data. This part of my work has many facets. In [R51], Vijay Garg and I introduced the *normality* consistency condition. Its definition is based only on the local order of operations as perceived by each process and by each object. If each operation is on exactly one object, normality and linearizability[10] are the same. Differently, when operations span several objects, normality is weaker than linearizability.

I have also proposed several protocols to implements sequentially consistent memories [R74,C47,C54] and shown that sequential consistency can be seen as a for of lazy linerarizability [C148].

I also investigated (mainly with M. Ahamad from Georgia Tech) the notion of *timed consistency* for shared distributed objects. This work was published in the top conferences PODC and DISC [C97,C100] and in journals (e.g., [R71]).

8.2   Causality, checkpointing, virtual precedence and vector clocks

Causal order   An important part of my past work was on *causality* in message-passing systems and its applications. One of my early work on causality is a protocol to deliver messages according to the so-called *causal order*. This simple and elegant protocol (designed with A. Schiper and S. Toueg), that appeared in IPL [R17], is widely referenced and appears in several textbooks devoted to distributed computing.

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[10]Herlihy M.P. and Wing J.M., Linearizability: a Correctness Condition for Concurrent Objects. *ACM Transactions on Programming Languages and Systems*, 12(3):463-492, 1990.

Checkpointing Then, my interest in causality moved to the checkpointing problem, and more specifically to communication-induced checkpointing (CIC). This checkpointing technique allows the application messages to piggyback control information, but does not allow the use of additional control messages. In this context, We (I with mainly J.-M. Helary, A. Mostefaoui) produced several results, among which the following ones.

- An important theoretical question is "Given an arbitrary set of local checkpoints, do these local checkpoints belong to the same consistent global checkpoint?" While this question has been answered by Netzer and Xu in the particular context of message passing systems[11], we answered it in a very general asynchronous computational model that encompasses shared memory systems and various message passing systems with reliable or unreliable and point-to-point or multicast or broadcast communication. This result has been published in *Acta Informatica* [R45].

- A very general definition of global checkpoint consistency that appeared in *IEEE Transactions on Software Engineering* [R49].

- A communication-induced snapshot algorithm that appeared in *IEEE TPDS* [R53]. This algorithm is very general and can be instantiated in many ways. It shows that consistent global states can be determined without the help of additional control messages (differently from the well-known Chandy and Lamport's snapshot algorithm that uses additional control messages called *markers*).

- A family of algorithms that allows the processes to define independent local checkpoints in such a way that any local checkpoint is part of a consistent global checkpoint. This work appeared in *Distributed Computing* [R57].

- The impossibility to design scalar-based communication-induced checkpointing protocols that satisfy the Rollback-Dependency Trackability property. This work appeared in *Information processing Letters* [R61].

- A Characterization of the *Rollback-Dependency Trackability* property. This work appeared in *Information and Computation* [R62].

All this work participated in providing checkpointing with solid theoretical foundations.

Virtual precedence In [R70,C87], Hélary, Mostefaoui, and I introduced and investigated the concept of *virtual precedence*. The problem is the following. An interval of a sequential process is a sequence of consecutive events of this process. The set of intervals defined on a distributed computation defines an abstraction of this distributed computation, and the traditional causality relation on events induces a relation on the set of intervals. The question is then: "Is the interval-based abstraction associated with a distributed computation consistent?". To answer this question, this paper introduces the *Interval Consistency* (IC) condition. Intuitively, this condition states that an interval-based abstraction of a distributed computation is consistent if its precedence relation does not contradict the sequentiality of each process. Interestingly, the IC condition can be operationally characterized in terms of timestamps (whose values belong to a lattice). The paper uses this characterization to design a versatile protocol that, given intervals defined by a daemon whose behavior is unpredictable, breaks them (in a non trivial manner) in order to produce an abstraction satisfying the IC condition. (Among other problems, communication-induced checkpointing can benefit from IC.)

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[11]Netzer, R.H.B. and Xu, J., Necessary and Sufficient Conditions for Consistent Global Snapshots, *IEEE Transactions on Parallel and Distributed Systems*, 6(2):165-169, 1995.

Optimal implementation of vector clocks   The major parts of the previous protocols are based on vector clocks, whose size is equal to the number of processes. So, an important question is the following "Given a message m, which is the minimal subset of the entries of a vector clock that m has to piggyback in order to fully capture causality?" We answered this question by stating a necessary and sufficient condition, and showed how it can implemented. This is an important result as, for each message m, it states the minimal quantity of information m has to carry in order the vector clock system allows the processes to fully capture the causality relation [R57]. Moreover, we also designed the first (to our knowledge) distributed algorithm that computes on the fly the *transitive reduction* associated with the partial order defined by a distributed execution [R73,C144] (the transitive reduction captures exactly the minimal partial order associated with a distributed execution).

9   Main research contributions during the period 2000 - 2010

Since 15 years my research is mainly focused on algorithms for distributed agreement, with a recent incursion in distributed computability.

One of my first work in distributed agreement is a (co-authored) paper titled "From group communications to transactions in distributed systems" that appeared in a 1996 special issue of *Communications of the ACM* devoted to "group communication" [R36]. Then, I became interested in the consensus problem, its variants such as the k-set agreement, and the design of protocols implementing failure detectors.

9.1   Consensus

I designed several consensus algorithms in asynchronous message-passing systems or shared memory systems for the crash failure model [R54,R67,R69,R82,R83,R95,C110,C134] or the Byzantine failure model [R79,R89,R90].

More specifically, [C110] (DISC 1999) presents a very simple consensus algorithm that is generic in the sense that it can be instantiated with any failure detector of any failure detector class as defined by Chandra and Toueg[12]. This algorithm was the first failure detector-based consensus algorithm that uses quorums in an explicit way to ensure the agreement property. Interestingly, the pattern on which this algorithm is based is very similar to the *adopt/commit* pattern proposed by Gafni[13]. Many consensus algorithms proposed after ours, follows our pattern. Similarly, the leader-based consensus protocol described in [R67], that was one of the very first Omega-based protocol, is widely referenced in the literature.

I have been one of the very first researcher to investigate the situations where consensus can be solved in one communication step. The corresponding paper [C134] is also widely referenced. In the same spirit, a transformation from binary consensus to multi-valued consensus is presented in [R58].

Very recently, I have revisited (with Y. Moses) the simultaneous consensus problem [C228] and shown that it cannot benefit from the condition-based approach. "Simultaneous" means that the processes that decide have to decide during the very same round.

I have investigated the use of consensus to solve agreement problems such as total order multicast in overlapping groups [R60], atomic broadcast in crash/recovery systems whose aim is to implement quorum-based replication [R77], and how to save consensus executions when one has to implement atomic broadcast [C124].

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[12]Chandra T.D. and Toueg S., Unreliable Failure Detectors for Reliable Distributed Systems. *Journal of the ACM*, 43(2):225-267, 1996.

[13]Gafni E., Round-by-round Fault Detectors: Unifying Synchrony and Asynchrony. *Proc. 17th ACM Symposium on Principles of Distributed Computing (PODC'00)*, ACM Press, pp. 143-152, 1998.

9.2 Failure detectors

I have addressed several directions of research related to failure detectors.

Computing with failure detectors In [R59,R76] (with co-authors) I investigated the *Global Data Computation* problem (also known under the name *Interactive Consistency*[14]). It consists in providing each process with the same vector (with one entry per process) such that each entry is filled with the value supplied by the corresponding process if it has not crashed, and its value or $\perp$ otherwise. The paper [R76] presents an algorithm, based on a perfect failure detector, that requires the processes to execute at most $\min(f + 2, t + 1)$ rounds (where t is the model upper bound on the number of processes that can crash, and f the actual number of crashes). This showed that solving that problem in an asynchronous system enriched with a perfect failure detector is not more expensive than solving it in a synchronous system.

From one failure detector to another one With A. Mostefaoui, I introduced the notion of failure detectors with *limited scope accuracy* [C111,C121] (they are failure detectors whose scope is limited to a subset of $x \leq n$ processes). [R81] presents a necessary and sufficient condition that allows transforming a failure detector with a limited scope accuracy into its non-limited scope counterpart. This condition states that the scope x of the failure detector has to be greater than t (the upper bound on the number of processes that can crash).

Other failure detector transformations are described in [R56] and [R94]. This last JPDC paper presents a transformation that is quiescent (after some finite time, the transformation does not require message to be exchanged).

On the weakest failure detector classes [R97] shows that there is no one-shot agreement problem for which the failure detector class $\Diamond \mathcal{P}$ is the weakest that allows to solve it (the class $\Diamond \mathcal{P}$ is the class of *eventually perfect* failure detectors: after some finite time they do suspect only the processes that have crashed).

The papers [R103,C198] study classes of failure detectors whose power can be added. The aim is here to define an "arithmetic" of failure detector classes.

Implementing failure detectors Traditional implementations of failure detectors consider that the system satisfy additional synchrony assumptions. In [C160,R93] I proposed (with Mostefaoui and Mourgaya) a totally new approach to implement failure detectors. That approach relies on the pattern of messages exchanged by the processes. Basically, this novel assumption requires that there is one (or several) process(es) whose answers to queries are among the $n - t$ first answers received by the process that issued the query. I have then shown that this novel kind of assumption can be combined with timing assumptions associated with a subset of the channels [R92]. It is important to see that such an approach favors the assumption coverage.

In [R113] is presented a weak timing assumption that allows the construction of an eventual leader service (Omega) in an asynchronous shared memory system, while [C221] considers the case of a message-passing system. Unifying these two approaches is still an open problem.

9.3 The condition-based approach

The consensus problem is one of the most important problem in asynchronous systems prone to failures: it captures the difficulty of coordinating independent entities when these entities can fail. Each process

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[14]Pease L., Shostak R. and Lamport L., Reaching Agreement in Presence of Faults. *Journal of the ACM*, 27(2):228-234, 1980.

proposes a value, and all the non-faulty processes have to agree on the same value that has to be one of the proposed values. Unfortunately, despite its very simple formulation, there is no deterministic algorithm that can solve the consensus problem as soon as (even only) one process can crash. This is the famous FLP impossibility result[15]. Until 2000, mainly three approaches were proposed to circumvent this impossibility. One consists in looking for a non-deterministic solution: a process can draw random numbers[16]. Another consists in enriching the system with a failure detector of an appropriate class[12]. The last one, that concerns shared-memory systems, consists in enriching the system with operations stronger than the base read and write operations (e.g. a Compare&Swap() operation). This approach has given rise to the notion of consensus number and to Herlihy's hierarchy[17].

In 2000, with S. Rajsbaum and A. Mostefaoui (during a visit of Sergio R. at IRISA) we started a collaboration that proved to be very fruitful, namely we introduced a novel way of circumventing the FLP impossibility result. This new approach does not consist in enriching the underlying system, but in restricting the set of input vectors (such a restricted set defines a *condition*). The main challenge is then to characterize the largest conditions that allows solving consensus in presence of up to t process crashes. This is the problem solved in [R78]. Then, [R80] establishes a hierarchy of conditions and presents corresponding efficient algorithms.

While the result in [R78] establishes the frontier from which a condition allows solving consensus despite asynchrony and up to t process crashes, we showed in [R91] that a condition can allow expediting consensus in a synchronous system. Said differently, [R91] extends to synchronous systems the hierarchy of conditions, namely, a condition that allows solving consensus despite t crashes in an asynchronous system, allows solving consensus optimally (in two rounds) in a synchronous systems: decidability in asynchronous system can be converted in efficiency in a synchronous system.

In a very interesting way, we have shown that there is a very strong connection between error-correcting code and distributed agreement problems [R98] (intuitively, an input vector encodes a value that has to be decided by the processes). We have also investigated the combined power of conditions and failure detectors to solve agreement problems [R105].

Finally, with my PhD student F. Bonnet, I have recently extended the condition-based approach to address the k-set agreement problem [R110]. This provides us with a very general condition-based framework.

9.4 k-**Set agreement in synchronous/asynchronous systems**

The k-set agreement problem is a weakening of the consensus in the sense that up to k different values can be decided. I worked on this problem in failure prone synchronous and asynchronous systems.

Set agreement in synchronous systems   The main result in this type of systems is described in [R112], where the fault model is the general omission failure model. A new termination property is introduced. Let a *good* process be process that neither crashes nor commits receive omission failure. The new property, called *strong termination*, obliges the good processes to decide. A k-set algorithm is presented where every good process decides and halts by round $\min(\lfloor \frac{f}{k} \rfloor + 2, \lfloor \frac{t}{k} \rfloor + 1)$. This algorithm is clearly optimal.

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[15]Fischer M.J., Lynch N.A. and Paterson M.S., Impossibility of Distributed Consensus with One Faulty Process. *Journal of the ACM*, 32(2):374-382, 1985.

[16]Ben-Or M., Another Advantage of Free Choice: Completely Asynchronous Agreement Protocols. *Proc. 2nd ACM Symposium on Principles of Distributed Computing (PODC'83)*, pp. 27-30, 1983.
Rabin M., Randomized Byzantine Generals. *Proc. 24th IEEE Symposium on Foundations of Computer Science (FOCS'83)*, IEEE Computer Press, pp. 403-409, 1983.

[17]Herlihy M.P., Wait-Free Synchronization. *ACM Transactions on Programming Languages and Systems*, 13(1):124-149, 1991.

In addition to the strong termination property, (as far as I know) this algorithm is the only early-deciding and stopping k-set agreement algorithm proposed so far for the general omission failure. A survey of synchronous set agreement is presented in [201].

Set agreement in asynchronous systems Differently from synchronous systems, k-set agreement cannot be solved in asynchronous systems when $k \leq t$. As already indicated, [C121] investigates failure detectors with limited scope accuracy to solve k-set agreement, and presented several protocols. Differently, [C131] considers that the additional power is supplied by random numbers. [R105,C184] add the power of appropriate failure detector classes to conditions in order to solve k-set agreement. In the context of shared memory systems, the invited paper [C205] posed the problem of the weakest failure detector for solving the k-set agreement problem. At the rump session of PODC 2007, I posed the following conjecture at the rump session "$\overline{\Omega_k}$ *is the weakest failure detector for* $k-$*set agreement in shared memory systems*". This conjecture has been positively answered by three independent groups of researchers (PODC 2009). I am now working for the weakest failure detector for $k-$set agreement in message passing systems.

9.5   Distributed computability

I started becoming interested in distributed computability in 2006. I worked on this topic mainly with E. Gafni, S. Rajsbaum, and C. Travers (who, at that time, was one of my PhD students).

Committee decision and renaming My first (co-authored) contribution was the definition of the *committee decision* problem [C192] that was later generalized to the notion of *simultaneous consensus task* [C204].The question answered is the following: "What is the power of the task where processes are involved in k simultaneous consensus instances and each is required to decide in only one of them (several processes deciding possibly in different instances)?"

My second contribution is a wait-free k-Test&Set-based adaptive renaming algorithm [C200]. The paper shows that the new space name can be reduced from $2p-1$ (where p is the number of participating processes) to $2p - \lceil \frac{p}{k} \rceil$. This work encouraged us to investigate the relation linking Test&Set, adaptive agreement and set agreement. This investigation resulted in [C216,C223]. As Test&Set, adaptive agreement and set agreement are sub-consensus tasks (i.e., they are weaker than consensus), the holy grail is here to establish a hierarchy of subconsensus tasks (if any), similarly to the hierarchy of consensus tasks as defined by Herlihy[17]. This line of research is fundamental if we want to understand the power of base synchronization primitives. In some sense, the research agenda is here to establish the "Mendeleiev's table" of sub-consensus tasks. A very early step in that direction appears in [R106].

I also proposed and investigated (with G. Taubenfeld) the notion of *timed register* [C208]. A timed register generalizes the notion of an atomic register as follows: if a process invokes two consecutive operations on the same timed register which are a read followed by a write, then the write operation is executed only if it is invoked at most d time units after the read operation, where d is defined as part of the read operation. We show that a timed register is a universal object (i.e., an object from which any object defined by a sequential specification can be built despite asynchrony and failures)[17].

[C223] explores a new direction to solve the k-set agreement problem in a synchronous system of n processes. It considers that the system is enriched with base objects (denoted $[m, \ell]$_SA objects) that allow solving the ℓ-set agreement problem in a set of m processes ($m < n$). This work has several contributions. It first proposes a synchronous k-set agreement algorithm that benefits from such underlying base objects. This algorithm requires $O(\frac{t\ell}{mk})$ rounds, more precisely, $\lfloor \frac{t}{\Delta} \rfloor + 1$ rounds, where $\Delta = m\lfloor \frac{k}{\ell} \rfloor + (k \bmod \ell)$. It also shows that this bound, that involves all the parameters that characterize both the problem (k) and its environment (t, m and ℓ), is a lower bound. This work is then extended to the early deciding case. It presents a k-set agreement algorithm that directs the processes to decide and

stop by round $\min \left(\lfloor \frac{f}{\Delta} \rfloor + 2, \lfloor \frac{t}{\Delta} \rfloor + 1 \right)$. These bounds generalize the bounds previously established for solving the k-set agreement problem in pure synchronous systems.

Formal models for distributed computing   The *Iterated Immediate Snapshot* (IIS) model has been introduced by E. Borowsky and E. Gafni[18]. It is an asynchronous computation model where processes communicate through a sequence of one-shot *immediate snapshot* objects. It is known that this model is equivalent to the usual asynchronous read/write shared memory model, for wait-free task solvability. Its interest lies in the fact that its runs are more structured and easier to analyze than the runs in the shared memory model. As the IIS model and the shared memory model are equivalent for wait-free task solvability, a natural question is the following: "Are they still equivalent for wait-free task solvability, when they are enriched with the same failure detector?" Rajsbaum, Travers, and I showed in [R100] that the answer to this question is "no."

At first glance, this answer can appear counter-intuitive. So, the next question is the following: "Given a shared memory model enriched with a failure detector, what is an equivalent IIS model?" [C226] shows that an elegant way of capturing the power of a failure detector and other partially synchronous systems in the IIS model is by restricting appropriately its set of runs, giving rise to the *Iterated Restricted Immediate Snapshot* model (IRIS).

9.6   Software transactional memory and synchronization

I started becoming interested in software transactional memories (STM) in 2007. Basically, the problem consists in discharging the application programmer from the management of the underlying synchronization in multiprocess programs that access shared objects. From a practical point of view, STM systems are one of the most promising approach to take up challenge posed by the recent advance of multicore architectures and the deployment of multiprocessors as the mainstream computing platforms. From a theoretical point of view, STM systems give a new impetus that forces to rethink the way synchronization problems have to be solved (basically, synchronization is coming back, but it is not the same [C224]).

My initial contributions concern the following points. While the fate of a transaction is to commit or abort, no current STM specification states situations where the STM system is forced to commit a transaction. In [C231], with my PhD student D. Imbs, I introduced a new property called *obligation* that specifies situations where a transaction cannot be aborted. A corresponding STM protocol is presented and formally proved correct.

The second contribution is the definition of a general framework to state consistency conditions suited to STM systems [C236]. This framework not only encompasses serializability, strict serializability and opacity (that are "traditional" consistency conditions), but permits to define new meaningful consistency conditions. Among them the (new) *virtual world* condition is particularly interesting: it is less restrictive than than opacity, while requiring that (whatever the fact that it commits or aborts) any transaction always reads its values from a consistent global state.

10   Research activity during the period 2010 - 2015

Whatever their granularity, today distributed applications are pervasive and benefit everyone (e.g., P2P, cloud computing, sensors networks, or social networks for "large grain" applications, and multicore for "small grain" applications). All these applications are becoming larger and larger and more and more distributed. The development of such platforms and their usage have somehow preceded their theoretical

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[18]Borowsky E. and Gafni E., Immediate Atomic Snapshots and Fast Renaming. *Proc. 12th Principles of Distributed Computing (PODC'93)*, ACM Press, pp. 41-51, 1993.

foundations. Up to now, their design principles look sometimes more like a "trick" than well-mastered basic principles. The explosion of the number of distributed applications and the number of "computing adversaries" such as scaling, misbehaviors (also characterized as malicious behaviour when referring to entities attempting to voluntarily or not hurt the system), dynamicity, etc., makes their basic principles more and more difficult to grasp. Traditional algorithms simply do not fit this challenging new setting and it is required to revisit the field.

Hence, research addressing distributed computing theory that can benefit future applications is more needed than ever. This is a great challenge for the computer science community and contitutes my main research motivation since 2010. As already said, of my leitmotifs is "When something works we have to know why it works, and when it does not work we have to know why it does not work".

In the recent past my research activity focused on the foundations of distributed and concurrent computing. As already said, the world is distributed, and consequently more and more applications are distributed. This provided me with a strong motivation to work in this reaserach area. This section presents a subset of my works in this domain.

10.1   The visible part of the iceberg: a few figures in the past five years

- Publications (with review): 29 articles in journals, and 48 papers in conferences.

- Four books: 2 Morgan & Claypool (251 p. & 165 p., 2010), 2 Springer (512 p. & 510 p., 2013).

- Four Best paper awards in top conferences: (1) ACM Principles of Distributed Computing (PODC 2014, the top conference in the domain) [C301], (2) Symposium on Stabilization, Safety and Security of Distributed Systems (SSS 2011) [C269], (3) European Parallel Computing (Europar 2010) [253], and (4) Symposium on Distributed Computing (DISC 2010) [C254] (this last paper –co-authored with my PhD student F. Bonnet– obtained the "Best student paper").

- Winner of "Innovation in Distributed Computing' award (SIROCCO Prize) in 2015.

- Invited talks at top level international conferences: 5.

- Spring/Winter/Summer Schools and conference tutorials: 10.

- Main foreign co-authors (alphabetical order) during the period 2011-2014:
  S. Arevalo (Universidad Politècnica de Madrid, Spain), R. Baldoni (La Sapienza, Roma, Italy), J. Cao (Hong Kong Polytechnic University), A. Castañeda (UNAM, Mexico), A. Fernandez (Institute IMDA, Madrid, Spain), V. Gramoli (University of Sydney, Australia), M. Herlihy (Brown University, RI, USA), M. Larrea (University Basque Country, San Sebastian, Spain), Y. Moses (Technion, Israël)[19], S. Rajsbaum (UNAM, Mexico), G. Taubenfeld (Herlizya, Israël) W. Wu (Sun Yat-Sen University, Guangzhou, China).

10.2   Symmetry breaking

Symmetry breaking (in the presence of failures) is a fundamental problem of distributed computing. More precisely, processes in a concurrent system need to coordinate using an underlying shared memory or a message-passing system in order to solve agreement tasks such as, for example, consensus or set agreement. However, coordination is often needed to break the symmetry of processes that are initially in the same state, for example, to get exclusive access to a shared resource, to get distinct names, or to elect a leader.

I (with A. Castañeda, D. Imbs, and S. Rajsbaum) introduced and studied the family of generalized symmetry breaking (GSB) tasks, that includes election, renaming and many other symmetry breaking tasks [C265]. Differently from agreement tasks, a GSB task is inputless, in the sense that processes

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[19]Both M. Herlihy –Brown University– and Y. Moses –The Technion–, independently won the Dijkstra Prize and the Gödel Prize for their respective works.

do not propose values; the task only specifies the symmetry breaking requirement, independently of the initial state of the system (where processes differ only on their identifiers). Among various results characterizing the family of GSB tasks, we showed is shown that perfect renaming is universal for all GSB tasks [C275].

We then studied the power of renaming with respect to k-set agreement. We showed that, in a system of n processes, perfect renaming is strictly stronger than $(n-1)$-set agreement, but not stronger than $(n-2)$-set agreement. Furthermore, $(n+1)$-renaming cannot solve even $(n-1)$-set agreement. As a consequence, there are cases where set agreement and renaming are incomparable when looking at their power to implement each other. We also showed that there is a large family of GSB tasks that are more powerful than $(n-1)$-set agreement [C287]. Some of these tasks are equivalent to n-renaming, while others lie strictly between n-renaming and $(n+1)$-renaming. Moreover, none of these GSB tasks can solve $(n-2)$-set agreement. Hence, the GSB tasks have a rich structure and are interesting in their own. The proofs of these results are based on combinatorial topology techniques and new ideas about different notions of non-determinism that can be associated with shared objects. Interestingly, this paper sheds a new light on the relations linking set agreement and symmetry breaking. All these results are pieced together in [R140]. We also showed that the notion of a *process group* allows the renaming space to be reduced according to the number of process groups [C284].

10.3   Failure detectors

Hybrid distributed system   With my PhD student D. Imbs, I introduced an asynchronous crash-prone hybrid system model, where the system is hybrid in the way the processes can communicate. On the one side, a process can send messages to any other process. On another side, the processes are partitioned into clusters and each cluster has its own read/write shared memory. In addition to the model, one of our contributions concerns the implementation of an atomic register in this system model. More precisely, we introduced a new failure detector (denoted $M\Sigma$) and showed that, when considering the information on failures needed to implement a register, this failure detector is the weakest. To that end, we presented an $M\Sigma$-based algorithm that builds a register in the considered hybrid system model and showed that it is possible to extract $M\Sigma$ from any failure detector-based algorithm that implements a register in this model. We also (a) showed that $M\Sigma$ is strictly weaker than Σ (which is the weakest failure detector to implement a register in a classical message-passing system) and (b) presented a necessary and sufficient condition to implement $M\Sigma$ in a hybrid asynchronous communication system. These result are described in [R134] and [C269] (which obtained the Best Paper Award at SSS 2011.

Iterated distributed model   The basic distributed asynchronous read/write computation model is made up of n asynchronous processes which communicate by reading and writing atomic registers only. The distributed asynchronous iterated model is a more constrained model in which the processes execute an infinite number of rounds and communicate at each round with a new object called immediate snapshot object. Moreover, in both models up to $n-1$ processes may crash in an unexpected way. When considering computability issues, two main results are associated with the previous models. The first states that they are computationally equivalent for decision tasks. The second states that they are no longer equivalent when both are enriched with the same failure detector.

With my PhD student J. Steiner, I showed how to capture failure detectors in each model so that both models become computationally equivalent [C280]. To this end, I introduced the notion of a "strongly correct" process which appears particularly well-suited to the iterated model, and presents simulations that prove the computational equivalence when both models are enriched with the same failure detector. I also extended also these simulations to the case where the wait-freedom requirement is replaced by the notion of t-resilience. (The important new idea is here the notion of strongly correct processes. Those are the processes that "see" each other infinitely often. If, after some time, a process is late, it sees the

values written by the strongly correct processes but the values it writes are not seen by them.)

10.4 Anonymous systems

Due to the multiplicity of loci of control, a main issue distributed systems have to cope with lies in the uncertainty on the system state created by the adversaries that are asynchrony, failures, dynamicity, mobility, etc. Considering message-passing systems, I addressed (with my PhD student F. Bonnet) the uncertainty created by the net effect of asynchrony and process crash failures in systems where the processes are anonymous (i.e., processes have no identity and locally execute the very same algorithm).

Trivially, agreement problems such as consensus, that cannot be solved in non-anonymous asynchronous systems prone to process failures, cannot be solved either if the system is anonymous. So, we investigated failure detectors that allow processes to circumvent this impossibility.

In [R121] we introduced a failure detector class denoted ψ, that gives to each process an upper bound on the number of processes that are currently alive (in a non-anonymous system, the classes ψ and $\mathcal{P}$ -the class of perfect failure detectors- are equivalent). We designed a simple ψ-based consensus algorithm where the processes decide in $2t + 1$ asynchronous rounds (where t is an upper bound on the number of faulty processes), and showed shows that $2t + 1$ is a lower bound for consensus in the anonymous systems equipped with ψ. We then showed addressed early-decision, and presented and proved an early-deciding algorithm where the processes decide in $\min(2f + 2, 2t + 1)$ asynchronous rounds (where f is the actual number of process failures). This leads to think that anonymity doubles the cost (wrt synchronous systems) and it is conjectured that $\min(2f + 2, 2t + 1)$ is the corresponding lower bound.

We then continued our work of anonymous distributed systems and presented four failure detectors (denoted AP, $\overline{AP}$, $A\Omega$, and $A\Sigma$) and show that they are the "identity-free" counterparts of perfect failure detectors, eventual leader failure detectors and quorum failure detectors, respectively. $A\Sigma$ is new and showing that $A\Sigma$ and Σ have the same computability power in a non-anonymous system is not trivial. We also showed that the notion of failure detector reduction is related to the computation model. Then, we presented and proved correct a uniform anonymous consensus algorithm based on the failure detector pair $(A\Omega, A\Sigma)$ ("uniform" means here that not only processes have no identity, but no process is aware of the total number of processes). This new algorithm is not a simple "straightforward extension" of an algorithm designed for non-anonymous systems. To benefit from $A\Sigma$, it uses a novel message exchange pattern where each phase of every round is made up of sub-rounds in which appropriate control information is exchanged. Finally, we introduced the notions of failure detector hierarchy, weakest failure detector for anonymous consensus, and the implementation of identity-free failure detectors in anonymous systems. This work was published in [R133, C254].

I also studied the computability power of homonymous systems in [C277]. In these systems, several processes can have the same name. If all processes have distinct names we are in a classical dsitributed system, while we are in an anonymous system if all the processes have the same name. I mainly studied the solvability of the consensus problem in such a context.

10.5 Synchronous vs asynchronous systems: towards an equivalence

A message adversary is a daemon that suppresses messages in round-based message-passing synchronous systems in which no process crashes. This notion has first been introduced by N. Santoro and P. Widmayer a long time ago[20]. A property imposed on a message adversary defines a subset of messages that

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[20]N. Santoro and P. Widmayer, Time is not a healer, *Proc. 6th Annual Symposium on Theoretical Aspects of Computer Science (STACS'89)*, Springer LNCS 349, pp. 304-316, 1989. This notion is also addressed by Kuhn F., Lynch N.A., and Oshman R.,in their paper "Distributed computation in dynamic networks", *Proc. 42nd ACM Symposium on Theory of Computing (STOC'10)*, ACM press, pp. 513-522, 2010.

cannot be eliminated by the adversary. It has recently been shown[21] that when a message adversary is constrained by a property denoted TOUR (for tournament), the corresponding synchronous system and the asynchronous crash-prone read/write system have the same computability power for task solvability.

We my PhD student J. Stainer, I investigated in [C290] new message adversary properties (denoted SOURCE and QUORUM), and showed that the synchronous round-based systems whose adversaries are constrained by these properties are characterizations of classical asynchronous crash-prone systems (1) in which processes communicate through atomic read/write registers or point-to-point message-passing, and (2) enriched with failure detectors such as the eventual leader Ω and the quorum failure detector Σ. Hence these properties characterize maximal adversaries, in the sense that they define strongest message adversaries equating classical asynchronous crash-prone systems. They consequently provide strong relations linking round-based synchrony weakened by message adversaries with asynchrony restricted with failure detectors. This not only enriches our understanding of the synchrony/asynchrony duality, but also allows for the establishment of a meaningful hierarchy of property-constrained message adversaries.

10.6 Asynchronous systems with Byzantine processes

Since 2013, I started to work again on Byzantine failures (a process commits a Byzantine failure when it behaves arbitrarily). My main results are the following. They concern two of the most important problems of message-passing distributed computing in the presence of failures, namely, agreement (consensus) and the construction of a read/write shared memory abstraction.

Optimal consensus in the presence of Byzantine processes   With my colleague A. Mostéfaoui, I considered the consensus problem in asynchronous message-passing systems. We designed a new round-based asynchronous consensus algorithm that copes with up to $t < n/3$ Byzantine processes, where n is the total number of processes. In addition of not using signature, not assuming a computationally-limited adversary, while being optimal with respect to the value of t, this algorithm has several noteworthy properties: the expected number of rounds to decide is four, each round is composed of two or three communication steps and involves $O(n^2)$ messages, and a message is composed of a round number plus a single bit. To attain this goal, the consensus algorithm relies on a common coin as defined by Rabin, and a new extremely simple and powerful broadcast abstraction suited to binary values. The main target when designing this algorithm was to obtain a cheap and simple algorithm. This was motivated by the fact that, among the first-class properties, simplicity –albeit sometimes under-estimated or even ignored– is a major one.

This paper presentuing this result [C301] obtained the Best Paper Award at the ACM Conference on Principioles of Distributed Systems (PODC 2014), which is the premier conference in the domain.

Building a shared memory on top of a Byzantine message-passing system   With D. Imbs, S. Rajsbaum, and J. Stainer, I addressed the construction and the use of a shared memory abstraction on top of an asynchronous message-passing system in which up to t processes may commit Byzantine failures [C303]. This abstraction consists of arrays of n single-writer/multi-reader atomic registers, where n is the number of processes. A distributed algorithm building such a shared memory abstraction it first presented. This algorithm assumes $t < n/3$, which is shown to be a necessary and sufficient condition for such a construction. Hence, the algorithm is resilient-optimal. Then we presented a distributed algorithms built on top of this shared memory abstraction, which cope with up to t Byzantine processes. The simplicity of these algorithms constitutes a strong motivation for such a shared memory abstraction in the presence of Byzantine processes.

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[21]Afek Y. and Gafni E., Asynchrony from synchrony, *Proc. Int'l Conference on Distributed Computing and Networking (ICDCN'13)*, Springer LNCS 7730, pp. 225-239, 2013.

For a lot of problems, algorithms are more difficult to design and prove correct in a message-passing system than in a shared memory system. Using a protocol stacking methodology, the aim of the proposed abstraction is to allow an easier design (and proof) of distributed algorithms, when the underlying system is an asynchronous message-passing system prone to Byzantine failures.

10.7 Concurrent data structures

An atomic snapshot object is an object that can be concurrently accessed by asynchronous processes prone to crash. It is a fundamental object of concurrent programming in the presence of failures[22]. It is made of m components (base atomic registers) and is defined by two operations: an update operation that allows a process to atomically assign a new value to a component, and a snapshot operation that atomically reads and returns the values of all the components.

In [R127] I proposed an algorithm implementing a partial snapshot object, i.e., an object where the snapshot operation that can take any subset of the components as input parameter, and atomically reads and returns the values of this subset of components. This algorithm is based on new notions called called *help-locality* and *freshness*. Help-locality requires that an update operation helps only the concurrent partial snapshot operations that read the component it writes. When an update of a component r helps a partial snapshot, freshness requires that the update provides the partial snapshot with a value of the component r that is at least as recent as the value it writes into that component. (No snapshot algorithm proposed so far satisfies these properties). The algorithm is wait-free, linearizable and satisfies the previous efficiency properties. Interestingly, the principle that underlies the proposed algorithm is different from the one used so far, namely, it is based on the "write first, and help later" strategy. An improvement of the previous algorithm, based on LL/SC atomic registers, is also presented, which decreases the number of base registers from $O(n^2)$ to $O(n)$.

With T. Crain (Marie Curie PhD student) we investigated efficient implementations of concurrent data structures such as binary trees, skip-lists, etc. The corresponding results are described in [C273,C288,C291].

10.8 Software transactional memory

The aim of a Software Transactional Memory (STM) system is to discharge the programmer from the explicit management of synchronization issues. The programmer's job resides in the design of multiprocess programs in which processes are made up of transactions, each transaction being an atomic execution unit that accesses concurrent objects. The important point is that the programmer has to focus her/his efforts only on the parts of code which have to be atomic execution units without worrying on the way the corresponding synchronization has to be realized.

After having introduced the *virtual world consistency* (VWC) condition [R128], I have shown that the three properties read invisibility, permissiveness and opacuty are incompatible, while read invisibility, permissiveness and VWC are comptatible [C271]. While opacity requires that all the transactions (be them aborted or committed) appear as being totally ordered, VWC is weaker in as it only requires thta an aborted transaction be ordered with respect to committed transactions only. This allows more transactions to be committed.

Among other results I also designed (with my PhD students D. Imbs and T. Crain) a universal construction for transaction-based multiprocess systems [R135]. This construction is such that (1) every invocation of a transaction is executed exactly once and (2) the notion of commit/abort of a transaction remains unknown to the programmer. This system, which imposes restriction neither on the design of processes nor on their concurrency pattern, can be seen as a step towards the design of a deterministic

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[22]Afek Y., Attiya H., Dolev D., Gafni E., Merritt M. and Shavit N., Atomic Snapshots of Shared Memory. *Journal of the ACM*, 40(4):873-890, 1993.

universal construction to execute transaction-based multiprocess programs on top of a multiprocessor. Interestingly, the proposed construction is lock-free (in the sense that it uses no lock).

10.9 Miscellaneous

During the period 2010-2014, I also worked on other topics. I presents here only two of them.

An important concept is the concept of recursivity. I investigated recursivity asynchronous distributed systems where communication is through atomic read/write registers, and any number of processes can commit crash failures [R139,C274]. In such a context and differently from sequential and parallel recursion, the conceptual novelty lies in the fact that the aim of the recursion parameter is to allow each participating process to learn the number of processes that it sees as participating to the task computation.

A second important work is a joint work with Y. Moses [R130]. This work addresses the condition-based simultaneus consensus problem in synchronous message-passing systems (simulatzaneous means here that all processes have to stop during the very same round). The paper shows that, contrary to what could be hoped, when considering condition-based consensus with simultaneous decision, we can benefit from the best of both actual worlds (either the failure world or the condition world), namely, we cannot benefit from the sum of savings offered by both. Only the best discount applies.

11   Research agenda: At the frontiers of distributed computing

This part describes research topics in which I am currently involved. In order to be self-contained, it re-uses some material already stated in Part 4. In this way, Part 4 and Part 11 (this one) can be read independently.

11.1   Introduction

Preamble   Research constitutes one of the main *raisons d'être* of the Universities. It is an obligation for all professors and an absolutely necessary activity to maintain their lectures vivid and up-to-date. I do think that, as a university professor (in informatics), my research activity has to concentrate on understanding computing phenomena, introducing computing-related concepts and clarifying notions that are relevant to computing. That is why I always strove to design algorithms that are as generic and simple as possible. Being generic and simple, they are not bound to specific contexts and consequently capture the essence of the problem they solve (the complementary facet to capture their essence being the determination of the lower bounds associated with the problems they solve). I also do think that genericity and simplicity (that go with beauty and elegance) are first-class citizen criteria when designing solutions to computing problems. I am proud to have some of my algorithms (e.g., message causal ordering, checkpointing, randomized consensus) presented in textbooks written by experts in the domain (e.g., [1, 2, 3, 4]).
[1] Attiya H. and Welch J., Distributed Computing: Fundamentals, Simulations and Advanced Topics, (2d Edition), *Wiley-Interscience*, 414 pages, 2004.
[2] Garg V., Elements of Distributed Computing. *Wiley-Interscience*, 423 pages, 2002.
[3] Cachin Ch., Guerraoui R. and Rodrigues L., Introduction to Reliable and Secure Distributed Programming. *Springer*, 367 pages, 2011.
[4] Ksemkalyani A. and Singhal M., Distributed Computing: Principles, Algorithms, and Systems. *Cambridge University Press*, 738 pages, 2008.

A big picture   As already indicated, from a theoretical point of view, the aim of distributed computing is to answer the question: "Which problems can be solved by a set of cooperating entities, and, if the

answer is yes, which are the best algorithms for the corresponding problem (best according to some complexity measures)?" Since more than twenty years, this constitutes my research interests. In this context, my research programmes is focused on fundamental issues, namely investigate the limits of distributed computing in presence of *adversaries* such that asynchrony, failures, anonymity, dynamicity, etc. Lots of results are known for asynchronous systems prone to failures (e.g., the fundamental problem that is consensus has concentrated lots of efforts and its study has provided computer scientists with a deep knowledge on what constitutes a part of the essence of distributed computing). Despite these great advances, lot of work remains to be done. As an example, despite their interest in real applications, dynamicity and anonymity are not yet well understood. My research programmed looks in this direction and focuses on the following domains: distributed computability in asynchronous read/write shared memory systems, distributed computability in asynchronous message-passing systems, relations between the two previous distributed computing models, and concurrent objects. It is of great importance to develop a theory of distributed computing that provides us with concepts and paradigms that help us understand the possibilities and limitations of distributed systems. Such a knowledge is a necessary pre-requisite if one wants to master future (non-trivial) distributed applications.

Today distributed applications are pervasive, some very successful (e.g., Internet, P2P, social networks, cloud computing), and benefit everyone, but the design and the implementation of a lot of them still rely more on "tricks" than on a solid theory. The next generation of distributed applications and services will be more and more complex and requires that we spend today research efforts in establishing sane theoretical foundations to be able to master their design, their properties and their implementation. One of my leitmotifs is "When something works we have to know why it works, and when it does not work we have to know why it does not work".

Key-words   Anonymous systems, Asynchronous and synchronous systems, Distributed computability, Distributed computing, Dynamic systems, Message-passing system, Shared memory system, Fault-tolerance, Concurrent object, Synchronization.

11.2   Distributed computability

Be the communication medium a shared memory of a message-passing system, the aim of distributed computability is to answer the question "what can be computed in a distributed system?" I present below a few fundamental distributed computability problems in which I am interested.

From decision problems to the ranking of sub-consensus tasks   I became acquainted with this topic when I tried to establish a connection between the adaptive renaming problem and both the k-set agreement and the (weaker) k-test&set problem [C200,C216]. These works showed that the new space name can be reduced from $2p - 1$ (where p is the number of participating processes) to $2p - \lfloor \frac{p}{k} \rfloor$ if we have underlying k-test&set objects, and to $p + k - 1$ if we have underlying k-set agreement objects. These results encouraged me to to investigate the relation linking Test&set, adaptive agreement and set agreement. This investigation resulted in [C216]. This "warm-up" research period showed me the richness and the profoundness of the topic. As Test&set, adaptive agreement and set agreement are sub-consensus tasks (i.e., they are weaker than consensus), the "Holy grail" quest is here to establish a hierarchy of sub-consensus tasks (if any), similarly to the hierarchy of consensus tasks as defined by Herlihy. This line of research is fundamental if we want to understand the power of base synchronization primitives. In some sense, we can say that while Herlihy has established the "Mendeleiev's table" of consensus tasks, the research agenda is here to establish the corresponding table of sub-consensus tasks. The recent paper to appear in SIAM JC [R140] is a promising step in this direction, that I want to continue investigating.

Distributed universal construction A notion of a *universal construction* suited to distributed computing has been introduced by M. Herlihy in his celebrated paper on wait-free synchronization[23]. A universal construction is an algorithm that can be used to wait-free implement any object defined by a sequential specification. Herlihy's paper shows that the basic system model, which supports only atomic read/write registers, has to be enriched with consensus objects to allow the design of universal constructions. The generalized notion of a *k-universal* construction has been recently introduced by Gafni and Guerraoui[24]. A k-universal construction is an algorithm that can be used to simultaneously implement k objects (instead of just one object), with the guarantee that at least one of the k constructed objects progresses forever. While Herlihy's universal construction relies on atomic registers and consensus objects, a k-universal construction relies on atomic registers and k-simultaneous consensus objects (which are wait-free equivalent to k-set agreement objects in the read/write system model).

I intend to work on distributed universal constructions, and I already started thinking to build a very general universal construction with the following properties (not satisfied by previous universal constructions). (1) Among the k objects that are constructed, *at least* ℓ objects (and not just one) are guaranteed to progress forever; (2) The progress condition for processes is *wait-freedom*, which means that each correct process executes an infinite number of operations on each object that progresses forever; (3) If any of the k constructed objects stops progressing, all its copies (one at each process) stop in the same state; (4) The proposed construction is *contention-aware*, in the sense that it uses only read/write registers in the absence of contention; (5) It has to be *generous* with respect to the *obstruction-freedom* progress condition, which means that each process is able to complete any one of its pending operations on the k objects if all the other processes hold still long enough. Such a construction, that I call (k, ℓ)-universal, should be based on a simple extension of k-simultaneous consensus objects that I (with co-authors) introduced in [R117].

A lasting open problem: the weakest failure detector for message-passing k-set agreement Assuming each process proposes a value, the k-set agreement requires that each non-faulty process decides a value such that a decided value is a proposed value, and at most k different values are decided. This problem, which generalizes consensus, is impossible to solve in asynchronous crash-prone systems.

While the weakest failure detector for solving the k-set agreement problem in crash-prone asynchronous read/write shared memory systems is known [25], for message-passing systems the weakest failure detectors are known only for the extreme cases $k = 1$ and $k = n - 1$. The important remaining problem is then finding the weakest failure detector for any value of k. I think that answering this question is related to the minimal consistency properties a shared memory has to satisfy in order the k-set agreement problem can be solved (these properties being weaker than the classical properties associated with read/write operations). I started investigating this difficult question, but up to now I have only partial answers [R122,C270,C282]. Hence, despite the efforts of the community, this is an important and lasting consistency problem that belongs to my research programme. My hope is that solving this problem will give us a much clearer view of the relation between rerad/write shared memory systems and message-passing systems.

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[23]Herlihy M., Wait-free synchronization. *ACM Transactions on Programming Languages and Systems*, 13(1):124-149, 1991.

[24]Gafni E. and Guerraoui R., Generalizing universality. *Proc. 22nd Int'l Conference on Concurrency Theory (CONCUR'11)*, Springer, LNCS 6901, pp. 17-27, 2011.

[25]Gafni E. and Kuznetsov P., On set consensus number, *Distributed Computing*, 24(3-4):149-163, 2011, and Delporte C., Fauconnier H., Guerraoui R., and Tielmann A., The disagreement power of an adversary. *Distributed Computing* 24(3-4):137-147, 2011.

11.3 Fault-tolerance in the presence of Byzantine processes

A Byzantine process is a process that behaves arbitrarily. This type of process failures (be it intentional or not) can no longer be ignored in message-passing systems. This has motivated my recent effort on this topic (e.g., [C303] SIROCCO 2014, and [C301] Best Paper at PODC 2014). I intend to continue to work in this importan topic in the next years. More precisely, I want to address the following issues.

Multivalued Byzantine consensus   The paper [C301] describes a randomized signature-free algorithm that solves binary consensus with an expected cost of $O(n^2)$ messages. "Binary" means that only two different values can be proposed. Differently, any number of different values can be proposed to "multi-valued" consensus. It exists algorithms that solves multivalued consensus on top binary consensus, but the message cost of these reduction algorithms is $O(n^3)$. I have the intuition that the multivalued consensus problem can be solved with $O(n^2)$ expected messages. Such a gain would provide a definitive answer to the problem.

Another open problem that I want to address is the following. Let us consider the family of deterministic Byzantine consensus algorithms (i.e., algorithms which are not randomized algorithms). In such a context a fundamental question is the following: "Which is the weakest synchrony assumption needed to solve consensus in a message-passing system prone to Byzantine process failures?" This is a difficult problem on which I have some ideas and that I want to address.

Computability in the presence of Byzantine failures   Borowsky-Gafni's (BG) simulation[26] is a very powerful reduction algorithm designed for asynchronous read/write crash-prone systems, namely, it allows a set of $(t + 1)$ asynchronous sequential processes to wait-free simulate (i.e., despite the crash of up to t of them) an arbitrary number n of processes under the assumption that at most t of them crash. This shows that, in read/write crash-prone systems, t-resilience of decision tasks can be fully characterized in terms of wait-freedom. Said another way, the BG simulation shows that, in read/write systems, a crucial parameter is not the number n of processes, but the upper bound t on the number of processes that may crash in a run.

I intend to design BG-like simulations in the context of asynchronous message-passing systems (which has never been considered before). This will be done in two directions. The first will consider that processes may fail by crashing. Assuming $t < \min(n', n/2)$, the aim is to simulate a system of n' processes where up to t may crash, on top of a basic system of n processes where up to t may crash. The second simulation will concern the case where processes may commit Byzantine failures (up to now the BG simulation considered only process crahs failures). Assuming $t < \min(n', n/3)$, the aim is here to simulate a system of n' processes where up to t may be Byzantine, on top of a basic system of n processes where up to t may be Byzantine. Moreover, these asynchronous message-passing simulations have to be direct in the sense that they are not allowed to simulate a shared memory on top of which a suited read/write BG simulation would be used. These constraints are motivated by the fact that they help better understand the deep nature and the difference of crash failures and Byzantine failures in asynchronous message-passing systems.

11.4 Relating theory and practice

A Holy Grail: Is there a "Grand Unified Model"?   Synchronous systems and asynchronous systems are the two endpoints of the synchrony axis. With the new adversaries that are anonymity, dynamicity, mobility, etc., finding a distributed computing model that is both realistic and abstract enough (to be

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[26]Borowsky E. and Gafni E., Generalized FLP Impossibility Results for t-Resilient Asynchronous Computations. *Proc. 25th ACM Symposium on Theory of Computing (STOC'93)*, ACM Press, pp. 91-100, 1993, and Borowsky E., Gafni E., Lynch N. and Rajsbaum S., The BG Distributed Simulation Algorithm. *Distributed Computing*, 14:127-146, 2001.

tractable) is a real challenge, which will maybe remain an inaccessible scientific "holy grail". Like physicists who are looking for a "Grand Unified Theory" that would encompass all the fundamental concepts of physics, a (much more modest but still) very challenging task would consist in looking for a "Grand Unified Model" for distributed computing. Albeit answering this question seems to much ambitious, it remains at the horizon as a Leibnitz's dream. I started working very recently on this topic ([C290] is a very partial anwser to this fundamental issue) and I inted to continue.

Mathematics of distributed computing Since one year, after discussion with S. Rajsbaum (UNAM Mexico) and M. Herlihy (Brown University, RI, USA), I started becoming interested in topology as the part of mathematics that might provide us with underlying foundations of distributed computing. This approach is described in their very recent book[27].

I consequently worked with them and we wrote an introductory survey [R137]. We then introduced and investigated thhe notion of *solo* executions. A process runs solo when it computes its local output without receiving any information from other processes, either because they crashed or they are too slow. While in wait-free shared-memory models at most one process may run solo in an execution, any number of processes may have to run solo in an asynchronous wait-free message-passing model. We introduced a family of round-based wait-free models, called the d-*solo* models, $1 \leq d \leq n$, where up to d processes may run solo, and gave a characterization of the colorless tasks that can be solved in each d-*solo* model [C297]. These results establish for the first time a hierarchy of wait-free models that, while weaker than the basic read/write model, are nevertheless strong enough to solve non-trivial tasks.

I plan to continue investigating the topology approach to give sane foundations to distributed computing. Maybe this will help answering (partially) important questions raised in the previous section.

Engineering of distributed computing Practitioners and engineers have proposed a number of reusable frameworks and services to implement specific distributed services (from Remote Procedure Calls with Java RMI or SOAP-RPC, to JGroups for group communication, and Apache Zookeeper for primary backup replication). Unfortunately, many of these efforts lack a sound grounding in distributed computation theory (with the notable exceptions of JGroups and Zookeeper), and only provide punctual and partial solutions for a narrow range of services. From my point of view, this is because we still lack a generic framework that is able to unify the large body of fundamental knowledge on distributed computation that has been acquired over the last 20 years. A central issue of distributed computing consists consequently in bridging this gap, by developing a systematic model of distributed computation that organises the functionalities of a distributed computing system into reusable modular constructs. These constructs should be composable via well-defined mechanisms that maintain sound theoretical guarantees on the resulting system. In relation with my previous research topics, I intend to spend some time and efforts also in this direction, which is crucial for distributed computing engineering. Sound distributed computing engineering is related to the foundations of distributed computing.

12   International context and leading researchers

The main results in this domain appear in the annual ACM Int'l Symposium on Principles of Distributed Computing (PODC) and the annual Int'l Symposium on Distributed Computing (DISC). These are the two top conferences in the domain. PODC is traditionally held in North America, while DISC is in Europe. As far as journals are concerned, the journal Distributed Computing (published by Springer Verlag) is the top specialized journal of the community (approx. 25 articles per year). Papers on the

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[27]Herlihy M.P., Kozlov D., and Rajsbaum S., *Distributed computing through combinatorial topology*, Morgan Kaufmann/Elsevier, 336 pages, 2014 (ISBN 9780124045781).

theory of distributed computing appear in several top journals (e.g., Journal of ACM, SIAM Journal of Computing, Theoretical Computer Science, JCSS, etc.).

Among the leading researchers in the domain there are (arbitrary order!): Leslie Lamport (Microsoft), Nancy Lynch (MIT), R. Guerraoui (EPFL), H. Attiya (The Technion), Maurice Herlihy (Brown University), Nir Shavit (MIT), Eli Gafni (UCLA), Yoram Moses (The Technion, Israel), Danny Dolev (Hebrew University, Jerusalem), Sergio Rajsbaum (UNAM, MX), Yehuda Afek (Tel Aviv), Michael Fischer (Yale), Vassos Hadzilacos and Sam Toueg (Toronto), Faith Ellen (Toronto), Andrzej Pelc (Université du Québec en Outaouais), Nicola Santoro (Carlton University, Ottawa), Roger Wattenhoffer (ETHZ), Toshimitsu Masuzawa (Osaka University), Masafumi Yamachita (Kyushu University), David Peleg (Weizmann Institute), Paul Spirakis (Liverpool, UK), Nitin Vaidya (University of Illinois at Urbana Champaign), Shlomi Dolev (Ben Gourion University). Of course this list is far from being exhaustive. Their work and mine are complementary. Moreover, I have co-authored papers with several of them.

13   Writing another book

The major part of the existing books on distributed computing are targeted to PhD students, or researchers in the domain. So, if time permits, I would like to write an introductory book on fault-tolerant distributed computing targetting Master degree (i.e., a book not for my colleagues, but a book for students). This book will complement the twobooks I already wrote, published by Springer in 2013. A tentative title could be "*Fault-tolerant message-passing distributed systems: an algorithmic approach*".

More precisely, understanding distributed computing is not an easy task. This is due to the many facets of uncertainty one has to cope with and master in order to produce correct distributed software. Considering the uncertainty created by asynchrony, process failures (crash or Byzantine behavior), and message losses (captured with the notion of a message adversary), the book will focus on the main abstractions that one has to understand and master in order to be able to produce software with guaranteed properties. I will mainly consider the definition, the use, and the implementation of communication and agreement abstractions. Those are the fundamental abstractions that constitute the basic components of distributed fault-tolerant computing. As they give a precise meaning to the words "communicate " and "agree" despite asynchrony and failures, these abstractions allow distributed programs to be designed with properties that can be stated and proved. The book will also discuss impossibility results in the basic asynchronous failure-prone message-passing model, and will show how these impossibilities can be circumvented by assuming stronger synchrony assumptions, appropriate failure detectors, or randomization.

A   Theses

1. *Contribution à l'étude de la coopération entre processus dans les langages et les systèmes informatiques.* Thèse d'État, université de Rennes, 1981.

2. *Conception et réalisation d'une machine-langage de haut niveau adaptée à l'écriture de systèmes.* Thèse de 3ème cycle, université de Rennes, 1975.

B   Guest Editor of Int'l Journals

- Guest editor (with Andrzej Pelc and David Peleg) of the volume 384(2-3):135-286, of the journal *Theoretical Computer Science*, devoted to the publication of selected papers of SIROCCO 2005 (*12th Colloquium on Structural Information and Communication Complexity*.

- Guest editor of a volume of the journal *Theoretical Computer Science* (Volume 561(B):87-144, January 2015) devoted to the publication of selected papers of ICDCN 2013 (*14th Int'l Conference on Distributed Computing and Networking*).

- Guest editor of the Volume 98(8), published in August 2016, of the special issue of the Springer journal *Computing* devoted to selected papers of the international conference NETYS 2014 on networked systems (whose proceedings appeared in Springer LNCS 8593).

C   Books (author)

1. Algorithmique du parallélisme : le problème de l'exclusion mutuelle. *Dunod Ed.*, 160 pages, 1984.
   ▷ English translation: Algorithms for mutual exclusion, *The MIT Press,* 107 pages, 1986.
   ▷ Spanish translation: Algoritmica del paralelismo, *Omega S.A.*, Barcelona, 1988.
   ▷ Critical review 8704-0237 in *ACM Computing Reviews*, 28(4), 1987.

2. Algorithmes distribués et protocoles. *Eyrolles Ed.*, 142 pages, 1985.
   ▷ English translation: Distributed algorithms and protocols, *Wiley & Sons*, 1988.
   ▷ Critical review in *Software Practice and Experience*, 18(7):711, 1988.

3. Systèmes répartis et réseaux: concepts, outils et algorithmes. *Eyrolles Ed.*, 200 pages, 1987.
   ▷ English translation: Networks and distributed computation, *The MIT Press,* 166 pages, 1988.
   ▷ Critical review 8902-0036 in *ACM Computing Reviews*, 30(2):77, 1989.

4. Synchronisation et contrôle des systèmes et programmes répartis (with J.-M. Helary), *Eyrolles Ed.*, 200 pages, 1988.
   ▷ English translation: Synchronization and control of distributed systems and programs, *Wiley & Sons,* 160 pages, 1991.
   ▷ Critical review 9110-0751 in *ACM Computing Reviews*, 32(10):491, 1991.

5. La communication et le temps dans les réseaux et les systèmes répartis. (Tome 1 d'une introduction aux principes des systèmes répartis). *Eyrolles Ed., collection EDF,* 1991, 232 p.
   ▷ Préface de Robert Dautray, membre de l'Académie des Sciences.

6. Synchronisation et état global dans les systèmes répartis. (Tome 2 d'une introduction aux principes des systèmes répartis). *Eyrolles Ed., collection EDF*, 1992, 228 p.

7. Gestion des données réparties : problèmes et protocoles. (Tome 3 d'une introduction aux principes des systèmes répartis). *Eyrolles Ed., collection EDF*, 1993, 200 p.

8. Communication and Agreement Abstractions for Fault-Tolerant Asynchronous Distributed Systems. *Morgan & Claypool Publishers*, 251 pages, 2010 (ISBN 978-1-60845-293-4).
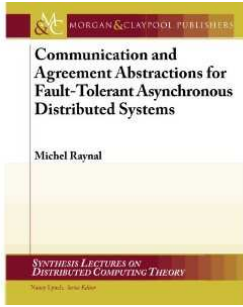
From the reviews:

As such this book is an ideal textbook for graduate students who have an interest in distributed computing; it will also work as a reference for researchers and interested professionals. The book is very well written and has a rigorous approach to the subject. () This maturity will allow the target audience to truly appreciate the clean and beautiful presentation of this difficult material.
(ACM Computing Reviews, February 18, 2011)

9. Fault-Tolerant Agreement in Synchronous Message-Passing Systems. *Morgan & Claypool Publishers*, 165 pages, 2010 (ISBN 978-1-60845-525-6).

10. Concurrent Programming: Algorithms, Principles and Foundations. *Springer*, 515 pages, 2012 (ISBN 978-3-642-32026-2).
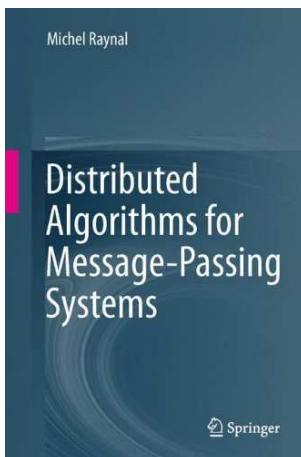
From the reviews:

"Concurrent programming is the study of the methods which will ensure correct interactions. ... Raynal (Univ. of Rennes, France) presents these classical techniques at the beginning of his book, and then moves on to cover such topics as transactional memory and current areas of research like consensus in the face of crash failures. The coverage is very up-to-date, including references through 2010. ... This would be an ideal text for a beginning graduate course. Summing Up: Highly recommended. Graduate students, researchers/faculty, and professionals/practitioners."
(P. Cull, Choice, Vol. 50 (11), August, 2013)

"A very comprehensive treatment of both fundamentals and recent results in concurrent programming is presented in this book. ... The book is well structured, with many examples to help the reader. Each chapter starts with a short presentation of the content and a list of keywords, and concludes with a summary of the main points and results. ... I can recommend this book ..."
(Sergei Gorlatch, ACM Computing Reviews, June, 2013)

11. Distributed Algorithms for Message-passing Systems. *Springer*, 510 pages, 2013 (ISBN: 978-3-642-38122-5).

From the reviews:

"The book presents in well structured manner the basic concepts and algorithms currently used in distributed systems based on message passing. ... The book can be used as textbook by undergraduate students in distributed systems. What distinguishes this book from similar ones are the text accessibility and the well organization of a classical material. Many figures and pseudo-codes are helping the understanding of the algorithms."
(Dana Petcu, zbMATH, Vol. 1282, 2014)

This book offers balanced coverage of the major topics encountered in courses on modern distributed computations. The text is primarily intended for courses on distributed systems; it can be used for both undergraduate and postgraduate courses. Overall, this title is an instructive and valuable book that deserves to be studied.
(Dimitrios Katsaros, ACM Computing Reviews, June, 2014)

D   Chapters in books and articles in encyclopdia

1. Chapter "Consensus in Asynchronous Distributed Systems: A Concise Guided tour", in *Advances Distributed Systems*, Springer, LNCS 1752, pp. 33-47, 2000 (with R. Guerraoui, M. Hurfin, A. Mostefaoui, R.

Oliveira and A. Schiper).

2. Chapter "Time in Distributed Systems: Models and Algorithms" in *Advances Distributed Systems*, Springer, LNCS 1752, pp. 33-47, 2000 (with Paulo Verissimo -Lisbon University-).

3. Chapter "Reliable Logical Clocks for Unreliable Process Groups" in "Dependable Network Computing" pp. 93-108, *Kluwer Academic Press*, 2001 (with A. Mostefaoui, M. Takizawa -Tokyo Denki University-).

4. Chapitre "Une introduction à l'algorithmique distribuée des systèmes asynchrones", *Encyclopédie Vuibert* de l'informatique et des systèmes d'information, pp. 179-194, 2006 (ISBN 978-2-7117-4846-4).

5. Article "Failure Detectors for Asynchronous Distributed Systems: an Introduction". *Wiley Encyclopdia of Computer Science and Engineering*, Vol. 2, pp. 1181-1191, 2009 (ISBN 978-0-471-38393-2).

6. Article " Set agreement", Second Edition of Encyclopedia of Algorithms, pp. 1956-1959, *Springer*, 2016 (ISBN 978-1-4939-2863-7).

7. Article " Distributed Snapshots", Second Edition of Encyclopedia of Algorithms, pp. 581-586, *Springer*, 2016 (ISBN 978-1-4939-2863-7).

8. Article "Messages adversaries", Second Edition of Encyclopedia of Algorithms, pp. 1272-1276, *Springer*, 2016 (ISBN 978-1-4939-2863-7).

E Papers in journals

Among my 159 publications in journals, 17 are in French and 142 in english. The title of the papers I consider as the most important are in bold characters.

Except for extremely few, the author list in my journal and conference papers obeys alphabetical order.

[R1] Une expression de la synchronisation pour les types abstraits. *RAIRO Revue Bleue/Computer Science*, 12(4):307-316, 1978.

[R2] An experience in implementing abstract data types. *Software Practice and Experience*, 11:315-320, 1980 (with M. Banatre, A. Couvert, c D. Herman).

[R3] Types in a mixed language system. *BIT*, (now *Nordic Journal of Computing*) 23(2):246-256, 1981 (with Ph. Darondeau, P. Le Guernic).

[R4] Une analyse de la spécification de la coopération entre processus par variables partagées. *Techniques et Science Informatiques (TSI)*, 1(3):201-210, 1982.

[R5] **Structured specification of communicating systems.** *IEEE Transactions on Computers*, vol.C32(2):120-133, 1983 (with G. von Bochmann).

[R6] Un algorithme d'exclusion mutuelle pour une structure logique en anneau. *Techniques et Science Informatiques (TSI)*, 4(5):471-474, 1985.

[R7] A distributed algorithm to prevent mutual drift between n logical clocks. *Information Processing Letters*, 24:199-202, 1987.

[R8] Parcours et apprentissage dans un réseau de processus communicants. *Techniques et Science Informatiques (TSI)*, 5(2):127-140, 1987 (with J.-M. Hélary, A. Maddi, N. Plouzeau).

[R9] Producteur-consommateur : quelques solutions réparties. *Techniques et Science Informatiques (TSI)*, 6(3):231-241, 1987 (with N. Plouzeau, J.-P. Verjus).

[R10] Calcul distribué d'un extremum et du routage associé dans un réseau quelconque. *Rairo Informatique Théorique et Applications*, 21(3):1-22, 1987 (with J.-M. Hélary, A. Maddi).

[R11] A distributed algorithm for mutual exclusion in an arbitrary network. *The Computer Journal*, 31(4):289-295, 1988 (En collaboration avec J.M. HÉLARY et N. PLOUZEAU).

[R12] **Un schéma abstrait d'itération répartie, application au calcul des chemins de valeurs minimales.** *Techniques et Science Informatiques (TSI)*, 8(3):259-268, 1989 (with J.-M. Hélary).

[R13] Prime numbers as a tool to design distributed algorithms. *Information Processing Letters*, 33(1):53-58, 1989.

[R14] Simulation répartie : schémas d'exécution pour un modèle à processus. *Techniques et Science Informatiques (TSI)*, 9(5):383-398, 1990 (with Ph. Ingels).

[R15] Vers la construction raisonnée d'algorithmes répartis, le cas de la terminaison. *Techniques et Science Informatiques (TSI)*, 10(3):203-209, 1991 (with J.-M. Hélary).

[R16] La communication causale dans les systèmes répartis, protocoles fondés sur le comptage. *Revue Réseaux et Informatique Répartie*, 1(1):87-99, 1991.

[R17] **The causal ordering abstraction and a simple way to implement it.** *Information Processing Letters*, 39:343-351, 1991 (with A. Schiper, S. Toueg).

[R18] A debugging tool for distributed Estelle programs. *Journal of Computer Communications*, 16(5):328-333, 1993 (with M. Hurfin, N. Plouzeau).

[R19] Protocoles simples pour l'implémentation répartie des sémaphores. *Annales des Télécommunications*, 48(5-6):260-273, 1993.

[R20] Un noyau réparti pour les applications fondées sur la progression d'un temps virtuel. *Revue Réseaux et Informatique Répartie*, 3(2):145-168, 1993 (with Ph. Ingels, C. Maziero).

[R21] Towards the Construction of Distributed Detection Programs with an Application to Distributed Termination. *Distributed Computing*, 7(3):137-147, 1994 (with J.-M. Hélary).

[R22] **A General Scheme for Token and Tree Based Distributed Mutual Exclusion Algorithms.** *IEEE Transactions on Parallel and Distributed Systems*, 5(11):1185-1196, 1994 (with J.-M. Hélary, A. Mostefaoui).

[R23] Déterminer un état global dans un système réparti. *Annales des télécommunications*, 49(7-8):460-469, (with J.-M. Hélary, A. Mostefaoui).

[R24] An implementation of global flush primitives using counters. *Parallel Processing Letters*, 5(2):171-178, 1995 (with M. Ahuja).

[R25] A Graph-based Characterization of communication modes in distributed executions. *Journal of Foundations of Computing and Decision Sciences*, 20(1):3-20, 1995 (with R. Baldoni -University of Roma-).

[R26] **Specification and Verification of Dynamic Properties in Distributed Computations**. *Journal of Parallel and Distributed Computing,* 28(2): 173-185, 1995 (with O. Babaoğlu -University of Bologna-).

[R27] Distributed algorithms for static and dynamic termination detection. *Bulletin of the Polish Academy of Sciences*, 43(3):363-380, 1995 (with J. Brzezinsky -University of Poznan-, J.-M. Hélary).

[R28] **On-the-fly Analysis of Distributed Computations**. *Information Processing Letters*, 54:267-274, 1995 (with E. Fromentin, C. Jard, G.-V., Jourdan).

[R29] Semantics of recovery lines for backward recovery in distributed systems. *Annales des Télécommunications*, 50(10-11):874-887, 1995 (with J. Brzezinsky -University of Poznan-, J.-M. Hélary).

[R30] **Deadlock models and a general algorithm for distributed deadlock detection**. *Journal of Parallel and Distributed Computing*, 31(2):112-125, 1995. (with J. Brzezinsky -University of Poznan-, J.-M. Hélary, M. Singhal -Ohio University-).

[R31] An introduction to Snapshot Algorithms in Distributed Computing, *Journal of Distributed Systems Engineering*, 2(4):224-233, 1995 (with A. Kshemkalyani, M. Singhal -Ohio state university-).

[R32] Causal Delivery of messages with Real-Time Data in unreliable networks, *Real-Time Systems Journal*, 10(3): 245-262, 1996 (with R. Baldoni, A. Mostefaoui).

[R33] Logical time: capturing causality in distributed systems. *IEEE Computer*, 29(2):49-57, 1996 (with M. Singhal).

[R34] An Optimistic Protocol for a Linearizable Distributed Shared Memory System. *Parallel Processing Letters*, 6(2):65-278, 1996 (with M. Mizuno, M. Neilsen -Kansas state university-).

[R35] A Unified Framework for Expressing and Detecting Run-Time Properties of Distributed Computations. *Journal of Systems Software*, 33(3):287-298, 1996 (with O. Babaoglu, E. Fromentin).

[R36] **From group communication to transactions in distributed systems**. *Communications of the ACM*, 39(4):84-90, 1996 (with A. Schiper).

[R37] On-the-fly detection of a class of words-based patterns in labeled Dags. *Applied Mathematics and Computer Science*, 7(1):205-216, 1997 (with M. Hurfin).

[R38] Adaptive checkpointing in message-passing distributed systems. *Int'l Journal of Systems Science*, 28(11):1145-1161, 1997. (with R. Baldoni, J.-M. Helary, A. Mostefaoui).

[R39] K-arbiter: a safe and general scheme for h out of k mutual exclusion. *Theoretical Computer Science*, 193(1-2):97-112, 1998. (with R. Baldoni, Y. Manabe -NTT, Japan-). ▷ Critical review in *ACM Computing Reviews*, 39(11):572.

[R40] An adaptive causal ordering algorithm suited to mobile computing environments. *Journal of Parallel and Distributed Computing*,41(1):190-204, 1997 (with M. Singhal, R. Prakash).

[R41] **Shared Global States in Distributed Computations**. *Journal of Computer and System Sciences*, 55(3):522-528, 1997 (with E. Fromentin).

[R42] Revisiting the non-blocking atomic commitment problem in distributed data management systems. *Ingénierie des Systèmes d'Information*, 5(6):639-659, 1997.

[R43] A suite of definition for consistency criteria in distributed shared memories. *Annales des Télécommunications*, 52(11-12):652-661, 1997 (with A. Schiper).

[R44] Efficient delta-causal broadcasting. *Journal of Computer Systems Science and Engineering*, vol. 13(5):263-270, 1998 (with R. Baldoni, R. Prakash, M. Singhal).

[R45] Consistent records in asynchronous computations. *Acta Informatica*, 35:441-455, 1998 (with R. Baldoni, J.-M. Helary).

[R46] De la validation atomique au consensus: une approche synthétique. *Techniques et Science Informatiques (TSI)*, 17(3):279-298, 1998 (with R Guerraoui, A. Schiper).

[R47] Points de contrôle dans les systèmes répartis : concepts et protocoles. *Techniques et Science Informatiques (TSI)*, 17(10):1223-1246, 1998 (with A. Mostefaoui, J.-M. Helary).

[R48] **Efficient distributed detection of conjunction of local predicates**. *IEEE Transactions on Software Engineering*, 24(8):664-677, 1998. (with M. Hurfin, M. Mizuno, M. Singhal).
▷ Critical review in *ACM Computing Reviews*, 39(10):527.

[R49] **Consistency issues in distributed checkpoints.** *IEEE Transactions on Software Engineering*, 25(4):274-281, 1999 (with R. Netzer, J.-M. Helary).

[R50] Non-Blocking Atomic Commitment in Distributed Systems: A tutorial based on a generic protocol. *Journal of Computer Systems Science and Engineering*, 15(2):77-86, 2000.

[R51] **Normality: a Consistency criterion for concurrent objects.** *Parallel Processing Letters*, 9(1):123-134, 1999 (with V. Garg, Austin).

[R52] An adaptive architecture for causally consistent distributed services. *Distributed Systems Engineering Journal*, 6(2):63-70, 1999 (with M. Ahamad, G. Thia-Kime).

[R53] **Communication-induced determination of consistent snapshots**. *IEEE Transactions on Parallel and Distributed Systems*, 10(9):865-877, 1999 (with J.-M. Helary, A. Mostefaoui).

[R54] A simple and Fast Asynchronous Consensus Protocol Based on a Weak Failure Detector. *Distributed Computing*, 12(4):209-223, 1999 (with M. Hurfin).

[R55] Group membership failure detection: a simple protocol and its probabilistic analysis. *Distributed Systems Engineering Journal*, 6(3):95-102, 1999 (with F. Tronel).

[R56] Restricted Failure Detectors: Definition and Reduction Protocols. *Information Processing Letters*, 72:91-97, 1999 (with F. Tronel).

[R57] **Communication-based prevention of useless checkpoints in distributed computations**. *Distributed Computing*, 13(1):29-43, 2000. (with R. Netzer, A. Mostefaoui, J.-M. Helary).

[R58] **From Binary Consensus to Multivalued Consensus in Asynchronous Message-Passing Systems**. *Information Processing Letters*, 73:207-213, 2000. (with A. Mostefaoui, F. Tronel).

[R59] **Computing Global Functions in Asynchronous Distributed Systems with Perfect Failure Detectors**. *IEEE Transactions on Parallel and Distributed Systems*, 11(9):897-909, 2000 (with J.-M. Hélary, M. Hurfin, A. Mostefaoui, F. Tronel).

[R60] Fault-Tolerant Consensus-Based Total Order Multicast. *IEEE Transactions on Parallel and Distributed Systems*. 13(2):147-157, 2001 (with U. Fridzke, Ph. Ingels, A. Mostefaoui).

[R61] Impossibility of Scalar Clock-Based Communication-Induced Checkpointing Protocols Ensuring the RDT Property. *Information Processing Letters*, 80:105-111, 2001 (with R. Baldoni, A. Mostefaoui, J.-M. Hélary).

[R62] Rollback-dependency trackability: a minimal characterization and its protocol. *Information and Computation*, 165(2):144-173, 2001 (with R. Baldoni, J.-M. Hélary).

[R63] Direct Dependency-Based Determination of Consistent Global Checkpoints. *Journal of Computer Systems Science and Engineering*, 16(1):43-50, 2001 (with R. Baldoni, G. Cioffi, J.M. Helary).

[R64] The Logically Instantaneous Communication Mode: a Communication Abstraction. *Future Generation of Computer Systems*, 17(6):669-678, March 2001. (with A. Mostefaoui, P. Verissimo).

[R65] Mastering Agreement Problems in Distributed Systems. *IEEE Software*, 18(4):40-47, 2001 (with M. Singhal).

[R66] Consistent Checkpointing for Transaction Systems. *The Computer Journal*, 44(2):92-100, 2001 (with R. Baldoni, F. Quaglia).

[R67] **Leader-Based Consensus**. *Parallel Processing Letters*, 11(1):95-107, 2001 (with A. Mostefaoui).

[R68] Fundamentals of Distributed Computing: A Practical Tour of Vector-Clock Systems. *IEEE Distributed Systems Online* (http://www.computer.org/dsonline), 3(2):1-18, 2002 (with R. Baldoni).

[R69] **A versatile family of consensus protocols based on Chandra-Toueg's unreliable failure detectors**. *IEEE Transactions on Computers*, 51(4):395-408, 2002. (with M. Hurfin, A. Mostefaoui).

[R70] **Interval Consistency of Asynchronous Distributed Computations**. *Journal of Computer and System Sciences,* 64(2):329-349, 2002 (with A. Mostefaoui, J.-M. Hélary).

[R71] Real-Time Based Consistency Models for Distributed Objects. *Journal of Computer Systems Science and Engineering*, 17(2):133-142, 2002 (with M. Ahamad, F. Torres, Georgia Tech).

[R72] An Introduction to Oracles for Asynchronous Distributed Systems. *Future Generation Computer Systems*, 18(6):757-767, 2002 (with E. Mourgaya, A. Mostefaoui).

[R73] A Note on the Determination of the Immediate Predecessors in a Distributed Computation. *Int'l Journal of Foundations of Computer Science (IJFCS)*, 13(6):865-972, 2002 (with E. Anceaume, J.M. Helary).

[R74] Token-Based Sequential Consistency. *Journal of Computer Systems Science and Engineering*, 17(6):359-365, 2002.

[R75] **Efficient Causality-Tracking Timestamping**. *IEEE Transactions on Knowledge and Data Engineering*, 15(5): 1239-1250, 2003 (with R. Baldoni, J.-M. Hélary, G. Melideo).

[R76] Early Stopping in Global Data Computation. *IEEE Transactions on Parallel and Distributed Systems*, 14(9):909-921, 2003 (with C. Delporte-Gallet, H. Fauconnier, J.-M. Hélary).

[R77] Atomic Broadcast in Asynchronous Crash-Recovery Distributed Systems and its use in Quorum-Based Replication. *IEEE Transactions on Knowledge and Data Engineering*, 15(5):1206-1217, 2003 (with L. Rodrigues, Lisboa, Portugal).

[R78] **Conditions on Input Vectors for Consensus Solvability in Asynchronous Distributed Systems**. *Journal of the ACM*, 50(6):922-954, November 2003. (with A. Mostefaoui, S. Rajsbaum).

[R79] Consensus in Byzantine Asynchronous Systems. *Journal of Discrete Algorithms*, 1(2):185-210, 2003 (with R. Baldoni, J.-M. Hélary, L. Tanguy).

[R80] **Condition-Based Consensus Solvability: a Hierarchy of Conditions and Efficient Protocols**. *Distributed Computing*, 17(1):1-20, 2004 (with A. Mostefaoui, S. Rajsbaum, M. Roy).

[R81] Necessary and Sufficient Condition for Transforming Limited Accuracy Failure Detectors. *Journal of Computer and System Sciences,* 68:123-133, 2004 (with E. Anceaume, A. Fernandez, A. Mostefaoui, G. Neiger).

[R82] The Information Structure of Indulgent Consensus. *IEEE Transactions on Computers*, 53(4):453-466, 2004 (with R. Guerraoui).

[R83] A Weakest Failure Detector-Based Asynchronous Consensus Protocol for $f < n$. *Information Processing Letters*, 90(1):39-46, 2004 (with R. Friedman, A. Mostefaoui).

[R84] Quorum-Based Multi-Invocation Model for Replicated Objects. *Concurrent Engineering: Research and Application Journal*, June 2004. (with T. Enokido, K. Hori, M. Takizawa -Tokyo-).

[R85] Wait-Free Computing: an Introductory Lecture. *Future Generation Computer Systems*, 21(5):655-663, 2005.

[R86] Asynchronous Bounded Lifetime Failure Detectors. *Information Processing Letters*, 94(2):85-91, 2005 (with R. Friedman, A. Mostefaoui).

[R87] A Short Introduction to Failure Detectors for Asynchronous Distributed Systems. *ACM Sigact News, Distributed Computing Column*, 36(1):53-70, 2005.

[R88] Stabilizing Mobile Philosophers. *Information Processing Letters*, 95(1):299-306, 2005 (with A. Datta, M. Gradinariu).

[R89] $\Diamond \mathcal{P}_{mute}$-Based Consensus for Asynchronous Byzantine Systems. *Parallel Processing Letters*, 15(1-2):162-182, 2005 (with R. Friedman, A. Mostefaoui).

[R90] **Simple and Efficient Oracle-Based Consensus Protocols for Asynchronous Byzantine Systems**. *IEEE Transactions on Dependable and Secure Computing*, 2(1):46-56, 2005 (with R. Friedman, A. Mostefaoui).

[R91] **Synchronous Condition-Based Consensus**. *Distributed Computing*, 18(5):325-343, 2006 (with A. Mostefaoui, S. Rajsbaum).

[R92] Time-free and timer-based assumptions can be combined to get eventual leadership. *IEEE Transactions on Parallel and Distributed Systems*, 17(7):656-666, 2006 (with A. Mostefaoui, C. Travers).

[R93] A Time-free Assumption to Implement Eventual Leadership. *Parallel Processing letters*, 16(2):189-208, 2006 (with A. Mostefaoui, E. Mourgaya, C. Travers).

[R94] From $\Diamond \mathcal{W}$ to Ω: a simple bounded quiescent reliable broadcast-based transformation. *Journal of Parallel and Distributed Computing*, 67(1):125-129, 2007 (with A. Mostefaoui, S. Rajsbaum, C. Travers).

[R95] **The Alpha of indulgent consensus**. *The Computer Journal*, 50(1):53-67, 2007 (with R. Guerraoui).

[R96] An adaptive programming model for fault-tolerant distributed computing. *IEEE Transactions on Dependable and Secure Computing*, 4(1):18-31, 2007 (with S. Gorender, R. Macedo, Salvador de Bahia, Brazil).

[R97] On the Respective Power of $\Diamond \mathcal{P}$ and $\Diamond \mathcal{S}$ to Solve One-Shot Agreement Problems. *IEEE Transactions on Parallel and Distributed Systems*, 18(5):589-597, 2007 (with R. Friedman, A. Mostefaoui).

[R98] **Distributed agreement problems and their connection with error-correcting codes**. *IEEE Transactions on Computers*, 56(7):865-875, 2007 (with Friedman R., A. Mostefaoui, S. Rajsbaum).

[R99] Design and Performance Evaluation of Efficient Consensus Protocols for Mobile Ad Hoc Networks. *IEEE Transactions on Computers*, 56(8):1055-1070, 2007 (with Jiannong Cao, J. Yang, W. Wu -Hong-Kong-).

[R100] An Impossibility about Failure Detectors in the Iterated Immediate Snapshot Model. *Information Processing Letters*, 108(3):160-164, 2008 (with S. Rajsbaum, C. Travers).

[R101] Modularity: a First Class Concept to Address Distributed Systems. *ACM Sigact News*, 39(2):91-110, 2008. (with A.-M. Kermarrec, R. Friedman).

[R102] Using asynchrony and zero-degradation to speed up indulgent consensus protocols. *Journal of Parallel and Distributed Computing*. 68(7):984-996, 2008 (with J. Cao, W. Wu, J. Lin, Hong-Kong Polytechnic University).

[R103] On the Computability Power and the Robustness of Set Agreement-oriented Failure Detector Classes. *Distributed Computing*, 21(3):201-222, 2008 (with A. Mostefaoui, S. Rajsbaum, C. Travers).

[R104] Anonymous graph exploration without collision by mobile robots. *Information Processing Letters*. 109:98-103, 2008 (with R. Baldoni, F. Bonnet, A. Milani).

[R105] **The combined power of conditions and information on failures to solve asynchronous set agreement**. *SIAM Journal of Computing*, 38(4):1574-1601, 2008 (with A. Mostefaoui, S. Rajsbaum, C. Travers).

[R106] From adaptive renaming to set agreement. *Theoretical Computer Science*, 410(14-15): 1328-1335, 2009 (with E. Gafni, A. Mostefaoui, C. Travers).

[R107] On the fly estimation of the processes that are alive in an asynchronous message-passing system. *IEEE Transactions on Parallel and Distributed Systems*, 20(6):778-787, 2009 (with A. Mostefaoui, G. Trédan).

[R108] **Revisiting Simultaneous Consensus with Crash Failures.** *Journal of Parallel and Distributed Computing*, 69:400-409, 2009 (with Y. Moses, the Technion, Israel).

[R109] A note on atomicity: boosting Test&Set to solve Consensus. *Information Processing Letters*, 109(12):589-591, 2009 (with D. Imbs).

[R110] **Conditions for set agreement with an application to synchronous systems**. *Springer Journal Computer Science and Technology*, 24(3):418-433, 2009 (with F. Bonnet).

[R111] Eventual Clusterer: a Modular Approach to Designing Hierarchical Consensus Protocols in MANETs. *IEEE Transactions on Parallel and Distributed Systems*, 20(6):753-765, 2009 (with J. Cao, W. Wu, Hong-Kong Polytechnic University).

[R112] **Strongly Terminating Early-Stopping k-set Agreement in Synchronous Systems with General Omission Failures.** *Theory of Computing Systems*, 17(1):259-287, 2010 (with Ph. Raipin Parvedy, C. Travers).

[R113] **A timing assumption and two t-resilient protocols for implementing an eventual leader service in asynchronous shared-memory systems**, *Algorithmica*, 56(4):550-576, 2010 (with A. Fernandez, E. Jimenez, G. Trédan).

[R114] **Narrowing Power vs Efficiency in Synchronous Set Agreement: Relationship, Algorithms and Lower Bound**. *Theoretical Computer Science*, 411(1):58-69, 2010. (with Mostefaoui, C. Travers).

[R115] A Methodological Construction of an Efficient Sequentially Consistent Distributed Shared Memory. *The Computer Journal*, 53(9):1523-1534, 2010. (with V. Cholvi, A. Fernandez, E. Jimenez, and P. Manzano, Madrid).

[R116] From an Asynchronous Intermittent Rotating Star to an Eventual Leader. *IEEE Transactions on Parallel and Distributed Systems*, 21(9):1290-1303, 2010. (with A. Fernandez, Madrid).

[R117] **The k-simultaneous consensus problem**. *Distributed Computing*, 22(3):185-196, 2010. (with Y. Afek, E. Gafni, S. Rajsbaum, C. Travers).

[R118] **A simple proof of the necessity of the failure detector Σ to implement an atomic register in asynchronous message-passing systems**. *Information Processing Letters*, 110(4):153-157, 2010, (with F. Bonnet).

[R119] Eventual Leader election with weak assumptions on initial knowledge, communication reliability and synchrony. *Springer Journal of Computer Science and Technology (JCST)*, 25(6):1267-1281, 2010 (With A. Fernandez and E. Jimenez, Madrid).

[R120] Software Transactional Memories: an Approach for Multicore Programming. *Springer Journal of Super-computing*, 57(2):203-215, 2011. (With D. Imbs).

[R121] **The Price of anonymity: optimal consensus despite asynchrony, crash and anonymity**. *ACM Transactions on Autonomous and Adaptive Systems (TAAS)*, 6(4):Article 23 (28 pages), October 2011. (With F. Bonnet).

[R122] On the road to the Weakest Failure Detector for k-Set Agreement in Message-passing Systems. *Theoretical Computer Science*, 412(33):4272-4284, 2011. (With Bonnet).

[R123] Failure Detectors to Solve Asynchronous k-Set Agreement: a Glimpse of Recent Results. *Bulletin of the European Association of Theoretical Computer Science (EATCS)*, 103(1):75-95, 2011.

[R124] A Liveness Condition for Concurrent Objects: x-Wait-freedom. *Concurrency and Computation: Practice and experience*, 23:2154-2166, 2011. (With D. Imbs).

[R125] The renaming problem in shared memory systems: an introduction. *Elsevier Computer Science Review*, 5:229-251, 2011. (With A. Castaneda and S. Rajsbaum, UNAM Mexico).

[R126] Implementing a Regular Register in an Eventually Synchronous Distributed System prone to Continuous Churn. *IEEE Transactions on Parallel and Distributed Systems*, 23(1):102-109, 2012. (With S. Bonomi, R.Baldoni, Roma).

[R127] **Help when needed, but no more: an efficient partial snapshot algorithm**. *Journal of Parallel and Distributed Computing*, 72(1):1-12, 2012. (With D. Imbs.)

[R128] **Virtual world consistency: a condition for STM systems (with a versatile protocol with invisible read operations)**. *Theoretical Computer Science*, 444:113-127, 2012. (with D. Imbs.)

[R129] Specifying and Implementing an Eventual Leader Service for Dynamic Systems. *International Journal of Web and Grid Services*, 8(3):204-224, 2012. (With Larrea M., Soraluze I. and Roberto Cortiñas R., San Sebastian, Spain.)

[R130] **No double discount: condition-based simultaneity yields limited gain**. *Information and Computation*, 214:45-56, May 2012. (With Y. Moses, Israel).

[R131] From the *Happend-Before* relation to the causal ordered set abstraction. *Journal of Parallel and Distributed Computing*, 72:791-795, 2012. (With S. Pomarez and J.R. Perez Cruz, Puebla University, Mexico).

[R132] Computability in distributed computing: a tutorial. *ACM Sigact News, Distributed Computing Column*, 43(3), pp. 80-102, 2012. (With M. Herlihy, S. Rajsbaum.)

[R133] **Anonymous asynchronous systems: the case of failure detectors**, *Distributed Computing*, 26(3):141-158, 2013. (With F. Bonnet).

[R134] **The weakest failure detector to implement a register in asynchronous systems with hybrid communication**. *Theoretical Computer Science*, 512:130-142, 2013. (With D. Imbs).

[R135] Towards a universal construction for transaction-based multiprocess programs. *Theoretical Computer Science*, 496:154-169, 2013. (With T. Crain, D. Imbs).

[R136] Trust-aware peer sampling: performance and privacy tradeoffs. *Theoretical Computer Science*, 512:67-83, 2013. (With Frey D., Jegou A., Kermarrec A.-M., and Stainer J.)

[R137] **Power and limits of distributed computing shared memory models.** *Theoretical Computer Science*, 509:3-24, 2013. (With M. Herlihy, S. Rajsbaum).

[R138] Computabilidad distribuida. (In Spanish.) *Miscelánea Mathematica*, 56:113-144, 2013 (ISSN-1665-5478). (With M. Herlihy, S. Rajsbaum).

[R139] An introductory tutorial to concurrency-related distributed recursion. *Bulletin of the European Association of Theoretical Computer Science (EATCS)*, 111:57-75, (2013). (With S. Rajsbaum.)

[R140] **Signature-free asynchronous binary Byzantine consensus with $t < n/3$, $O(n^2)$ messages, and $O(1)$ expected time**. *Journal of ACM*, 62(4), Article 31, 21 pages, 2015. (With A. Mostéfaoui and H. Moumen).

[R141] Failure detectors in homonymous distributed systems (with an application to consensus). *Journal of Parallel and Distributed Computing*. 83:83-95, 2015. (With S. Arevalo, A. Fernandez, D. Imbs, and E. Jimenez).

[R142] Predicate detection in asynchronous distributed systems: a probabilistic approach. *IEEE Transactions on Computers*, 65(1):173-186, 2016. (With J. Cao -HK Polytechnic-, W. Zhu -Wuhan university-, China). DOI:10.1109/TC.2015.2409839.

[R143] **Intrusion-tolerant broadcast and agreement abstractions in the presence of Byzantine processes**. *IEEE Transactions on Parallel and Distributed Systems*, 27(4):1085-1098 (2016) (With A. Mostéfaoui).

[R144] Distributed slicing in dynamic systems. *IEEE Transactions on Parallel and Distributed Systems*. 27(4):1030-1043 (2016) (With A. Fernández, V. Gramoli, E. Jiménez, and A.-M. Kermarrec).

[R145] **Generalized Symmetry Breaking Tasks and Non-Determinism in Concurrent Objects**. *SIAM Journal of Computing*, 45(2):379-414 (2016) (With A. Castañeda, D. Imbs, and S. Rajsbaum).

[R146] Implementing set objects in dynamic distributed systems. *Journal of Computer and System Sciences*, 82(5):654-689, 2016. (With R. Baldoni, S. Bonomi, Università La Sapienza, Roma).

[R147] Read/Write shared memory abstraction on top of an asynchronous Byzantine message-passing system. *Journal of Parallel and Distributed Computing*, 93-94:1-9 (2016) (With D. Imbs, S. Rajsbaum and J. Stainer).

[R148] A fast contention-friendly binary search tree. *Parallel Processing Letters*, 26(3):1-17 (2016). (With T. Crain, V. Gramoli).

[R149] **Distributed universality**. *Algorithmica*. 76(2):502-535, 2016, (With J. Stainer and G. Taubenfeld). DOI 10.1007/s00453-015-0053-3.

[R150] A necessary condition for Byzantine k-set agreement. *Information Processing Letters*, 116(12):757-759, 2016. (With Z. Bouzid and D. Imbs.)

[R151] **Trading t-resilience for efficiency in asynchronous Byzantine reliable broadcast**. *Parallel Processing Letters*, Vol. 26(4), 8 pages (2016) (With D. Imbs)

[R152] A distributed leader election algorithm in crash-recovery and omissive systems. *Information Processing Letters*, 118:100-104, 2017. (With C. Fernández-Campusano, M. Larrea, and R. Cortiñas, University of the Basque Country).

[R153] Distributed universal constructions: a guided tour. *Bulletin of the European Association of Theoretical Computer Science (EATCS)*, 121(1):64-96 (2017)

[R154] **Atomic read/write memory in signature-free Byzantine asynchronous message-passing systems**. In *Springer Theory of Computing Systems*, 60(4):677-694 (2017) (With A. Mostéfaoui, M. Petrolia, and Cl. Jard, Université de Nantes). DOI: 10.1007/s00224-016-9699-8.

[R155] **Signature-free asynchronous Byzantine systems: from multivalued to binary consensus with $t < n/3$, $O(n^2)$ messages, and constant time**. To appear in *Acta Informatica*, DOI 10.1007/s00236-016-0269-y, 20 pages, 2016. (With A. Mostéfaoui.)

[R156] Randomized k-set agreement in crash-prone and Byzantine asynchronous systems. To appear in *Theoretical Computer Science*. (With A. Mostéfaoui and H. Moumen).

[R157] **Anonymous obstruction-free (n, k)-set agreement with $(n - k + 1)$ atomic read/write registers**. To appear in *Distributed Computing*. (With Z. Bouzid and P. Sutra.)

[R158] Making local algorithms wait-free: the case of ring coloring. To appear in *Springer Theory of Computing Systems*. (With A. Castañeda, C. Delporte and H. Fauconnier, Université Paris 7, and S. Rajsbaum, UNAM, Mexico.)

[R159] **From wait-free to arbitrary concurrent solo executions in colorless distributed computing**. To appear in *Theoretical Computer Science*. (With M. Herlihy, S. Rajsbaum, and J. Stainer).

———————————————————— Articles currently submitted ————————————————————

[R160] t-**Resilient** k-**immediate snapshot and its relation to agreement problems**. Submitted to *Theoretical Computer Science*. (With C. Delporte and H. Fauconnier, Université Paris 7–, and S. Rajsbaum, UNAM, Mexico.)

[R161] A simple object that spans the whole consensus hierarchy. Submitted to *Parallel Processing Letters*. (With A. Mostéfaoui and M. Perrin).

[R162] **Vertex coloring with communication constraints in synchronous broadcast networks.** Submitted to *Journal of Parallel and Distributed Systems*. (With Lakhlef H. and Taïani F.)

[R163] Extending causal consistency to any object defined by a sequential specification. (With A. Mostéfaoui and M. Perrin).

[R164] A speculation-friendly binary search tree. Submitted to *IEEE Transactions on Parallel and Distributed Systems*, (With Crain T. and Gramoli V., University of Sydney, Australia).

[R165] Implementing snapshot objects on top of crash-prone asynchronous message-passing systems. Submitted to *IEEE Transactions on Parallel and Distributed Systems*, (With C. Delporte and H. Fauconnier –Paris 7–, and S. Rajsbaum, UNAM, Mexico.)

[R166] **Beyond linearizability and up to tasks.** (With A.Castañeda and S. Rajsbaum, UNAM, Mexico.)

[R167] Borowsky-Gafni simulation in message-passing systems prone to crash and Byzantine failures. (With D. Imbs and J. Stainer.)

F   Papers in conferences

A ratio a/n appearing after a title means that a papers were accepted from a total of n submissions. As for journals, titles of the papers I consider as the most important are in bold characters.

[C1] Minimizing command language in a system based on a high level language. *IFIP Conference on Command Languages*, *North-Holland 1975*, pp. 117-135, Lund (Sweden), 1974 (with D. Herman, L. Trilling, J.-P. Verjus).

[C2] A standard prelude for a multi-user operating system based on Algol 68. *Int'l Conference on Algol 68,*n pp. 190-202, Stillwater (Oklahoma) 1975 (with Y. Bekkers, D. Herman, J.-P. Verjus).

[C3] Communication between processes and the process management in SAR. *Conference on Experience with Algol 68*, Liverpool (U.K.) 1975 (with Y. Bekkers, D. Herman, J.-P. Verjus).

[C4] Faults and remedies of compile-time protection methods. *5th Annual IFIP W.G.2.1 Conference on the Implementation and the Design of Algorithmic Languages*, pp. 102-110, Guidel (France), 1977 (with Y. Bekkers, Ph. Darondeau).

[C5] A model of inter-context control transfer. *7th Congress of the Gesellschatft für Informatik*, Springer, 1977 (with Ph. Darondeau, T. Muntean).

[C6] Types abstraits et pluralité de leurs représentations à l'exécution. *3ème Colloque International sur la programmation*, Paris, *Dunod*, pp. 263-278, 1978 (with M. Banatre, A. Couvert, D. Herman).

[C7] Présentation et évaluation du projet SOC : Un système d'objets conservés typés. *Actes du Congrès AFCET*, Gif-sur-Yvette, *Ed. Hommes et Techniques*, pp. 446-456, 1978 (with M. Banatre, A. Couvert, D. Herman).

[C8] Abstract specification of communication systems. *Proc. 1st IEEE Int'l Coference on Distributed Computing Systems*, Huntsville, (Alabama) pp. IEEEE Computer Press, pp. 339-346, 1979 (with Ph. Darondeau, P. Le Guernic).

[C9] Synchronisation and protection features for data abstraction. *Proc. 10th Congress Gesellschatft für Informatik*, Springer, pp. 277-291, Saarbrucken (RFA), 1980 (with D. Herman).

[C10] Éléments d'un langage adapté à la communication entre processus. *Actes du congrès AFCET-Informatique*, Nancy, *Ed. Hommes et Techniques)*, pp.667-676, 1980 (with P. Le Guernic).

[C11] Un exercice dans la conception d'un programme en termes de processus coopérants. *Actes du congrès AFCET-Informatique*, pp. 117-126, Gif sur Yvette, 1981.

[C12] **Detection of stable properties in distributed applications.** (25/128). *Proc. 6th ACM Sigact-Sigops Symposium on Principles of Distributed Computing (PODC'87)*, ACM Press, pp. 125-136, 1987 (with J.-M. Hélary, C. Jard, N. Plouzeau).

[C13] An algorithm to detect token loss on a logicial ring and to regenerate lost tokens. *Int'l Conference on Parallel Processing and Applications*, l'Aquila (Italy), North-Holland, *Parallel Processing and Applications*, pp. 457-467, 1987 (with G. Rubino).

[C14] The rudiments of object distribution in a distributed system. Invited Talk. *2nd Int'l Conference on Computer and Information Sciences*, Istanbul, *Nova Science Pub.*, New York, 1988 (with C. Jard).

[C15] General and efficient decentralized consensus protocols. *2nd Int'l Workshop on Distributed Algorithms (WDAG)*, Springer LNCS 312, pp. 41-57, 1987 (with J.-C. Bermond, J.-C. Konig).

[C16] Controlling information transfers in distributed applications, application to deadlock detection. *Int'l Conference on Parallel Processing and Applications*, l'Aquila (Italy), North-Holland, *Parallel Processing and Applications*, pp. 85-92, 1987 (with J.-M. Hélary A. Maddi).

[C17] Depth-first traversal and virtual ring construction in distributed parallel systems. *Proc. IFIP WG 10.3 Conference on Parallel Processing*, North-Holland, *Parallel Processing*, pp. 333-346, Pisa (Italy), 1988 (with J.-M. Hélary).

[C18] Les parcours répartis de réseaux : un outil pour la conception de protocoles. *CFIP 88, (Conference Francophone sur l'Ingénierie des protocoles)*, Bordeaux, *Eyrolles*, pp. 159-170, 1988 (with J.-M. Hélary).

[C19] Assigning distinct identities to sites of an anonymous distributed system. *Proc. IEEE Conference on Future of Distributed Computing Systems (FTDCS)*, IEEE Computer Press, pp. 82-86, Hong-Kong, 1988 (with J.-M. Hélary).

[C20] The meaning of synchronous distributed algorithms run on asynchronous distributed systems. *Proc. 3rd Int'l Symposium on Computers and Information Sciences*, (1988), Izmir (Turkey) *Nova Science Pub. Ed.*, New York, pp. 307-316, 1989 (with M. Adam, Ph. Ingels).

[C21] Experimentation on a parallel machine is helpful to analyse distributed algorithms. *Proc. Int'l Workshop on Parallel and Distributed Algorithms*, Bonas (France), North-Holland, pp. 243-250, 1989 (with M. Adam, Ph. Ingels, Cl. Jard, J.-M. Jézéquel).

[C22] Distributed algorithms: their nature and the problems encountered. *Proc. Int'l Workshop on Parallel and Distributed Algorithms*, Bonas (France), North-Holland, pp. 179-185, 1989.

[C23] Characterization of a particular class of distributed snapshots. *Proc. Int'l Conference on Computing and Information*, North-Holland *Computing and Information*, Toronto (Canada), 1989 (with J.-M. Hélary, N. Plouzeau).

[C24] Vers une problématique de l'algorithmique répartie, Invited Talk. *Colloque Franco-Brésilien sur les Systèmes Répartis*, Florianopolis (Brazil), 1989.

[C25] Distribution of a global invariant in a parallel distributed system. *Parallel Computing 89*, Leiden (Holland), North-Holland, pp. 597-602, 1989.

[C26] Distributed computers in the design and analysis of distributed algorithms. *1st European Workshop on Hypercube and Distributed Computers*, Rennes, (France), *North-Holland*, 1989.

[C27] Computing particular snapshots in distributed systems. (110/354).
Proc. 9th Int'l IEEE Phœnix Conference on Computers and Communications, IEEE Computer press, pp. 116-123, Scottsdale (Arizona) 1990 (with J.-M. Hélary, N. Plouzeau).

[C28] Order notions and atomic multicast in distributed systems. *Proc. 2d IEEE Int'l Conference on future trends of Distributed Computing Systems (FTDCS)*, IEEE Computer Press pp. 420-427, Cairo (Egypt), 1990.

[C29] Implementation and evaluation of distributed synchronization on distributed memory parallel machines. (48/102). *2nd European Conference on Distributed Memory Computing EDMCC2*, Springer LNCS 487, pp. 304-314, Munich (Germany), 1991 (with A. Couvert, R. Pédrono).

[C30] **A distributed solution to the k out of m resources allocation problem.** (60/166). *Proc. Int'l Conference on Computing and Information (ICCI'91)*, Springer LNCS 497, pp. 509-522, Ottawa (Canada), 1991.

[C31] Implementing semaphores on a distributed memory parallel machine. *Proc. Parallel Computing 91*, North-Holland, pp. 407-412, London (UK), 1991.

[C32] Implementation of a distributed debugger for Estelle programs. *Proc. of the ERCIM Workshop on Distributed Systems*, pp. 47-51, Lisboa (Portugal), 1991 (with M. Hurfin, N. Plouzeau).

[C33] **A general method to define quorums.** (85/301). *Proc. 12th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'92)*, IEEE Computer Press, pp. 657-664, Yokohama (Japan), 1992 (with M. Mizuno, M. Neilsen).

[C34] Synchronization and concurrency measures for distributed computations. (85/301). *Proc. 12th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'92)*, IEEE Computer Press, pp. 700-709, Yokohama (Japan), 1992 (with M. Mizuno, M. Neilsen).

[C35] EREBUS: a debugger for asynchronous distributed computations. *Proc. 3rd IEEE Conference on future trends in Distributed Computing Systems (FTDCS'92)*, IEEE Computer Press, pp. 93-98, Taipei (Taiwan), 1992 (with M. Hurfin, N. Plouzeau).

[C36] FLORIA: a distributed kernel for virtual time driven applications. *4th Int'l Conference on Computing and Information (ICCI'92)*, IEEE Computer Press, pp. 457-460, Toronto (Canada), 1992 (with Ph. Ingels, C. Mazeiro).

[C37] Distributed evaluation: a tool for constructing distributed programs. *Int'l Symposium on Theory of Computing and Systems*, Springer LNCS 601, pp. 184-194, (Rodeh, Galil, Dolev Eds), Haifa (Israel), 1992 (with J.-M. Hélary).

[C38] Discrete event simulation on distributed memory parallel machines. *Proc. Workshop on Advances in Parallel Algorithms*, IOS Press, Sofia, pp. 176-183, 1992 (with C. Mazeiro).

[C39] From distributed mutual exclusion to readers and writers algorithms. *Proc. 7th Int'l Conference ISCIS*, Antalya (Turkey), pp. 129-136, 1992.

[C40] Que peut apporter l'algorithmique répartie lorsque l'on est confronté aux défaillances. Invited Talk. *Congrès AFCET 93*, Tome *Sécurité et Sûreté Informatiques*, pp.69-78, Versailles (France), 1993.

[C41] Concepts et problèmes de l'algorithmique répartie. Invited Talk. *Congrès AFCET 93*, Tome *Fondements du parallélisme*, pp.1-15, Versailles (France), 1993.

[C42] **Termination detection in a very general distributed computing model.** (63/299). *13th IEEE Int'l Conference on Distributed Computing Systems (ICDCS)*, IEEE Computer Press, pp. 374-382, Pittsburgh, 1993 (with J. Brzezinsky -Poznan university-, J.-M. Hélary).

[C43] **Detecting atomic sequences of predicates in distributed computations.** (16/57). *Proc 3rd ACM Conference on Parallel and Distributed. Debugging*, ACM SIGPLAN Notices 28(12):33-42, San Diego (CA), 1993 (with M. Hurfin, N. Plouzeau).

[C44] **How to find his way in the jungle of consistency criteria for distributed object memories (or how to escape from Minos' labyrinth)**. *Proc. 4th IEEE Conference on Future Trends of Distributed Computing Systems (FTDCS)*, IEEE Computer Press, pp. 340-346, Lisboa (Portugal), 1993. (with M. Mizuno).

[C45] Causal multicast in overlapping groups: towards a low cost approach. *Proc. 4th IEEE Conference on Future Trends of Distributed Computing Systems (FTDCS)*, IEEE Computer Press, pp. 136-142, Lisboa (Portugal), 1993. (with A. Mostefaoui).

[C46] **Specification and Verification of Behavioral Patterns in Distributed Computations.** (21/95). *Proc. 4th Int'l IFIP WG 10.4 Conference on Dependable Computing for Critical Applications (DCCA 4)*, Springer series on Dependable Computing and Fault-Tolerant Systems, Vol. 9, pp.271-290, San Diego (CA), 1994 (with O. babaoğlu - University of Bologna-).

[C47] Definition and Implementation of a Flexible Communication Primitives for Distributed Programming. (32/79). *Proc. Int'l IFIP WG 10.3 Conference on Applications in Parallel and Distributed Computing*, North-Holland, pp. 115-124, Caracas (Venezuela), 1994 (with A. Mostefaoui).

[C48] An Efficient Implementation of Sequentially Consistent Distributed Shared Memories. (32/79). *Proc. Int'l IFIP WG 10.3 Conference on Applications in Parallel and Distributed Computing*, North-Holland, pp. 145-154, Caracas (Venezuela), 1994 (with M. Mizuno, G. Singh, M. Neilsen -University of Kansas-).

[C49] On granularity of events in distributed computations. <u>Invited Talk</u>. *Proc. Workshop on Specification of Parallel programs*, DIMACS Series in Discrete Mathematics and Theoretical Computer Science (K.M. Chandy and G. Blelloch Eds), 18:115-124, Princeton, 1994 (with M. Hurfin, N. Plouzeau).

[C50] La mise au point des programmes répartis: un problème, quelques solutions. <u>Invited Talk</u>. *7mes Journées Internationales des Sciences Informatiques)*, pp. 283-302, Tunis, 1994.

[C51] On-the-fly replay: a practical paradigm and its implementation for distributed debugging. (59/197). *Proc. 6th IEEE Int'l Symposium on Parallel and Distributed Processing (SPDP)*, IEEE Computer Press, System Track, pp. 266-272, Dallas (TX), 1994 (with M. Hrfin, N. Plouzeau, O. Gerstel, S. Zaks -Technion-).

[C52] **Inevitable global states: a concept to detect unstable properties of distributed computations**. (59/197). *6th IEEE Int'l Symposium on Parallel and Distributed Processing (SPDP)*, IEEE Computer Press, Theory Track, pp. 242-248, Dallas (TX), 1994 (with E. Fromentin).

[C53] On the fly testing of regular patterns in distributed computations. (28/118). *Proc. 23th Int'l Conference on Parallel Processing (ICPP)*, Vol.II, pp. 73-78, Pennsylvania State University, Illinois, 1994 (with E. Fromentin, V. Garg, A. Tomlinson -Austin-).

[C54] Sequential Consistency in Distributed Systems. <u>Invited Talk</u>. *Int'l Workshop on Theory and Practice in DIStributed Systems*, Springer LNCS 938, pp. 224-243, Dagstuhl (Germany), 1994 (with M.Mizuno, J. Zhou).

[C55] Analyzing and Debugging Distributed Executions. <u>Invited Talk</u>. *Proc. Int'l Conference Parallel and Distributed Computing*, KU Press, pp. 13-25, Koweit City, 1995.

[C56] **Characterizing and Detecting the set of Global States seen by all the Observers of a Distributed Computation**. (60/170). *Proc. 15th Int'l IEEE Conference on Distributed Computing. Systems*, IEEE Computer Press, pp. 431-438, Vancouver (Canada), 1995 (with E. Fromentin).

[C57] A look at replaying techniques for distributed executions. <u>Invited Talk</u>. *Proc. 2d Int'l Workshop on Automated and Algorithmic Debugging*, Saint-Malo (France), 1995 (with N. Plouzeau).

[C58] Properties of communication modes in distributed systems. (74/165). *Proc. IEEE Conference on Algorithms and Architectures for Parallel Processing (ICA3P2)*, IEEE Compute Press, pp. 501-505, Brisbane (Australia), 1995 (with R.Baldoni).

[C59] An Introduction to the Analysis and Debug of Distributed Computations. (74/165). *Proc. IEEE Conference on Algorithms and Architectures for Parallel Processing (ICA3P2)*, IEEE Compute Press, pp. 545-554, Brisbane (Australia), 1995 (with E. Fromentin, N. Plouzeau).

[C60] A general definition of deadlocks for distributed systems. (74/165). *Proc. ACM-IEEE Conference on Algorithms and Architectures for Parallel Processing (ICA3P2)*, IEEE Compute Press, pp. 324-332, Brisbane (Australia), 1995 (with J. Brzezinski -Poznan university-, J.-M. Hélary).

[C61] Recognition of Patterns on Control Flows for Debugging Distributed Executions. *Proc. 2d Int'l Workshop on Automated and Algorithmic Debugging* (AADEBUG), Saint-Malo (France) 1995 (with E. Fromentin, C. Jard, G.V. Jourdan).

[C62] Debugging distributed executions using language recognition. (20/90). *Proc. 24th Int'l Conference on Parallel Processing (ICPP)*, *Pennsylvania State University*, Vol. II pp.55-62 (Software Track), Oconomowoc (WI), 1995 (with O. Babaoglu -University of Bologna-, E. Fromentin).

[C63] Efficient Causally Ordered Communications for Multimedia Real-Time Applications. (20/68). *Proc. 4th IEEE Int'l Symposium on High Performance Distributed Computing (HPDC)*, IEEE Computer Press, pp.140-147, Washington DC, 1995 (with R. Baldoni, A. Mostefaoui).

[C64] Deadlocks in distributed systems: request Models and Definitions. <u>Invited Talk</u>. *Proc. 5th IEEE Int'l Conference on Future Trends of Distributed Computing Systems (FTDCS)*, IEEE Computer Press, pp. 186-193, Cheju (South Korea), 1995 (with J. Brzezinski -Poznan university-, J.-M. Hélary).

[C65] Modeling consistent checkpoints and the domino effect in large scale distributed systems. *Proc. 5th IEEE Int'l Conference on Future Trends of Distributed Computing Systems (FTDCS)*, IEEE Computer Press, pp. 314-323, Cheju (South Korea), 1995 (with R. Baldoni, J. Brzezinski -Poznan university-, J.-M. Hélary, A. Mostefaoui).

[C66] **Expressing and Detecting Control Flows Properties of Distributed Computations**. (99/249). *Proc. 7th Int'l IEEE Symposium on Parallel and Distributed Processing (SPDP)*, IEEE Computer Press, pp. 432-438, San Antonio, (TX), 1995 (with E. Fromentin, V. Garg).

[C67] **From causal consistency to sequential consistency in shared memory systems.** *Proc. 15th Int'l Conference on Foundations of Software Technology and Theoretical Computer Science (FST&TCS)*, Springer LNCS 1026, pp. 180-194, Bangalore (India), 1995 (with A. Schiper).

[C68] A synchronization measure for communication modes in distributed systems. *Proc. 14th Int'l Conference on Applied Informatics*, pp. 204-207, Innsbruck (Austria), 1996 (with R. Baldoni, G. Cioffi -University of Roma-).

[C69] Causal multicast in unreliable networks for multimedia applications. *15th IEEE Int'l Phoenix Conference on Computers and Communications*, IEEE Computer Press, pp. 51-57, Phoenix (AZ) 1996 (with R. Baldoni, A. Mostefaoui).

[C70] An informal introduction to distributed algorithms. Invited Talk. *Int'l Conference on Distributed systems*, Salvador de Bahia (Brazil), 1996.

[C71] **An efficient causal ordering algorithm for mobile computing environment**. (86/295). *Proc. 15th IEEE Int'l Conference on Distributed Computing Systems (ICDCS)*, IEEE Computer Press, pp. 744-751, Hong-Kong, 1996 (with M. Singhal, R. Prakash -Ohio state university-).

[C72] Quorum-based solutions to the h out of k mutual exclusion problem. *4th Int'l Workshop on Parallel Systems and Algorithms (PASA4)*, World Scientific Pub., Lubeck (Germany) 1996 (with R. Baldoni, Y. Manabe -ntt, Japan-).

[C73] Broadcast with time and causality constraints for multimedia applications. *22d EUROMICRO Conference*, IEEE Computer Press, pp.617-624, Pragua (Czech Republic), 1996 (with R. Baldoni, M. Singhal, R. Prakash -Ohio state university-).

[C74] Weakening transactions to fit the need of cooperative applications. *Int'l Conference on Information, Systems, Analysis and Synthesis (ISAS)*, pp.531-538, Orlando (FL), 1996 (with G. Thia-kime).

[C75] Detecting diamonds necklaces in labeled directed acyclic graphs (a problem from distributed debugging. *22th Int'l Workshop on Graph Theoretic Concepts in Computer Science*. Springer LNCS 1197, pp. 211-223, Lago di Como (Italy), 1996 (with M. Hurfin).

[C76] Reducing the number of messages logged in uncoordinated checkpointing algorithms. (26/76). *2d European Dependable Computing Conference (EDCC2)*, Springer LNCS 1150, pp.353-364, Taormina (Italy), 1996 (with A. Mostefaoui).

[C77] Efficient distributed detection of conjunction of local predicates in asynchronous computations. (81/217). *Proc. 8th Int'l IEEE Symposium on Parallel and Distributed Processing (SPDP)*, IEEE Computer Press, pp. 588-594, New-Orleans, October 1996 (with M. Hurfin, M. Mizuno, M. Singhal).

[C78] A suite of formal definitions for consistency criteria in distributed shared memories. *Proc. 9-th Int'l IEEE Conference on Parallel and Distributed Computing Systems (PDCS)*, IEEE Computer Press, pp. 125-131, Dijon (France), 1996 (with A. Schiper).

[C79] Static and dynamic adaptation of transactional consistency. (70/180). *Proc. 30th International Conference on Systems Sciences (HICSS)*, Vol I, pp. 533-542, Maui (Hawai), 1997 (with O. Theel).

[C80] Consistent State Restoration in Shared Memory Systems. (59/167). *Proc. Int'l IEEE Conference on Advances in Parallel and Distributed Computing (APDC)*, IEEE Computer Press, pp. 330-337, Shanghai (China), 1997 (with R. Baldoni, A. Mostefaoui).

[C81] Real-time dependable decisions in timed asynchronous distributed systems. *Proc. 3rd Int'l IEEE Workshop on Object-Oriented Real-time Distributed Systems (WORDS)*, IEEE Computer Press, pp. 283-290, Newport Beach (CA) 1997.

[C82] Revisiting the non-blocking atomic commitment problem in distributed systems. Invited Talk. *Proc. 2d IPPS IEEE Workshop on Fault-Tolerant Parallel and Distributed Systems*, IEEE Computer Press, pp. 116-133, Genve (Switzerland), 1997.

[C83] **A communication-induced checkpointing protocol that ensures the rollback-dependency trackability property**. (42/122). *27th IEEE Symposium on Fault-Tolerant Computing Systems (FTCS)*, IEEE Computer Press, pp. 68-77, Seattle (WA), 1997 (with R. Baldoni, J.-M. Hélary, A. Mostefaoui).

[C84] From serializable to causal transactions for collaborative applications. *23th EUROMICRO Conference*, IEEE Computer Press, pp. 314-321, Budapest (Hungary), 1997 (with G. Thiakime, M. Ahamad -Georgia Tech-).

[C85] **Preventing useless checkpoints in distributed computations**.(20/72). *16th IEEE Symposium on Reliable Distributed Systems (SRDS)*, IEEE Computer Press, pp. 183-190, Durham (VG), 1997 (with J.-M. Hélary, A. Mostefaoui, R. Netzer).

[C86] A case study of Agreement Problems in Distributed Systems. *Proc. 2d Int'l IEEE Workshop on High Assurance Systems Engineering (HASE)*, IEEE Computer Press, pp. 156-164, Washington DC, 1997.

[C87] **Virtual precedence in asynchronous systems: concept and applications**. (20/59). *11th Int'l Workshop on Distributed Algorithms (WDAG)*, Springer LNCS 1320, pp. 170-184, Saarbrucken (Germany), 1997 (with J.-M. Hélary, A. Mostefaoui).

[C88] Implementing train applications based on the distributed shared memory paradigm. *Proc. 14th IFIP/IFAC Int'l Conference on Distributed Computer Control Systems (DCCS)*, pp. 191-196, Seoul (South Korea), 1997 (with G. Bae, G. Thiakime).

[C89] Cycle prevention in distributed checkpointing. Invited Talk. *Proc. Int'l symposium On Principles Of DIstributed Systems (OPODIS)*, Hermès pp. 309-318, Chantilly (France), 1997, (with J.-M. Hélary, A. Mostefaoui).

[C90] Exploiting write semantics in implementing partially replicated causal objects. (28/89). *Proc. 6th EUROMICRO Conference on Parallel and Distributed Processing (PDP'98)*, IEEE Computer Press, pp. 157-163, Madrid (Spain), 1998.

[C91] A practical building block for solving agreement problems in asynchronous distributed systems. *Proc. 17th IEEE Int'l Performance, Computing and Communications Conference*, IEEE Computer Press, pp. 25-31, Phoenix (AZ), 1998 (with M. Hurfin, F. Tronel).

[C92] Asynchronous protocols to meet real-time constraints: is it really sensible? How to proceed? Invited Talk. *Proc. First Int'l IEEE Symposium on Object-Oriented Real-Time Distributed Computing (ISORC)*, IEEE Computer Press, pp. 290-297, Kyoto (Japan), 1998 (with M. Hurfin).

[C93] An adaptive protocol for implementing causally consistent distributed services. (68/305). *18th IEEE Int'l Conference on DIStributed Computing Systems (ICDCS)*, IEEE Computer Press, pp. 86-93, Amsterdam (Netherlands), 1998 (with M. Ahamad, G. Thiakime).

[C94] **Communication-induced determination of consistent snapshots**. (47/199). *28th IEEE Int'l Symposium on Fault-Tolerant Computing (FTCS*, IEEE Computer Press, pp. 208-217, Munich (Germany), 1998 (with J.-M. Hélary, A. Mostefaoui).

[C95] **Fault-tolerant total order multicast for asynchronous groups**. *17th IEEE Symposium on Reliable Distributed Systems, (SRDS)*, IEEE Computer Press, pp. 228-234, Purdue, 1998 (with U. Fridzke, Ph. Ingels, A. Mostefaoui).

[C96] Consensus in asynchronous systems where processes can crash and recover. *17th IEEE Symposium on Reliable Distributed Systems, (SRDS)*, IEEE Computer Press, pp. 280-286, Purdue, 1998 (with M. Hurfin, A. Mostefaoui).

[C97] Lifetime-based consistency for distributed objects. (28/87). *12th Int'l Symposium on DIStributed Computing (DISC), (Previously WDAG)*, Springer LNCS 1499, pp. 378-392, Andros (Greece), 1998 (with M. Ahamad, F. Torres -Georgia Tech-).

[C98] Probabilistic Analysis of a Group Failure Detection Protocol. *Proc. 4th Int'l IEEE Workshop on Object-Oriented Real-time Distributed Systems (WORDS 99)*, IEEE Computer Press, pp. 156-162, Santa Barbara (CA), 1999 (with R. Bollo, J.-P. Le Narzul, F. Tronel).

[C99] Rollback Dependency Trackability: Visible Characterizations. (27/95). *18th ACM SIGACT-SIGOPS Int'l Symposium on Principles of Distributed Computing (PODC'99)*, ACM Press, pp. 33-42, Atlanta, 1999 (with R. Baldoni, J.-M. Hélary).

[C100] **Timed Consistency for Shared Distributed Objects**. (27/95). *18th ACM SIGACT-SIGOPS Int'l Symposium on Principles of Distributed Computing (PODC'99)*, ACM Press, pp. 163-172, Atlanta, 1999 (with M. Ahamad, F. Torres -Georgia Tech-).

[C101] **On Classes of Problems in Asynchronous Distributed Systems with Process Crashes**. Best Paper Award (57/173). *19th IEEE Int'l Conference on Distributed Computing Systems (ICDCS)*, IEEE Computer Press, pp. 470-477, Austin (TX), 1999 (with E. Fromentin, F. Tronel).

[C102] Logical clocks for unreliable process groups. *Int'l Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'99)*, pp. 2272-2278, Las Vegas (NV), 1999 (with A. Mostefaoui).

[C103] Efficient Logically Instantaneous Communications in Asynchronous Distributed Systems. (47/103). *5th Int'l Conference on Parallel Computing Technologies (PaCT'99)*, Springer LNCS 1662, pp. 258-270, St-Petersburg (Russia), 1999 (with A. Mostefaoui, P. Verissimo).

[C104] Consistent Lamport's clocks for asynchronous groups with process crashes. (47/103). *5th Int'l Conference on Parallel Computing Technologies (PaCT'99)*, Springer LNCS 1662, pp. 98-107, St-Petersburg (Russia), 1999 (with A. Mostefaoui, M. Takizawa -Tokyo-).

[C105] Illustrating the Use of Vector Clocks in Property Detection: an Example and a Counter-Example. (115(*regular papers*)/341). *Proc. 5th Int'l European Parallel Computing Conference (EUROPAR'99)*, Springer LNCS 1685, pp. 806-814, Toulouse (France), 1999.

[C106] Consistent checkpointing for distributed databases. (115 (*regular papers*)/341). *Proc. 5th Int'l European Parallel Computing Conference (EUROPAR'99)*, Springer LNCS 1685, pp. 450-458, Toulouse (France), 1999 (with R. Baldoni, F. Quaglia -University of Roma-).

[C107] A general framework to solve agreement problems. (26/61). *18th IEEE Symposium on Reliable Distributed Systems, (SRDS'99)*, IEEE Computer Press, pp. 56-67, Lausanne (Switzerland), 1999 (with M. Hurfin, R. Macedo, F. Tronel).

[C108] Simple Vector Clocks are Limited to Solve some Causality-Related Problems. Invited talk. *Proc. Int'l Symposium On Principles Of DIstributed Systems (OPODIS'99)*, pp. 199-208, Hanoi (Vietnam) 1999.

[C109] Direct dependency-Based Determination of Consistent Global Checkpoints. *Proc. Int'l Symposium On Principles Of DIstributed Systems (OPODIS'99)*, pp. 11-28, Hanoi, Vietnam, 1999 (with R. Baldoni, G. Cioffi, J.-M. Hélary).

[C110] **Solving Consensus Using Chandra-Toueg's Unreliable Failure Detectors: a General Quorum-Based Approach**. (23/60). *Proc. 13th Int'l Symposium on Distributed Computing (DISC'99)*, Springer LNCS 1693, pp. 49-63, (P. Jayanti Ed.), Bratislava (Slovaquia), 1999 (with A. Mostefaoui).

[C111] Unreliable failure Detector with Limited Scope Accuracy and an Application to Consensus. (30/84). *Proc. 19th Int'l Conference on Foundations of Software Technology and Theoretical Computer Science (FST&TCS)*, Springer LNCS 1738, pp. 329-340, Chennai (India), 1999 (with A. Mostefaoui).

[C112] **Computing Global Functions in Asynchronous Distributed Systems with Process Crashes**. (76/187). Best Paper Award. *20th IEEE Int'l Conference on Distributed Computing Systems (ICDCS)*, IEEE Computer Press, pp. 584-591, Taipei (Taiwan), 2000 (with J.-M. Hélary, M. Hurfin, A. Mostefaoui, F. Tronel).

[C113] Atomic Broadcast in Asynchronous Crash-Recovery Distributed Systems. (76/187). *20th IEEE Int'l Conference on Distributed Computing Systems (ICDCS)*, IEEE Computer Press, pp. 288-295, Taipei (Taiwan), 2000 (with L. Rodrigues -Lisbon-).

[C114] Deadline-Constrained Causal Order. *Proc. Third Int'l IEEE Symposium on Object-Oriented Real-Time Distributed Computing (ISORC)*, IEEE Computer Press, pp. 234-241, Newport Beach (CA), 2000 (with E. Anceaume, R. Baldoni, L. Rodrigues).

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[C115] Consensus Based on Failure Detectors with a Perpetual Weak Accuracy Property. (107/303). *Proc. IEEE Int'l Parallel and Distributed Processing Symposium (IPDPS)*, IEEE Computer Press, pp. .514-519, Cancun (Mexico), 2000 (with A. Mostefaoui).

[C116] Consensus Based on Strong Failure detectors: Time and Message Efficient Protocol. *Proc. Int'l Workshop on Fault-Tolerant Parallel and Distributed Systems, (in conjunction with the Int'l IEEE Conference on Parallel and Distributed Processing Symposium -IPDPS-)*, Springer, LNCS 1800, pp. 1258-1267, Cancun (Mexico), 2000 (with F. Greve, A. Mostefaoui, R. Macedo).

[C117] The best of both worlds: a hybrid approach to solve consensus. *Int'l IEEE/IFIP Conference on Dependable Systems and Networks (previously IEEE Symposium on Fault-Tolerant Systems)*, IEEE Computer Press, pp. 513-522, New York, 2000 (with A. Mostefaoui, F. Tronel).

[C118] From crash fault-tolerance to Byzantine fault-tolerance: towards a modular approach. *Int'l IEEE/IFIP Conference on Dependable Systems and Networks (previously IEEE Symposium on Fault-Tolerant Systems)*, IEEE Computer Press, pp. 273-282, New York, June 2000 (with R. Baldoni, J.-M. Hélary).

[C119] Consensus in Byzantine Asynchronous Distributed Systems. *7th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO)*, Carleton University Press, pp. 1-15, L'Aquila (Italy) 2000 (with R. Baldoni, J.-M. Hélary, L. Tanguy).

[C120] Tracking Causality in Distributed Systems: a Suite of Efficient Protocols. *7th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO)*, Carleton University Press, pp. 181-195, L'Aquila (Italy), 2000 (with J.-M. Hélary, G. Melideo).

[C121] k-**Set Agreement and Limited Accuracy Failure Detectors**. *19th ACM SIGACT-SIGOPS Int'l Symposium on Principles of Distributed Computing (PODC'00)*, ACM Press, pp. 143-152, Portland (OR), 2000 (with A. Mostefaoui).

[C122] Quorum-Based Replication in Asynchronous Crash-Recovery Distributed Systems. (167/326). *Proc. 6th Int'l European Parallel Computing Conference (EUROPAR'00)*, Springer LNCS 1900, pp. 554-558, Munich (Germany), 2000 (with L. Rodrigues).

[C123] Logical Instantaneity and Causal Order: Two First Class Communication Modes for Parallel Computing. Invited Talk. *Proc. 6th Int'l European Parallel Computing Conference (EUROPAR)*, Springer LNCS 1900, pp. 13-20, Munich (Germany), 2000.

[C124] **Low-Cost Consensus-Based Atomic Broadcast**. (21/44). *7th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2000)*, IEEE Computer Press, pp. 45-52, UCLA, Los Angeles (CA), 2000. (with A. Mostefaoui).

[C125] Realtime Based Strong Consistency for Distributed Objects. *Proc. 5th Int'l IEEE Workshop on Object-Oriented Real-time Distributed Systems (WORDS'01)*, IEEE Computer Press, pp. 161-168, Roma (Italy), 2001 (with M. Ahamad, F. Torres -Georgia Tech-).

[C126] Primary component asynchronous group membership as an instance of a generic agreement framework. (48/102). *Proc. 5th IEEE Int'l Symposium on Autonomous Decentralized Systems (ISADS)*, IEEE Computer Press, pp. 93-100, Dallas (TX), 2001 (with F. Greve, M. Hurfin , F. Tronel).

[C127] Shared State Consistency for Time-Sensitive Distributed Applications. (72/210). Best paper award. *21th IEEE Int'l Conference on Distributed Computing Systems (ICDCS)*, IEEE Computer Press, pp. 606-614, Phoenix (AZ), 2001 (with V. Krishnaswamy, M. Ahamad, D. Bakken -Georgia Tech-).

[C128] A Condition for k-Set Agreement in Asynchronous Distributed Systems. (48/276). *Proc. IEEE Int'l Parallel and Distributed Processing Symposium (IPDPS'01), (15th IPPS/12th SPDP)*, IEEE Computer Press, San Francisco (CA), 2001 (with A. Mostefaoui).

[C129] Randomized Multivalued Consensus. *Proc. Fourth Int'l IEEE Symposium on Object-Oriented Real-Time Distributed Computing (ISORC'01)*, IEEE Computer Press, pp. 195-200, Magdeburg (Germany), 2001 (with P. Ezhilchelvan, A. Mostefaoui).

[C130] **Conditions on Input Patterns for Consensus Solvability in Asynchronous Distributed Systems**. (83/230). *33rd ACM Symposium on Theory of Computing (STOC'01)*, ACM Press, pp. 153-162, 2 Crête (Greece), 2001 (En collaboration avec A. Mostefaoui, S. Rajsbaum).

[C131] **Randomized k-Set Agreement**. (34/93). *13th ACM Symposium on Parallel Algorithms and Architectures (SPAA'01)*, ACM Press, pp. 291-297, Crête(Greece), 2001 (with A. Mostefaoui).

[C132] **A Hierarchy of Conditions for Consensus Solvability.** (29/102).
20th ACM SIGACT-SIGOPS Int'l Symposium on Principles of Distributed Computing (PODC'01), ACM Press, pp. 151-160, Newport (RI), 2001 (with A. Mostefaoui, S. Rajsbaum, M. Roy).

[C133] Quiescent Uniform Reliable Broadcast as an Introduction to Failure Detector Oracles. (36/81). *6th Int'l Conference on Parallel Computing Technologies (PaCT'01)*, Novosibirsk, Springer LNCS 2127, pp. 98-111, 2001.

[C134] **Consensus in One Communication Step**. (36/81). *6th Int'l Conference on Parallel Computing Technologies (PaCT'01)*, Novosibirsk, Springer LNCS 2127, pp. 42-50, 2001 (with F. Brasileiro, F. Greve, A. Mostefaoui).

[C135] Efficient Condition-Based Consensus. *8th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'01)*, Carleton University Press, pp. 275-291, Val de Nuria (Catalonia, Spain), 2001(with A. Mostefaoui, S. Rajsbaum, M. Roy).

[C136] Building TMR-Based Reliable Servers Despite Bounded Input Lifetime. *Proc. 7th Int'l European Parallel Computing Conference (EUROPAR'01)*, Springer LNCS 2150, pp. 482-485, Manchester (UK), 2001 (with P. Ezhilchelvan, J.M. Helary).

[C137] A Consensus Protocol Based on a Weak Failure Detector and a Sliding Round Window. (21/65). *20th IEEE Symposium on Reliable Distributed Systems, (SRDS'01)*, IEEE Computer Press, pp. 120-129, New-Orleans, 200 (with M. Hurfin, R. Macedo, A. Mostefaoui).

[C138] An Adaptive Failure Detection Protocol. (33/80). *8th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2001)*, IEEE Computer Press, pp. 146-153, Seoul (South Korea), 2001 (with C. Fetzer, F. Tronel).

[C139] Approximate Real-Time Clocks for Scheduled Events. *Proc. 5th Int'l IEEE Symposium on Object-Oriented Real-Time Distributed Computing (ISORC'02)*, IEEE Computer Press, pp. 53-61, Washington DC, 2002 (with C. Fetzer).

[C140] Wait-Free Objects for Real-Time Systems (Position paper). *Proc. 5th Int'l IEEE Symposium on Object-Oriented Real-Time Distributed Computing (ISORC'02)*, IEEE Computer Press, pp. 413-420, Washington DC, 2002.

[C141] **A Versatile and Modular Consensus Protocol**. (48/156). *Int'l IEEE/IFIP Conference on Dependable Systems and Networks (DSN'02), (previously, FTCS)*, IEEE Computer Press, pp. 364-373, Washington DC, 2002 (with A. Mostefaoui, S. Rajsbaum).

[C142] Ordering vs Timeliness: two Facets of Consistency? <u>Invited Talk</u>. In *Future Directions in Distributed Computing (FuDiCo)*, Springer LNCS 2584, pp. 73-77, Bertinoro (Italy), 2002 (with M. Ahamad).

[C143] Using Error-Correcting Codes to Solve Distributed Agreement Problems: a Future Direction in Distributed Computing? <u>Invited talk</u>. In *Future Directions in Distributed Computing (FuDiCo)*, Springer LNCS 2584, pp. 17-21, Bertinoro (Italy), 2002 (with R. Friedman, A. Mostefaoui, S. Rasjbaum).

[C144] Tracking Immediate Predecessors in Distributed Computations. *14th ACM Symposium on Parallel Algorithms and Architectures (SPAA'02)*, ACM Press, pp. 210-219, Winnipeg (Canada), 2002 (with E. Anceaume, J.M. Helary).

[C145] **Asynchronous Distributed Agreement and its Relation with Error Correcting Codes**.(23/75). *Proc. 16th Int'l Symposium on DIStributed Computing (DISC'02)*, Springer LNCS 2508, pp. 63-87, Toulouse (France), 2002 (with R. Friedman, A. Mostefaoui, S. Rajsbaum).

[C146] The Lords of the Rings: Efficient Maintenance of Views at Data Warehouses. (23/75). *Proc. 16th Int'l Symposium on DIStributed Computing (DISC'02)*, Springer LNCS 2508, pp. 33-47, Toulouse ((France), 2002 (with A. Mostefaoui, M. Roy, A. El Abbadi, D. Agrawal).

[C147] Condition-Based Protocols for Set Agreement Problems. (23/75) *Proc. 16th Int'l Symposium on DIStributed Computing (DISC'02)*, Springer LNCS 2508, pp. 48-62, Toulouse (France), 2002 (with A. Mostefaoui, S. Rajsbaum, M. Roy).

[C148] Sequential Consistency as Lazy Linearizability. (119/300). *Proc. First Eurasia ICT-2002: Information and Communication Technology*, Springer LNCS 2510, pp. 866-873, Shiraz (Iran), 2002.

[C149] An Introduction to the Renaming Problem. (29/63). *9th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2002)*, IEEE Computer Press, pp. 121-124, Tsukuba (Japan), 2002.

[C150] **Consensus in Synchronous Systems: a Concise Guided Tour**. (29/63). *9th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2002)*, IEEE Computer Press, pp. 221-228, Tsukuba (Japan), 2002.

[C151] An Optimal Atomic Broadcast Protocol and Implementation Framework. *8th Int'l IEEE Workshop on Object-Oriented Real-Time Dependable Systems (WORDS'2003)*, IEEE Computer Press, pp. 32-39, Guadalajara (Mexico), 2003 (with P. Ezhilchelvan).

[C152] Reliable Compare&Swap for Fault-Tolerant Synchronization. Invited Talk. *8th Int'l IEEE Workshop on Object-Oriented Real-Time Dependable Systems (WORDS'2003)*, IEEE Computer Press, pp. 50-55, Guadalaraja (Mexico), 2003.

[C153] Token-Based Sequential Consistency in Asynchronous Distributed Systems. (68/219). *17th Int'l IEEE Conference on Advanced Information Networking and Applications (AINA'03)*, IEEE Computer Press, pp. 421-427, Xi'an (China), 2003.

[C154] Uniform Agreement despite Process Omission failures. Invited Talk. *Proc. Int'l Workshop on Fault-Tolerant Parallel and Distributed Systems, (in conjunction with the Int'l IEEE Conference on Parallel and Distributed Processing Symposium (IPDPS'03)*, IEEE Computer Press, Nice (France), 2003 (En collaboration avec PH. RAIPIN PARVEDY.)

[C155] **A Generic Framework for Indulgent Consensus**. (72/406) *23th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'03)*, IEEE Computer Society Press, pp. 88-97, Providence (RI), 2003 (with R. Guerraoui).

[C156] Elastic Vector Time. (72/406). *23th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'03)*, IEEE Computer Press, pp. 284-291, Providence (RI), 2003 (with C. Fetzer).

[C157] Looking for a common view for mobile worlds. *9th IEEE Conference on Future Trends of Distributed Computing Systems (FT DCS'03)*. IEEE Computer Press, pp. 159-165, Porto Rico, 2003 (with M. Gradinariu, G. Simon).

[C158] Nested Invocation Protocol on Object-based Systems. *Proc. 6th Int'l IEEE Symposium on Object-Oriented Real-Time Distributed Computing (ISORC'03)*, IEEE Computer Society Press, Hakodate (Hokkaido, apan), 2003 (with K. Hori, T. Enokido and M. Takizawa -Tokyo-).

[C159] Anonymous Publish/Subscribe in Peer-to-Peer Network Systems. *Proc. IEEE Int'l Parallel and Distributed Processing Symposium (IPDPS'03)*,IEEE Computer Press, Nice (France), 2003 (with A. Datta, M. Gradinariu, G. Simon).

[C160] **Asynchronous Implementation of Failure Detectors**. (45/146). *Int'l IEEE Conference on Dependable Systems and Networks (DSN'03)*, (Track: *Dependable Computing and Communications Symposium*), IEEE Computer Press, pp. 351-360, San Francisco (CA), 2003 (with A. Mostefaoui, E. Mourgaya).

[C161] Evaluating the Condition-Based Approach to solve Consensus. (28/79). *Int'l IEEE Conference on Dependable Systems and Networks (DSN'03)*, (Track: *Performance and Dependability Symposium (IPDS)*), IEEE Computer Press, pp. 541-550, San Francisco (CA), 2003 (with A. Mostefaoui, E. Mourgaya, Ph. Raipin Parvedy).

[C162] The Condition-based Approach in Distributed Computing. Invited talk. *10th Int'l Workshop on Expressiveness in Concurrency (Express'03)*, (Satellite Workshop of *CONCUR'03*), Electronic Notes in Theoretical Computer Science, Vol. 3, p. 79, Marseille (France), 2003.

[C163] A Hierarchy of Conditions for Asynchronous Interactive Consistency. *7th Int'l Conference on Parallel Computing Technologies (PaCT'03)*, Springer LNCS 2763, pp. 130-140, Nizhni Novgorod (Russia), 2003 (with A. Mostefaoui, S. Rajsbaum, M. Roy).

[C164] The Renaming Problem as an Introduction to Structures for Wait-free Computing. *7th Int'l Conference on Parallel Computing Technologies (PaCT'03)*, Springer LNCS 2763, pp. 151-164, Nizhni Novgorod (Russia), 2003.

[C165] Using Conditions to Expedite Consensus in Synchronous Distributed Systems. (25/91). *Proc. 17th Int'l Symposium on DIStributed Computing (DISC'03)*, Springer LNCS 2848, pp. 249-263, Sorrento (Italy), 2003 (with A. Mostefaoui, S. Rajsbaum).

[C166] A Distributed Implementation of Sequential Consistency with Multi-Object Operations. (84/475). *24th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'04)*, IEEE Computer Society Press, pp. 544-551, Tokyo, 2004 (with K. Vidyasankar -Newfoundland University, Canada-).

[C167] A Hybrid Approach for Building Eventually Accurate Failure Detectors. (32/104). *10th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2004)*, IEEE Computer Society Press, pp. 57-65, Papeete (Tahiti, France), 2004 (with A. Mostefaoui, D. Powell).

[C168] **Optimal Early-Stopping Uniform Consensus in Synchronous Systems with Process Omission failures**. *16th ACM Symposium on Parallel Algorithms and Architectures (SPAA'04)*, ACM Press, pp. 302-310, Barcelona (Spain), 2004 (with Ph. Raipin Parvedy)

[C169] **The Synchronous Condition-Based Consensus Hierarchy**. (31/142). *Proc. 18th Int'l Symposium on DIStributed Computing (DISC'04)*, Springer LNCS 3274, pp. 1-15, Amsterdam, 2004 (with A. Mostefaoui, S. Rajsbaum).

[C170] On the Respective Power of $\Diamond \mathcal{P}$ and $\Diamond \mathcal{S}$ to Solve One-Shot Agreement Problems. (31/142). *Proc. 18th Int'l Symposium on DIStributed Computing (DISC'04)*, Springer LNCS 3274, pp. 41-55, Amsterdam, 2004 (with R. Friedman, A. Mostefaoui).

[C171] A Methodological Construction of an Efficient Sequential Consistency Protocol. (26/85). *Proc. 3rd IEEE Int'l Symposium on Network Computing and Applications (NCA'04)*, IEEE Computer Press, pp. 141-148, Kendall Square, Cambridge (MA), 2004 (with V. Cholvi, A. Fernandez, E. Jimenez -Madrid-).

[C172] Simple and Efficient Oracle-Based Consensus Protocols for Asynchronous Byzantine Systems. (27/117). *23th IEEE Symposium on Reliable Distributed Systems (SRDS'04)*, IEEE Computer Press, pp. 228-237, Florianopolis (Brazil), 2004 (with R. Friedman, A. Mostefaoui).

[C173] Crash-Resilient Time-free Eventual Leadership. (27/117). *23th IEEE Symposium on Reliable Distributed Systems (SRDS'04)*, IEEE Computer Society Press, pp. 208-217, Florianopolis (Brazil), O 2004 (with A. Mostefaoui, C. Travers).

[C174] Oracles pour la tolérance aux fautes dans les systèmes répartis. Invited talk. *7ème Colloque Africain sur la Recherche Informatique (CARI'04)*, Hammamet (Tunisie), 2004.

[C175] On the Benefits of the Functional Modular Approach in Distributed Data Management Systems. Invited talk. *Proc. First IEEE Workshop on Dependable Distributed Data Management (WDDDM'04, SRDS'04 satellite workshop)*, IEEE Computer Society Press, pp. 1-6, Florianopolis (Brazil), 2004 (with R. Friedman).

[C176] The Notion of Veto Number for Distributed Agreement Problems. Invited talk. *6th International Workshop on Distributed Computing (IWDC'04, Now ICDCN)*, Springer LNCS 3326, pp. 315-325, Kolkata (India), 2004 (with R. Friedman, A. Mostefaoui).

[C177] A simple protocol offering both atomic consistent read operations and sequentially consistent read operations. *18th Int'l IEEE Conference on Advanced Information Networking and Applications (AINA'05)*, IEEE Computer Press, pp. 961-966, Taipei (Taiwan), March 2005 (with M. Roy, C. Tutu).

[C178] **Building and Using Quorums Despite any Number of Process Crashes**. *5th European Dependable Computing Conference (EDCC'05)*, Budapest (Hungary), Springer LNCS 3463, pp. 2-19, 2005 (with R. Friedman, A. Mostefaoui).

[C179] Mixed Consistency Model: Meeting Data Sharing Needs of Heterogeneous Users. (75/543). *25th IEEE Int'l Conference on Distributed Computing System (ICDCS'05)*, IEEE Computer Press, pp. 209-218, Columbus (Ohio), 2005 (with M. Ahamad, Z. Zhan -Georgia Tech-).

[C180] Building Responsive TMR-Based Servers in presence of Timing Constraints. *Proc. 8th Int'l IEEE Symposium on Object-Oriented Real-Time Distributed Computing (ISORC'05)*, IEEE Computer Press, pp. 267-274, Seattle (WA), 2005 (with P. Ezhilchelvan, J.-M. Hélary).

[C181] A Hybrid and Adaptive Model for Fault-Tolerant Distributed Computing. *Int'l IEEE Conference on Dependable Systems and Networks (DSN'05)*, IEEE Computer Society Press, pp. 412-421, Yokohama (Japan), 2005 (with S. Gorender, R. Macedo -Salvador de Bahia-).

[C182] Early-stopping k-set agreement in synchronous systems prone to any number of process crashes. *8th Int'l Conference on Parallel Computing Technologies (PaCT'05)*, Krasnoyarsk (Russia), Springer LNCS 3606, pp. 49-58, 2005 (with P. Raipin Parvedy, C. Travers).

[C183] Allowing atomic objects to coexist with sequentially consistent objects.
8th Int'l Conference on Parallel Computing Technologies (PaCT'05), Krasnoyarsk (Russia), Springer LNCS 3606, pp. 59-73, Sept. 2005. (En collaboration avec M. Roy.)

[C184] **The Combined Power of Conditions and Failure Detectors to Solve Asynchronous Set Agreement**. (36/160). *24th ACM SIGACT-SIGOPS Int'l Symposium on Principles of Distributed Computing (PODC'05)*, ACM Press, pp. 179-188, Las Vegas (NV), 2005 (with A. Mostefaoui, S. Rajsbaum).

[C185] From Static Distributed Systems to Dynamic Systems. (20/67).
24th IEEE Symposium on Reliable Distributed Systems (SRDS'05), IEEE Computer Society Press, pp. 109-119, Orlando (FL), 2005 (with A. Mostefaoui, C. Travers, S. Peterson, A. El Abbadi, D. Agrawal (-UCSB-).

[C186] Intersecting Sets: a Basic Abstraction for Asynchronous Agreement Problems. (38/105). *11th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2005)*, IEEE Computer Press, pp. 15-22, Changsha (Hunan), (China), 2005 (with R. Friedman, A. Mostefaoui).

[C187] Decision Optimal Early-stopping k-set agreement in synchronous systems prone to send omission failures. (38/105). *11th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2005)*, IEEE Computer Society Press, pp. 23-30, Changsha (Hunan), (China), 2005 (with P. Raipin Parvedy, C. Travers).

[C188] A Note on a simple equivalence between round-based synchronous and asynchronous models. (38/105). *11th IEEE Pacific Rim Int'l Symposium on Dependable Computing (PRDC'2005)*, IEEE Computer Society Press, pp. 387-390, Changsha (Hunan), (China), 2005 (with M. Roy).

[C189] Fault-tolerant Techniques for Concurrent Objects. *2nd Latin-American Symposium on Dependable Computing*, Springer LNCS 3747, pp. 265, 2005 (with R. Guerraoui).

[C190] Abstractions for Implementing Atomic Objects in Distributed Systems. (30/109). *9th Int'l Conference on Principles of Distributed Systems (OPODIS'05)*, Springer LNCS 3974, pp. 73-87, Pisa (Italy), D2005 (with R. Friedman, C. Travers).

[C191] A hierarchical consensus protocol for mobile adhoc networks. *14th Euromicro Int'l Conference on Parallel, Distributed and Network-based Processing (PDP'06)*, IEEE Computer Society Press, pp. 64-71, Montbéliard-Sochaux (France), 2006 (with W. Wu, J. Cao, J. Yang -Hong-Kong-).

[C192] **The committee decision problem**. (66/224). *Proc. Latin American Theoretical Informatics Symposium (LATIN'06)*. Springer LNCS 3887, pp. 502-514, 2006 (with E. Gafni, S. Rajsbaum, C. Travers).

[C193] From failure detectors with limited scope accuracy to to system wide leadership. (153/521). *19th Int'l IEEE Conference on Advanced Information Networking and Applications (AINA'06)*, IEEE Computer Society Press, pp. 81-86, Vienna (Austria),2006 (with A. Mostefaoui, S. Rajsbaum, C. Travers).

[C194] A Leader Election Protocol for Eventually Synchronous Shared Memory Systems. *4th Int'l IEEE Workshop on Software Technologies for Future Embedded and Ubiquitous Systems (SEUS'06)*, IEEE Computer Press, pp. 75-80, Gyeongju (South Korea), 2006 (with R. Guerraoui).

[C195] **Leader election with weak assumptions on initial knowledge, communication reliability and synchrony**. (34/187) *36th Int'l IEEE Conference on Dependable Systems and Networks (DSN'06)*, IEEE Computer Society Press, pp. 166-175, Philadelphia (Pennsylvania), June 2006 (with A. Fernandez, E. Jimenez -Madrid-).

[C196] Strongly-terminating early-stopping k-set agreement in synchronous systems with general omission failures. *13th Colloquium on Structural Information and Communication Complexity (SIROCCO'06)*, Springer LNCS 4056, pp. 182-196, Chester (UK), 2006 (with P. Raipin Parvedy, C. Travers).

[C197] From static distributed systems to dynamic systems: an approach for a first step. U̲n̲d̲e̲r̲l̲i̲n̲e̲d̲ Invited Talk. *Proc. International workshop on Dynamic Distributed Systems (IWDDS'06)*, in conjunction with *25th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'06)*, IEEE Computer Society Press, Lisbon (Portugal), 2006.

[C198] **Irreducibility and additivity of set agreement-oriented failure detectors**. *25th ACM SIGACT-SIGOPS Int'l Symposium on Principles of Distributed Computing (PODC'06)*, ACM Press, pp. 153-162, Denver (Colorado), 2006 (with A. Mostefaoui, S. Rajsbaum, C. Travers).

[C199] The Power and Limit of adding synchronization messages for Synchronous Agreement. (64/201) *Proc. 35th Int'l Conference on Parallel Processing (ICPP'06)*, IEEE Computer Society Press, pp. 399-406, Colombus (Ohio), 2006 (with J. Cao, W. Wu, X. Wang -Hong-Kong-).

[C200] **Exploring Gafni's reduction land: from Ω^k to wait-free adaptive $(2p-\lceil \frac{p}{k} \rceil)$-renaming via k-set agreement**. (35/145) *Proc. 20th Int'l Symposium on DIStributed Computing (DISC'06)*, Springer LNCS 4167, pp. 1-16, Stockholm (Sweden), 2006 (with A. Mostefaoui, C. Travers).

[C201] Synchronous set agreement: a concise guided tour (including a new algorithm and a list of open problems). (41/117 *Proc. 12th Int'l IEEE Pacific Rim Dependable Computing Symposium (PRDC'2006)*, IEEE Society Press, pp. 267-274, Riverside (CA), 2006 (with C. Travers).

[C202] Core Persistence in Peer-to-peer Systems: Relating Size to Lifetime. *Proc. Workshop on Reliability in Decentralized Distributed Systems (RDDS'06)*, Springer LNCS 4278, pp. 1470-1479, Montpellier (France), 2006(with V. Gramoli, Anne-Marie Kermarrec, A. Mostefaoui, B. Sericola).

[C203] On the fly estimation of the processes that are alive/crashed in an asynchronous message-passing system. (41/117). *Proc. 12th Int'l IEEE Pacific Rim Dependable Computing Symposium (PRDC'2006)*, IEEE Society Computer Press, pp. 257-266, Riverside (CA), 2006 (with A. Mostefaoui, G. Tredan).

[C204] **Simultaneous consensus tasks: a tighter characterization of set consensus**. (31 regular/245). *Proc. 8th Int'l Conference on Distributed Computing and Networking (ICDCN'06)*, Springer LNCS 4308, pp. 331-341, Guwahati (India), 2006 (with Y. Afek, E. Gafni, S. Rajsbaum, C. Travers).

[C205] In search of the holy grail: looking for the weakest failure detector for wait-free set agreement. U̲n̲d̲e̲r̲l̲i̲n̲e̲d̲ Invited Talk. *Proc. 10th Int'l Conference On Principles Of Distributed Systems (OPODIS'06)*, Springer LNCS 4305, pp. 1-17, 2006 (with C. Travers).

[C206] A universal construction for wait-free objects. *Proc. ARES 2007 Workshop on Foundations of Fault-tolerant Distributed Computing (FOFDC 2007)*, IEEE Society Computer Press, pp. 959-966, 2007 (with R. Guerraoui).

[C207] A Timing Assumption and a t-Resilient Protocol for Implementing an Eventual Leader Service in Asynchronous Shared Memory Systems. *Proc. 10th Int'l IEEE Symposium on Objects and Component-oriented Real-time Computing (ISORC 2007)*, IEEE Society Computer Press, pp. 71-78, Santorini (Greece), 2007(with A. Fernandez, E. Jimenez, G. Tredan).

[C208] **The notion of a timed register and its application to indulgent synchronization**. (37/130) *19th ACM Symposium on Parallel Algorithms and Architectures (SPAA'07)*, San Diego (CA), ACM Press, pp. 200-209, 2007 (with G. Taubenfeld).

[C209] From renaming to k-set agreement. *14th Colloquium on Structural Information and Communication Complexity (SIROCCO'07)*, Springer LNCS 4474, pp. 62-76, Castiglioncello (Italy), 2007 (with A. Mostefaoui, C. Travers).

[C210] **Electing an eventual leader in an asynchronous shared memory system**. *37th Int'l IEEE Conference on Dependable Systems and Networks (DSN'07)*, IEEE Computer Society Press, pp. 399-408, Edinburgh (UK), 2007 (with A. Fernandez, E. Jimenez -Madrid-).

[C211] Distributed slicing in dynamic systems. (71/528) *27th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'07)*, IEEE Computer Society Press, pp. 209-218, Toronto (Canada), 2007(with A. Fernandez, V. Gramoli, E. Jimenez and Anne-Marie Kermarrec).

[C212] Eventual leader service in unreliable asynchronous systems: why? How? <u>Invited Talk</u>. *Proc. 6th IEEE International Symposium on Network Computing and Applications (NCA'07)*, IEEE Computer Society Press, pp. 11-21, Cambridge (MA), 2007.

[C213] From unreliable objects to reliable objects: the case of atomic registers and consensus. *9th Int'l Conference on Parallel Computing Technologies (PaCT'07)*, Peereslavl-Zalessky (Russia), Springer LNCS LNCS 4671, pp. 47-61, 2007 (with R. Guerraoui).

[C214] Towards a definition of dynamic distributed systems. *9th Int'l Conference on Parallel Computing Technologies (PaCT'07)*, Peereslavl-Zalessky (Russia), Springer LNCS 4671, pp. 1-14, 2007 (with R. Baldoni, M. Bertier, S. Tucci).

[C215] A subjective visit to selected topics in distributed computing. <u>Invited Talk</u>. *Proc. 21th Int'l Symposium on Distributed Computing (DISC'07)*, Springer LNCS 4731, pp. 5-6, 2007.

[C216] **Test&set, adaptive renaming and set agreement: a guided visit to asynchronous computability**.(25/185). *26th IEEE Symposium on Reliable Distributed Systems (SRDS'07)*, IEEE Computer Society Press, pp. 93-102, Beijing (China), 2007 (with E. Gafni, C. Travers).

[C217] The eventual clustered oracle and its application to consensus in MANETs. (25/185). *26th IEEE Symposium on Reliable Distributed Systems (SRDS'07)*, IEEE Computer Society Press, pp. 23-32, Beijing (China), 2007 (with Jiannong Cao, Weigang Wu -Hong-kong Polytechnic University-).

[C218] The Eventual Leadership in Dynamic Mobile Networking Environments. *Proc. 13th IEEE Pacific Rim International Symposium on Dependable Computing (PRDC'07)*, IEEE Computer Society Press, pp. 123-130, Melbourne (Australia), 17-19, 2007 (with Jiannong Cao, Weigang Wu -Hong-kong Polytechnic University-, C. Travers).

[C219] A Dual-Token-based Fault-Tolerant Mutual Exclusion Algorithm for MANETs. *Proc. 3rd Int'l Conference on Mobile Ad-hoc and Sensor Networks (MSN 2007)*, Springer LNCS LNCS 4864, pp. 572-583, Beijing (China), 2007 (with Jiannong Cao, Weigang Wu -Hong-kong Polytechnic University-).

[C220] Small-world networks: is there a mismatch between theory and practice? *Proc. 11th Int'l Conference On Principles Of Distributed Systems (OPODIS'07)*, Springer LNCS 4878, pp. 372-385, 2007 (with F. Bonnet, A.-M. Kermarrec).

[C221] **From an intermittent rotating star to a leader**. *Proc. 11th Int'l Conference On Principles Of Distributed Systems (OPODIS'07)*, Springer LNCS 4878, pp. 189-203, 2007 (with A. Fernandez).

[C222] Timed quorum systems for large scale and dynamic environments. *Proc. 11th Int'l Conference On Principles Of Distributed Systems (OPODIS'07)*, Springer LNCS 4878, pp. 429-442, 2007 (with V. Gramoli).

[C223] **Narrowing power vs efficiency in synchronous set agreement**. (30/185). *Proc. 9th Int'l Conference on Distributed Computing and Networking (ICDCN'08)*, Springer LNCS 4904, pp. 99-111, Kolkata (India), 2008 (with A. Mostefaoui, C. Travers).

[C224] Synchronization is coming back, but is it the same? <u>Invited Talk</u>. *IEEE 22nd Int'l Conference on Advanced Information Networking and Applications (AINA'08)*, pp. 1-10, Okinawa (Japan), 2008.

[C225] **Conditions for set agreement with an application to synchronous systems**. (102/638). *28th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'08)*, IEEE Computer Society Press, pp. 663-672, Beijing (China), 2008 (with F. Bonnet).

[C226] **The Iterated Restricted Immediate Snapshot (IRIS) Model**. (66/172). *14th Int'l Computing and Combinatorics Conference (COCOON'08)*, Dalian (China), Springer LNCS 5092, pp.487-496, 2008. (with S. Rajsbaum, C. Travers).

[C227] On modeling fault-tolerance of gossip-based reliable multicast protocols. *37th Int'l Conference on Parallel Processing (ICPP'08)*, IEEE Computer Society Press, pp. 149-156, Portland (OR), 2008 (with Xiaopeng Fan, Jiannong Cao, Weigang Wu -Hong-kong Polytechnic University-).

[C228] **No double discount: condition-based simultaneity yields limited gain**. *Proc. 22th Int'l Symposium on Distributed Computing (DISC'08)*, Springer LNCS 5218, pp. 423-437, 2008 (with Y. Moses -The Technion-).

[C229] Locks Considered Harmful: a Look at Non-traditional Synchronization. *Proc. 6th Int'l Workshop on Embedded and Ubiquitous computing Systems (SEUS'08)*, Springer, LNCS 5287, pp. 369-380, 2008.

[C230] On the solvability of anonymous partial grid exploration by mobile robots. (30 regular/102). *Proc. 12th Int'l Conference On Principles Of Distributed Systems (OPODIS'08)*, Springer LNCS 5401, pp. 428-445, 2008. (with R. Baldoni, F. Bonnet, A. Milani).

[C231] A Lock-based STM Protocol that Satisfies Opacity and Progressiveness. (30 regular/102). *Proc. 12th Int'l Conference On Principles Of Distributed Systems (OPODIS'08)*, Springer LNCS 5401, pp. 226-245, 2008 (with D. Imbs).

[C232] **Provable STM Properties: Leveraging Clock and Locks to Favor Commit and Early Abort**. (24 regular/176). *Proc. 10th Int'l Conference on Distributed Computing and Networking (ICDCN'09)*, Springer LNCS 5408, pp. 67-78, Hyderabad (India), 2009 (with D. Imbs).

[C233] Large scale networked systems: from anarchy to geometric self-structuring. (24 regular/176). *Proc. 10th Int'l Conference on Distributed Computing and Networking (ICDCN'09)*, Springer LNCS 5408, pp. 25-36, Hyderabad (India), 2009. (with A.-M. Kermarrec, A. Mostefaoui, A. Viana, G. Trédan).

[C234] Shared Memory Synchronization in Presence of Failures: an Exercise-based Introduction for the Sophomore. *IEEE Int'l Conference on Complex, Intelligent and Software Intensive Systems (CISIS'09)*, IEEE Computer Society Press, pp. 9-18, Fukuoka (Japan), 2009.

[C235] **Implementing a Register in a Dynamic Distributed System.** (74/455). *29th IEEE Int'l Conference on Distributed Computing Systems (ICDCS'09)*, IEEE Computer Society Press, pp. 639-647, Montreal (Canada), June 2009. (With R. Baldoni, S., Bonomi, A.-M. Kermarrec).

[C236] **A versatile STM protocol with invisible read operations that satisfies the virtual world consistency condition.** *Proc. 16th Colloquium on Structural Information and Communication Complexity (SIROCCO'09)*, Springer LNCS, 5869, pp. 266-280, May 2009. (With D. Imbs).

[C237] Regular Register: an Implementation in a Churn Prone Environment. *16th Colloquium on Structural Information and Communication Complexity (SIROCCO'09)*, Springer LNCS, 5869, pp. 15-29, May 2009. (With R. Baldoni, S., Bonomi).

[C238] Software Transactional Memories: an Approach for Multicore Programming. *10th Int'l Conference on Parallel Computing Technologies (PaCT'09)*, Novosibirsk (Russia), Springer LNCS 5698, pp. 26-40, 2009. (With D. Imbs).

[C239] Adding Dynamicity to the Uncertainty that Characterizes Distributed Systems: Challenges Ahead. *Proc. Franco-Brazilian Colloquium on Advances and Challenges in Computer Science (COLIBRI'09)*, pp. 141-147, Bento Gonçalves (Brazil), july 2009. (With R. Macedo, Salvador de Bahia, Brazil).

[C240] Software Transactional Memory: What? Why? How? A New Challenge? Invited Talk. *Proc. Franco-Brazilian Colloquium on Advances and Challenges in Computer Science (COLIBRI'09)*, pp. 5-7, Bento Gonçalves (Brazil), july 2009.

[C241] How to implement a shared memory in a dynamic system? Which are the constraints? Invited Talk. *Int'l Workshop on Theoretical Aspects of Dynamic Distributed Systems (TADDS'09)*, in conjunction with DISC 2009, Elche (Spain), 2009.

[C242] **Help when needed, but no more: Efficient Read/Write Partial Snapshot.** (33/117). *Proc. 23th Int'l Symposium on Distributed Computing (DISC'09)*, Springer LNCS 5805, pp. 142-156, 2009 (With D. Imbs).

[C243] **The Price of Anonymity: Optimal Consensus despite Asynchrony, Crash and Anonymity**.(33/117). *Proc. 23th Int'l Symposium on Distributed Computing (DISC'09)*, Springer LNCS 5805, pp. 341-355, 2009 (With F. Bonnet).

[C244] **Looking for the Weakest Failure Detector for k-Set Agreement in Message-passing Systems: Is Π_k the End of the Road?** Best paper award. (49/126). *Proc. 11th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'09)*, Springer LNCS 5873, pp. 149-164, 2009 (With F. Bonnet).

[C245] Visiting Gafni's Reduction Land: from the BG Simulation to the Extended BG Simuation. (49/126). *Proc. 11th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'09)*, Springer LNCS 5873, pp. 369-383, 2009 (With D. Imbs).

[C246] Joining a Distributed Shared Memory Computation in a Dynamic Distributed System. *Proc. 7th Workshop on Software Technologies for Future Embedded and Ubiquitous Computing Systems (SEUS'09)*, Springer LNCS 5860, pp. 91-102, 2009 (With R. Baldoni, S. Bonomi).

[C247] D2HT: the best of both worlds, Integrating RPS (Random Peer Sampling) and DHT. *8th European Dependable Computing Conference (EDCC'10)*. IEEE Computer Society Press, Valencia (Spain), April 2010 (With M. Bertier, F. Bonnet, A.-M. Kermarrec, V. Leroy, S. Peri).

[C248] Early Consensus in Message-passing Systems Enriched with a Perfect Failure Detector and its Application in the Theta Model. *8th European Dependable Computing Conference (EDCC'10)*. IEEE Computer Society Press, Valencia (Spain), April 2010 (With F. Bonnet).

[C249] Consensus in Anonymous Distributed Systems: Is There a Weakest Failure Detector? *24th IEEE International Conference on Advanced Information Networking and Applications (AINA'10)*, IEEE Computer Society Press, Perth (Australia), April 2010 (With F. Bonnet).

[C250] **The Multiplicative Power of Consensus Numbers**. (39/179). *29th ACM Symposium on Principles of Distributed Computing (PODC'10)*, ACM Press, pp. 26-35,July 2010, Zurich. (With D. Imbs.)

[C251] On Asymmetric Progress Conditions.(39/179). *29th ACM Symposium on Principles of Distributed Computing (PODC'10)*, ACM Press, pp. 55-64, July 2010, Zurich. (With D. Imbs, G. Taubenfeld.)

[C252] Value-based Sequential Consistency for Set Objects in Dynamic Distributed Systems. *Proc. 16th Int'l European Parallel Computing Conference (EUROPAR'10)*, Springer LNCS 6271, pp. 523-534, 2010. (With R. Baldoni, S., Bonomi).

[C253] The x-Wait-freedom Progress Condition. *Proc. 16th Int'l European Parallel Computing Conference (EUROPAR'10)*, Distinguished paper award. Springer LNCS 6271, pp. 584-595, 2010. (With D. Imbs.)

[C254] **Anonymous Asynchronous Systems: the Case of Failure Detectors**. Best paper award. *Proc. 24th Int'l Symposium on Distributed Computing (DISC'10)*, Springer LNCS 6343, pp. 206-220, 2010. (With F. Bonnet.)

[C255] On Adaptive Renaming under Eventually Limited Contention. *Proc. 12th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'10)*, Springer LNCS 6366, pp. 377-387, 2010. (With D. Imbs.)

[C256] Signature-Free Broadcast-Based Intrusion Tolerance: Never Decide a Byzantine Value. *Proc. 14th Int'l Conference On Principles Of Distributed Systems (OPODIS'010)*, Springer LNCS 6490, pp. 144-159, 2010. (With A. Mostéfaoui.)

[C257] **A Necessary and Sufficient Condition for Solving Byzantine Consensus in Symmetric Networks**. (31 regular/140). *Proc. 12th Int'l Conference on Distributed Computing and Networking (ICDCN'11)*, Springer LNCS 6522, pp. 215-226, Bangalore (India), 2011. (With O. Baldellon, A. Mostéfaoui.)

[C258] A Theory-Oriented Introduction to Wait-free Synchronization Based on the Adaptive Renaming Problem. *IEEE 25nd Int'l Conference on Advanced Information Networking and Applications (AINA'11)*, IEEE Computer Press, pp. 356-363, Singapore, March 2011. (With S. Rajsbaum.)

[C259] A Simple Snapshot Algorithm for Multicore Systems. *Proc. 5th IEEE Latin-American Symposium on Dependable Computing (LADC'11)*, IEEE Computer Press, pp. 17-23, Sao José dos Campos (Brazil) March 2011. (With D. Imbs.)

[C260] k-Bounded Set Objects in Eventually Synchronous Distributed Systems with Churn and Continuous Accesses. *Proc. 13th European Workshop on Dependable Computing (EDCC'11)*; ACM Digital Library, ISBN 978-1-4503-0284-5, 2011. (With R. Baldoni, S. Bonomi).

[C261] Looking for Efficient Implementations of Concurrent Objects. *11th Int'l Conference on Parallel Computing Technologies (PaCT'11)*, Kazan, (Russia), Springer LNCS 6873, pp. 74-87, 2011. (With A. Mostefaoui).

[C262] Power and limits of distributed computing shared memory models. Invited talk. *Proc. 2nd Int'l Workshop on Logical Aspects of Fault-Tolerance (LAFT'11)*, in conjunction with the Int'l conference *Logic In Computer Science (LICS'11)*, Toronto, Canada, June 2011. (With S. Rajsbaum.)

[C263] Specifying and Implementing an Eventual Leader Service for Dynamic Systems. (56/168). *Proc. 14th Int'l Conference on Network-Based Information Systems (NBiS'11)*, pp. 243-249, IEEE Press, September 2011. (With M. Larrea.)

[C264] Distributed Computing with Mobile Robots: an Introductory Survey. (56/168). *Proc. 14th Int'l Conference on Network-Based Information Systems (NBiS'11)*, pp. 318-324, IEEE Press, September 2011. (With M. Gradinariu, S. Tixeuil.)

[C265] **The Universe of Symmetry Breaking Tasks**. *Proc. 18th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'11)*, Springer LNCS 6796, pp. 66-77, 2011. (With D. Imbs, S. Rajsbaum.)

[C266] A Survey on Some Recent Advances in Shared Memory Models.(56/168). *Proc. 18th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'11)*, Springer LNCS 6796, pp. 17-28, 2011. (With S. Rajsbaum.)

[C267] Ressources informatiques : encore une histoire de temps ! *Colloque du 20ème Anniversaire de l'Institut Universitaire de France*, Les colloques de l'IUF, Presses de l'université de St-Etienne, pp. 225-243, Lyon, Mai 2011. (With Benoit A., Paschos V., Robert Y., and Trystram D.)

[C268] On the Implementation of Concurrent Objects. *Dependable and Historic Computing (Randell's Tales: a Festschrift recognising the contributions of Brian Randell)*, Springer LNCS 6875, pp. 453-478, 2011.

[C269] **The weakest failure detector to implement a register in asynchronous systems with hybrid communication**. (29/79). Best paper award. *Proc. 13th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'11)*, Springer LNCS 6976, pp. 268-282, 2011. (With D. Imbs.)

[C270] Relations linking failure detectors associated with k-set agreement in message-passing systems. (29/79). *Proc. 13th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'11)*, Springer LNCS 6976, pp. 341-355, 2011. (With A. Mostefaoui, J. Stainer.)

[C271] Read invisibility, virtual world consistency and permissiveness are compatible. (24/88). *Proc. 11th Int'l Conference on Algorithms and Architectures for Parallel Processing (ICA3PP)*, Springer LNCS 7016, pp. 245-258, 2011. (With T. Crain, D. Imbs.)

[C272] Towards a Universal Construction for Transaction-based Multiprocess Programs. *Proc. 13th Int'l Conference on Distributed Computing and Networking (ICDCN'12)*, Springer LNCS 7129, pp. 61-75, Hong-Kong, 2012. (With T. Crain, D. Imbs.)

[C273] A Transaction-Friendly Binary Search Tree. (26/175). *Proc. 17th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP'12)*, ACM Press, pp. 161-170, 2012. (With T. Crain, V. Gramoli.)

[C274] A look at distributed recursion. Invited talk. *LADA (Languages for Distributed Algorithms), Satellite Workshop of the 33rd ACM POPL (Principles of Programming Languages) conference*, ACM Press, January 2012.

[C275] **Renaming is Weaker than Set Agreement but for Perfect Renaming: A Map of Sub-Consensus Tasks**. *Proc. 10th Latin American Theoretical INformatics Symposium (LATIN'12)*, Springer LNCS 7256, pp. 145-156, 2012. (With A. Castaneda, D. Imbs, S. Rajsbaum.)

[C276] Trying to Unify the LL/SC Synchronization Primitive and the Notion of a Timed Register. (126/445). *IEEE 26th Int'l Conference on Advanced Information Networking and Applications (AINA'12)*, IEEE Computer Press, pp. 326-330, Fukuoka, March 2012. (With D. Imbs.)

[C277] **Failure Detectors in Homonymous Distributed Systems (with an Application to Consensus)**. (71/515). *Proc. 32nd Int'l Conference on Distributed Computing Systems (ICDCS'12)*, IEEE Computer Press, pp. 275-284, 2012. (With S. Arevalo, A. Fernandez, D. Imbs, E. Jimenez.)

[C278] A simple asynchronous shared memory consensus algorithm based on Ω and closing sets. (54/215). *Proc. 6th Int'l Conference on Complex, Intelligent, and Software Intensive Systems (CISIS'12)*, IEEE Computer Press, pp. 357-364, 2012. (With J. Stainer.)

[C279] Leader Election: From Higham-Przytycka's Algorithm to a Gracefully Degrading Algorithm. (54/215). *Proc. 6th Int'l Conference on Complex, Intelligent, and Software Intensive Systems (CISIS'12)*, IEEE Computer Press, pp. 225-232, 2012. (With José-Ramon Mendivil and Itziar Arrieta.)

[C280] **Increasing the Power of the Iterated Immediate Snapshot Model with Failures Detectors**. *Proc. 19th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'12)*, Springer LNCS 7355, pp. 231-242, 2012. (With J. Stainer.)

[C281] **From a store-collect object and Ω to efficient asynchronous consensus**. *Proc. 18th Int'l European Parallel Computing Conference (EUROPAR'12)*, Springer LNCS 7484, pp. 427-438, 2012.(With J. Stainer.)

[C282] **Chasing the Weakest Failure Detector for k-Set Agreement in Message-passing Systems**. *Proc. 11th IEEE Int'l Symposium on Network Computing and Applications (NCA'12)*, IEEE Press, pp. 44-51, Boston (USA), 2012. (With A. Mostéfaoui, J. Stainer.)

[C283] STM systems: Enforcing strong isolation between transactions and non-transactional code. *Proc. Int'l Conference on Algorithms and Architectures for Parallel Processing (ICA3PP'12)*, Springer LNCS 7439, pp. 317-331, 2012. (With T. Crain, E. Kanellou.)

[C284] When and How Process Groups can be Used to Reduce the Renaming Space. *Proc. 16th Int'l Conference On Principles Of Distributed Systems (OPODIS'12)*, Springer LNCS 7702, pp. 91–105 , 2012. (With A. Castaneda, J. Stainer.)

[C285] Coordination and Computation in Distributed Intelligent MEMS.(159/567). *IEEE 27nd Int'l Conference on Advanced Information Networking and Applications (AINA'13)*. IEEE Computer Press, pp.129–136, Barcelona, March 2013. (With J. Bourgeois J., Cao J., Raynal M., Dhoutaut D., Piranda, E. Dedu E., Mostefaoui M., and Mabed H.)

[C286] A short introduction to synchronous communication. (159/567). *IEEE 27nd Int'l Conference on Advanced Information Networking and Applications (AINA'13)*, IEEE Computer Press, pp. 1136-1143, Barcelona, March 2013.

[C287] **Agreement via Symmetry Breaking: On the Structure of Weak Subconsensus Tasks**. (106/494). *Proc. 27th IEEE Int'l Parallel & Distributed Processing Symposium (IPDPS'13)*, IEEE Press, pp. 1147-1158, 2013. (With A. Castaneda, S. Rajsbaum.)

[C288] **No hot spot non-blocking skip list**. (61/464). *Proc. 33nd Int'l Conference on Distributed Computing Systems (ICDCS'13)*, IEEE Computer Press, pp. 196-205, 2013. (With T. Crain, V. Gramoli.)

[C289] On the Consensus Number of Non-Adaptive Perfect Renaming. *Proc. First Int'l Conference on Networked Systems (NETYS'13)*, Springer LNCS 7853, pp. 1-12, 2013. (With A. Castaneda.)

[C290] **Round-based Synchrony Weakened by Message Adversaries *vs* Asynchrony Enriched with Failure Detectors.** *32th ACM Symposium on Principles of Distributed Computing (PODC'13)*, ACM Press, pp. 166-175, 2013. (With J. Stainer.)

[C291] A Contention-friendly binary search tree. (70/261). *Proc. 19th Int'l European Parallel Computing Conference (EUROPAR'13)*, Springer LNCS 8097, pp. 229-240, 2013. (With T. Crain, V. Gramoli.)

[C292] Cliff-edge consensus: agreeing on the precipice. *12th Int'l Conference on Parallel Computing Technologies (PaCT'13)*, St-Petersbourg (Russia), Springer LNCS 7979, pp. 51-64, 2013. (With Taïnai F., Porter B., Coulson G.)

[C293] Simultaneous consensus vs set agreement a message-passing sensitive hierarchy of agreement problems. *Proc. 20th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'13)*, Springer LNCS 8179, pp. 298-309, 2013. (With J. Stainer.)

[C294] A generalized mutual exclusion problem and its algorithm. *42nd Int'l Conference on Parallel Processing (ICPP'13)*, IEEE Press pp. 300-309, Lyon (France), 2013. (With A. Luo and W. Wu –Sun Yat-Sen University, Guangzhou, China–, and J. Cao –Poly U, Hong-Kong–.)

[C295] Fault-tolerant leader election in mobile dynamic distributed systems. *19th IEEE Int'l Pacific Rim Symposium on Dependable Computing*. IEEE Press, pp. 78-87, 2013. (With Gómez-Calzado, Lafuente A., Larrea M., Spain.)

[C296] Concurrency-related distributed recursion. Invited talk. *Proc. 15th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'13)*, Springer LNCS 8255, pp. xviii-xx, 2013.

[C297] **Computing in the Presence of Concurrent Solo Executions**. *Proc. 11th Latin American Symposium on Theoretical INformatics (LATIN'14)*, Springer LNCS 8392, pp. 214-225, 2014. (With M. Herlihy, S. Rajsbaum, J. Stainer).

[C298] What can be computed in a distributed system? Invited talk. *Workshop "From Programs to Systems: The Systems Perspective in Computing" workshop in honor of Professor Joseph Sifakis*, Springer LNCS 8415, pp. 209-224, 2014.

[C299] A simple broadcast algorithm for recurrent dynamic systems. *IEEE 28nd Int'l Conference on Advanced Information Networking and Applications (AINA'14)*. IEEE Computer Press, pp. 933-939, Vancouver, May 2014. (With Cao J. –Hong Kong Polytechnic University–, J. Stainer –IRISA–, W. Wu –Sun Yat-Sen Univerity, Guangzhou, China–.)

[C300] Simple deadlock detection for the And-communication model. (50/167.) *8th IEEE Int'l Conference on Complex, Intelligent and Software Intensive Systems (CISIS'14)*, IEEE Computer Society Press, pp. 273-278, Birmingham (UK), 2014.

[C301] **Signature-free asynchronous Byzantine consensus with $t < n/3$ and $O(n^2)$ messages.** Best paper award. *Proc. 33th ACM Symposium on Principles of Distributed Computing (PODC'14)*, ACM Press, pp. 2-9, 2014. (With A. Mostéfaoui and Hamouma Moumen.)

[C302] From Turing to the clouds (on the computability power of distributed systems). Invited talk. *Proc. 21th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'14)*, Springer LNCS 8576, pp. xiii-xiv, 2014.

[C303] **Reliable shared memory abstractions on top of asynchronous Byzantine message-passing systems**. *Proc. 21th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'14)*, Springer LNCS 8576, pp. 37-53, 2014. (With D. Imbs, S. Rajsbaum, J. Stainer.)

[C304] An Exercise in concurrency: from non-blocking objects to fair objects. (52/181). *17th IEEE Int'l Conference on Network-based Information Systems (NBIS'14)*, IEEE Computer Society Press, pp. 1-7, 2014. (With C. Delporte and H. Fauconnier.)

[C305] Fair synchronization in the presence of process crashes, and its weakest failure detector. *Proc. 33rd Int'l Symposium on Reliable Distributed Systems (SRDS'14)*, IEEE Press, pp. 161-170, 2014. (With C. Delporte, H. Fauconnier.)

[C306] **Distributed universality**. (32/98). *Proc. 18th Int'l Conference On Principles Of Distributed Systems (OPODIS'14)*, Springer LNCS 8878, pp. 469484, 2014. (With J. Stainer and G. Taubenfeld.)

[C307] A simple predicate to expedite the termination of a randomized consensus algorithm (140/472). *IEEE 29nd Int'l Conference on Advanced Information Networking and Applications (AINA'15)*. IEEE Computer Press, pp. 106-111, March 2015.

[C308] Fisheye consistency: keeping data in synchr in a georeplicated world. *Proc. Third Int'l Conference on Networked Systems (NETYS'15)*, Springer LNCS 9466, pp. 246-262, 2015. (With R. Friedman and F. Taïani.)

[C309] **Minimal synchrony for asynchronous Byzantine consensus**. *Proc. 34th ACM Symposium on Principles of Distributed Computing (PODC'15)*, ACM Press, pp. 461-470, 2015. (With Z. Bouzid and A. Mostéfaoui.)

[C310] **Stabilizing server-based storage in Byzantine asynchronous message-passing systems**. *Proc. 34th ACM Symposium on Principles of Distributed Computing (PODC'15)*, ACM Press, pp. 471-480, 2015. (With S. Bonomi (Roma), M. Potop-Butucaru (LIP6), and S. Dolev (Ben Gourion University, Israël).)

[C311] Communication patterns and input patterns in distributed computing. <u>Invited talk</u>. *Proc. 22th Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'15)*, Springer LNCS 9439, pp. 1-15, 2015.

[C312] Concurrent systems: hybrid object implementations and abortable objects. <u>Invited talk</u>. *Proc. 21th Int'l European Parallel Computing Conference (EUROPAR'15)*, Springer LNCS 9233, pp. 3-15, 2015.

[C313] **Signature-free asynchronous Byzantine systems: from multivalued to binary consensus with $t < n/3$, $O(n^2)$ messages, and constant time.** *Proc. 22nd Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'15)*, Springer LNCS 9439, pp. 194-208, 2015. (With A. Mostéfaoui.)

[C314] Parallel computing *vs* distributed computing: a great confusion? *Proc. 1st European Workshop on Parallel and Distributed Computing Education for Undergraduate Students (Euro-EDUPAR), Satellite workshop of EUROPAR'15*, Springer LNCS 9523, pp. 41-53, 2015.

[C315] **Specifying concurrent problems: beyond linearizability and up to tasks**. *Proc. 29th Symposium on Distributed Computing (DISC'15)*, Springer LNCS 9363, pp. 420-435, 2015. (With A. Castañeda and S. Rajsbaum, UNAM, Mexico).

[C316] Eventual leader election despite crash-recovery and omission failures. *21th IEEE Int'l Pacific Rim Symposium on Dependable Computing (PRDC'15)*. IEEE Press, pp. 209-214, 2015. (With Fernńdez-Campusano F., Larrea M., Cortiñas R.).

[C317] **Anonymous obstruction-free (n, k)-set agreement with $(n - k + 1)$ atomic read/write registers**. *Proc. 19th Int'l Conference On Principles Of Distributed Systems (OPODIS'15)*, Leibniz Int'l Proceedings in Informatics, LIPICS 46, Article 18:1-17 (ISBN 978-3-939897-98-9) 2015. (With Z. Bouzid and P. Sutra.)

[C318] Signature-free communication and agreement in the presence of Byzantine processes. *Proc. 19th Int'l Conference On Principles Of Distributed Systems (OPODIS'15)*, Leibniz Int'l Proceedings in Informatics, LIPICS 46, Article 1:1-11 (ISBN 978-3-939897-98-9) 2015.

[C319] A Communication-efficient leader election algorithm in partially synchronous systems prone to crash-recovery and omission failures. *Proc. 17th Int'l Conference on Distributed Computing and Networking (ICDCN'16)*, ACM Press, Article 5, 6 pages, 2016. (With M. Larea, Ch. Fernãndez, and R. Cortiñas, University of the Basque Country, Spain).

[C320] Modular randomized Byzantine k-set agreement in asynchronous message-passing systems. *Proc. 17th Int'l Conference on Distributed Computing and Networking (ICDCN'16)*, ACM Press, Article 8, 10 pages, 2016. (With Achour Mostéfaoui and Hamouma Moumen.)

[C321] Efficient broadcast protocol for Internet of things. (160/541.) (With H. Lakhlef and J. Bourgeois). *30th IEEE Int'l Conference on Advanced Information Networking and Applications (AINA'16)*. IEEE Computer Press, pp. 999-1005, March 2016.

[C322] A look at basics of distributed computing. <u>Invited tutorial</u>. *Proc. 36th IEEE Int'l Conference on Distributed Computing (ICDCS'16)*, IEEE Press, pp. 1-11, 2016.

[C323] Time-efficient atomic read/write register in crash-prone asynchronous message-passing systems. (21/124). *Proc. 4th Int'l Conference on Networked Systems (NETYS'16)*, Springer LNCS 9944, pp. 250-265, 2016. (With Achour Mostéfaoui.)

[C324] **Two-bit messages are sufficient to implement atomic read/write registers in crash-prone systems**. (40/137) *Proc. 35th ACM Symposium on Principles of Distributed Computing (PODC'16)*, ACM Press, pp. 381-390, 2016. (With Achour Mostéfaoui.)

[C325] Optimal collision/conflict-free distance-2 coloring in wireless broadcast/receive synchronous tree networks. (54/251). *Proc. 45th Annual Conference on Parallel Processing (ICPP'16)*, pp. 350-359, 2016. (With Davide Frey and Hicham Lakhlef.)

[C326] t-**Resilient immediate snapshot is impossible**. *Proc. 23nd Int'l Colloquium on Structural Information and Communication Complexity (SIROCCO'16)*, Springer LNCS 9988, pp. 177-191, 2016. (With C. Delporte and H. Fauconnier, Université Paris 7–, and S. Rajsbaum, UNAM, Mexico.)

[C327] **Are Byzantine failures really different from crash failures?** (32/132). *Proc. 30th Symposium on Distributed Computing (DISC'16)*, Springer LNCS 9888, pp. 215-229, 2016. (With Damien Imbs and Julien Stainer.)

[C328] Vertex coloring with communication and local memory constraints in synchronous broadcast networks. *Proc. 12th Int'l Symposium on Algorithms and Experiments for Wireless Sensor Networks (ALGOSEN-SORS'16)*, Springer LNCS 10050, pp. 29-44, 2016. (With Hicham Lakhlef and François Taïani.)

[C329] Implementing snapshot objects on top of crash-prone asynchronous message-passing systems. *Proc. 16th Int'l Conference on Algorithms and Architectures for Parallel Processing (ICA3PP'16)*, Springer LNCS 10048, pp. 341-355, 2016. (With C. Delporte and H. Fauconnier –Paris 7–, and S. Rajsbaum, UNAM, Mexico.)

[C330] **Making local algorithms wait-free, the case of ring coloring**. *Proc. 18th Int'l Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS'16)*, Springer LNCS 10083, pp. 109-125, 2016. (With A. Castañeda and S. Rajsbaum, UNAM, Mexico, and C. Delporte and H. Fauconnier, IRIF, Paris 7.)

[C331] Providing collision-free and conflict-free communication in general synchronous broadcast/receive networks. (With A. Bouhabdallah, Hicham Lakhlef and François Taïani.) *Proc.31th IEEE Int'l Conference on Advanced Information Networking and Applications (AINA'17)*. IEEE Computer Press, pp. 309-406, March 2017.

[C332] Early decision in synchronous consensus: a predicate-based guided tour. *Proc. 5th Int'l Conference on Networked Systems (NETYS'17)*, Springer LNCS 10299, pp. aaa-bbb, 2017. (With A. Castañeda, Y. Moses, and M. Roy.)

[C333] **Long-lived tasks**. *Proc. 5th Int'l Conference on Networked Systems (NETYS'17)*, Springer LNCS 10299, pp. aaa-bbb, 2017. (With A. Castañeda and S. Rajsbaum.)

———————————————— Current submissions to conferences ————————————————

[C334] Signature/randomization/Leader-free Byzantine consensus for consortium blockchains. (With T. Crain and V. Gramoli –Sydney University–, M. Larrea (Basque Conutry University).

[C335] Another look at the implementation of atomic read/write registers in asynchronous message-passing systems. (With D. Imbs, A. Mostéfaoui, and M. Perrin).

[C336] Which broadcast abstraction captures k-set agreement? (With D. Imbs, A. Mostéfaoui, and M. Perrin).

G Other publications

1. Architecture, matériel et réseaux. In *L'état des sciences et des techniques, Collection L'Etat du Monde, Ed. La Découverte*, Paris, 1991.

2. Protocoles et fiabilité. In : *le Courrier du CNRS*, n°80, 1993.

3. A simple taxonomy for distributed mutual exclusion algorithms. *ACM Operating Systems Review*, vol.25(1): 47-51, 1991.

4. About logical clocks for distributed systems. *ACM Operating Systems Review*, vol.26(1):41-48, 1992.

5. Elements for a course on the design of distributed algorithms. *ACM SigCSE Bulletin*, vol.24,2, (1992), pp. 35-40 (with N. Plouzeau).

6. Local states in distributed computations : a few relations and formulas. *ACM Operating Systems Review*, 28(2):65-72, 1994 (with E. Fromentin).

7. An introduction to distributed algorithms. *IEEE Parallel and Distributed Technology*, vol.3(4), 1995.

8. From serializable to causal transactions. *Brief Announcement Proc. 15th ACM Symposium on Principles of Distributed Computing (PODC'96)*, 1996, Philadelphia, PA, ACM Press, p. 310 (with G. Thiakime and M. Ahamad -georgia tech-).

9. About state recording in asynchronous computations. *Brief Announcement. Proc. 15th ACM Symposium on Principles of Distributed Computing (PODC'96)*, 1996, Philadelphia, PA, ACM Press, p. 55 (with R. Baldoni and J.-M. Helary).

10. Efficient delta-causal broadcasting for multimedia applications. *Brief Announcement. Proc. 15th ACM Symposium on Principles of Distributed Computing (PODC'96)*, 1996, Philadelphia,PA, ACM Press, p. 89.

11. Consensus-based management of distributed and replicated data. *IEEE Bulletin on Data Engineering*, (*Special Issue on data Replication*), 21(4):30-37, 1998.

12. Time and Message efficient S-Based Consensus Algorithms. *Brief Announcement. 19th ACM Int'l Symposium on Principles of Distributed Computing (PODC'00)*, ACM Press, p. 332, 2000.

13. Early stopping in global data computation. *Brief Announcement. Proc. 21th ACM Symposium on Principles of Distributed Computing (PODC'02)*, ACM Press, p. 258, 2002 (with C. Delporte, H. Fauconnier, J.M. Helary).

14. Efficient maintenance of views at data wharehouses. *Brief Announcement. Proc. 21th ACM Symposium on Principles of Distributed Computing (PODC'02)*, ACM Press, p. 129, 2002 (with CA. Mostefaoui, M. Roy, D. Agrawal, A. el Abbadi -Santa Barbara university).

15. Building responsive TMR-based servers in presence of timing constraints. *Brief Announcement. Proc. 21th ACM Symposium on Principles of Distributed Computing (PODC'02)*, ACM Press, p. 127, 2002, (with P. Ezhilchelvan) -University of Newcastle-, J.-M. Helary).

16. Asynchronous Interactive Consistency and its Relation with Error Correcting Codes. *Brief Announcement. Proc. 21th ACM Symposium on Principles of Distributed Computing (PODC'02)*, p. 253, 2002 (with A. Mostefaoui, S. Rajsbaum).

17. Sequential Consistency as Lazy Linearizability. Short paper, *14th ACM Symposium on Parallel Algorithms and Architectures (SPAA'02)*, ACM Press, pp. 151-152, 2002.

18. Early Decision Despite General Process Omission Failures. *Brief Announcement. Proc. 22th ACM Symposium on Principles of Distributed Computing (PODC'03)*, ACM Press, p. 222, 2003 (with F. le Fessant, Ph. Raipin Parvedy).

19. The condition-based synchronous consensus hierarchy. *Brief Announcement. Proc. 23th ACM Symp. on Principles of Distributed Computing (PODC'04)*, ACM Press, p. 399, 2004 (with A. Mostefaoui, S. Rajsbaum).

20. Veto number and the respective power of $\Diamond\mathcal{S}$ and $\Diamond\mathcal{P}$. *Brief Announcement. Proc. 23th ACM Symp. on Principles of Distributed Computing (PODC'04)*, p. 398, 2004 (with R. Friedman, A. Mostefaoui).

21. Abstractions for Implementing Atomic Objects in Distributed Systems. *Brief Announcement. Proc. 24th ACM Symp. on Principles of Distributed Computing (PODC'05)*, ACM Press, p. 354, 2005, (with R. Friedman, A. Mostefaoui).

22. Failure detectors are schedulers. *Brief Announcement. Proc. 26th ACM Symp. on Principles of Distributed Computing (PODC'07)*, ACM Press, p. 308-309, 2007 (with S. Rajsbaum, C. Travers).

23. From an intermittent rotating star to a leader. *Brief Announcement. Proc. 26th ACM Symp. on Principles of Distributed Computing (PODC'07)*, ACM Press, p. 320-321, 2007 (with A. Fernandez).

24. DISC at its 20th anniversary. *Proc. 21th Int'l Symposium on Distributed Computing (DISC'07)*, Springer LNCS 4731, pp. 501-504, 2007 (with S. Zaks, S. Toueg).

25. From Anarchy to Geometric Structuring: the Power of Virtual Coordinates. *Brief Announcement. Proc. 27th ACM Symp. on Principles of Distributed Computing (PODC'08)*, ACM Press, p. 435, 2008 (with A.-M. Kermarrec, A. Mostéfaoui,G. Trédan, A. C. Viana).

26. Looking for the Optimal Conditions for Solving Set Agreement. *Brief Announcement. Proc. 27th ACM Symp. on Principles of Distributed Computing (PODC'08)*, ACM Press, p. 446, 2008 (with F. Bonnet).

27. On the Solvability of Anonymous Partial Grids Exploration by Mobile Robots. *Brief Announcement. Proc. 27th ACM Symposium on Distributed Computing (DISC'08)*, Springer 5218, pp. 496-497, 2008 (with R. Baldoni, F. Bonnet, A. Milani).

28. The Price of Anonymity: Optimal Consensus despite Asynchrony, Crash and Anonymity. *Brief Announcement. Proc. 28th ACM Symp. on Principles of Distributed Computing (PODC'09)*, ACM Press, pp. 280-281, 2009. (With F. Bonnet.)

29. Virtual World Consistency: a new Condition for STM Systems. *Brief Announcement. Proc. 28th ACM Symp. on Principles of Distributed Computing (PODC'09)*, ACM Press, pp. 294-295, 2009. (With D. Imbs and J. Mendivil - Pamplona, Spain-.)

30. The Price of Anonymity: Optimal Consensus despite Asynchrony, Crash and Anonymity. *Brief Announcement. Proc. 27th ACM Symposium on Principles of Distributed Computing (PODC'09)*, ACM Press, pp. 294-295, 2009. (With F. Bonnet.)

31. Read invisibility, virtual world consistency and permissiveness are compatible. *Brief Announcement. Proc. 23rd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'11)*, ACM Press, pp. 315-316, 2011, (With T. Crain, D. Imbs.

32. The Universe of Symmetry Breaking Tasks. *Brief Announcement. Proc. 29th ACM Symposium on Principles of Distributed Computing (PODC'11)*, ACM Press, pp. 287-288, 2011, (with D. Imbs, S. Rajsbaum).

33. $\Delta\Omega$: Specifying an Eventual Leader Service for Dynamic Systems. *Brief Announcement. Proc. 27th Symposium on Distributed Computing (DISC'11)*, Springer LNCS 6950, pp. 328-329, 2011, Roma (Italy). (With M. Larrea.)

34. Increasing the Power of the Iterated Immediate Snapshot Model with Failure Detectors. *Brief Announcement. Proc. 30th ACM Symposium on Principles of Distributed Computing (PODC'12)*, ACM Press, pp. 337-338, 2012. (With Julien Stainer.)

35. There are Plenty of Tasks Weaker than Perfect Renaming and Stronger than Set Agreement. *Brief Announcement. Proc. 30th ACM Symposium on Principles of Distributed Computing (PODC'12)*, ACM Press, pp. 97-98, 2012. (With Armando Castañeda and Sergio Rajsbaum.)

36. Computing in the Presence of Concurrent Solo Executions. *Brief Announcement. Proc. 29th Symposium on Distributed Computing (DISC'13)*, Springer 8205, pp. 563-564, 2013. (With S. Rajsbaum & J. Stainer.)

37. Revisiting Dynamic Distributed Systems. *Brief Announcement. Proc. 29th Symposium on Distributed Computing (DISC'13)*, Springer LNCS 8205, pp. 561-562, 2013. (With Gómez-Calzado C., Lafuente A., and Larrea M.)

38. Distributed Universality: Contention-Awareness, Wait-freedom, and Object Progress. Brief Announcement. *Proc. 33th ACM Symposium on Principles of Distributed Computing (PODC14)*, ACM Press, pp. 206-208, 2014. (With Julien Stainer and Gadi Taubenfeld).

39. Anonymous obstruction-free (n, k)-set agreement with $(n - k + 1)$ atomic read/write registers. *Brief Announcement. Proc. 31th Symposium on Distributed Computing (DISC'15)*, Springer LNCS 9363, pp. 669-670, 2015. (With Z. Bouzid and P. Sutra.)

Curriculum Vitae
Joost-Pieter Katoen
September 23, 2016

Personal details	
Name :	Prof. dr. ir. Joost-Pieter Katoen (PDEng)
Date and place of birth:	October 6, 1964; Krimpen aan den IJssel
Nationality :	Dutch
Sex :	male
Status :	married (3 children)
Postal address:	Onderstebosch 1, 6228 SC Maastricht, The Netherlands
Tel:	+49-241-8021200 (work)
E-mail:	katoen@cs.rwth-aachen.de
URL:	moves.informatik.rwth-aachen.de/

Research

- Reactive, stochastic, and real-time systems

- Formal semantics

- Computer-aided verification, in particular model checking

- Concurrency theory

Education

April 1996	Ph.D, Computer Science	University of Twente
February 1990	Professional Doctorate in Engineering	Eindhoven University of Technology
December 1987	M.Sc., Computer Science (with distinction)	University of Twente

Employment

Since January 2009	Part-time Professor (0.2 fte) Computer Science	University of Twente The Netherlands
Since December 2004	Full (C4) Professor Computer Science	RWTH Aachen University Germany
March 1999 to December 2008	Associate Professor Computer Science (0.2 fte since December 2004)	University of Twente The Netherlands

January 1997 to February 1999	Postdoctoral Scientist Computer Architecture and Performance Evaluation Group	University of Erlangen -Nürnberg Germany
April 1992 to December 1996	Research Associate Tele-Informatics and Open Systems Group	University of Twente The Netherlands
January 1990 to March 1992	Research Scientist Information and Software Technology	Philips Research Labs The Netherlands

Honors

- Best paper awards at FACS 2014, IDEA 2016, and ETAPS 2016. Paper in Top-100 of most cited papers in Software Engineering[1].

- Member of the Academia Europaea, 2013.

- Distinguished Professor at RWTH Aachen University, 2013.

- Visiting Fellow Trinity College, University of Oxford (UK), June-Sep 2013.

- Theodore von Kármán Fellow, RWTH Aachen University, 2013.

- Visiting Professor University de Grande Region (UniGR)[2], March-May 2013.

- Member IFIP WG 2.2 on Formal Description of Programming Concepts, 2010.

- Teaching Award Computer Science Department, RWTH Aachen University, 2010.

- ACM Senior Member, 2009.

- Member IFIP WG 1.8 on Concurrency Theory, 2005.

- Offer Full (C4) Professorship on Software Engineering, University of Freiburg, 2004.

- EPSRC Visiting Professorship at the University of Birmingham (UK), 2000–2003.

- 2nd place Associate (C3) Professorship on Formal Methods, University of Bonn, 1998.

- Philips Early Career Development Award, 1988.

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[1]The 2003 IEEE TSE paper Model-Checking Algorithms for Continuous-Time Markov Chains by C. Baier, B. Haverkort, H. Hermanns, and J.-P. Katoen is ranked 74 in the top-100 of most cited papers in software engineering (and ranked 57 in the top-100 when considering number of citations per year). The top-100 was published in Information & Software Technology (2015) and is based on surveying 70,000 papers.

[2]The "University of the Greater Region is a cross-border association of universities funded by the EU INTERREG Programme. It involves the universities of Saarland, Liège (Belgium), Luxembourg, Lorraine (France), Kaiserslautern and Trier (Germany).

Doctoral students

1. Friedrich Gretz (Ph.D, RWTH Aachen, 2015):
   Semantics and Loop-Invariant Synthesis for Probabilistic Programs.
   Currently Researcher at Bosch Research & Development.

2. Falak Sher (Ph.D. RWTH Aachen, 2015):
   Abstraction and Refinement of Probabilistic Automata using Modal Stochastic Games.
   Currently Lecturer at the IT Universityat Lahore (Pakistan).

3. Jonathan Heinen (Ph.D. RWTH Aachen, 2015):
   Verifying Java Programs with Graph Grammars.

4. Arpit Sharma (Ph.D. RWTH Aachen, 2015):
   Reduction Techniques for Nondeterministic and Probabilistic Systems.
   Currently Lecturer at Bhopal University (India).

5. Hongfei Fu (Ph.D. RWTH Aachen, 2014):
   Verifying Probabilistic Systems: New Algorithms and Complexity Results.
   Currently Researcher at ISCAS Beijing (China).

6. Mark Timmer (Ph.D. with distinction, University of Twente, 2013):
   Efficient Modelling, Generation and Analysis of Markov Automata.
   (jointly supervised with Jaco van de Pol and Mariëlle Stoelinga).
   Recipient of the IPA PhD Dissertation Prize 2013 (IPA is the Dutch Institute for Programming research and Algorithmics) and of the Overijssel PhD Award 2014.[3]
   Currently Mathematics Teacher at Salland College, Raalte (The Netherlands).

7. Haidi Yue (Ph.D. RWTH Aachen, 2013):
   Analyzing Energy Consumption of Wireless Networks: A Model-based Approach.

8. Viet Yen Nguyen (Ph.D. RWTH Aachen, 2012):
   Trustworthy Space Craft Design Using Formal Methods.
   Currently Researcher at Fraunhofer IESE, Kaiserslautern (Germany).

9. Alexandru Mereacre (Ph.D. with distinction, RWTH Aachen, 2011):
   Verification of Continuous-Space Stochastic Systems.
   Currently postdoctoral researcher at University of Oxford (UK).

10. Marijn Jongerden (Ph.D. University of Twente, 2010):
    Model-Based Energy Analysis of Battery Powered Systems.
    (jointly supervised with Boudewijn Haverkort).
    Recipient of the GI-MMB Dissertation Award 2011 (German Society of Comp. Science).
    Currently postdoctoral researcher at the University of Twente (NL).

11. Daniel Klink (Ph.D. RWTH Aachen, 2010):
    Three-Valued Abstraction of Stochastic Systems.

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[3]Timmer and Han are the only CS PhD students in Twente that have been awarded the Overijssel PhD Award.

12. Martin Neuhäußer (Ph.D. with distinction, RWTH Aachen and Univ. of Twente, 2010):
    Model Checking Nondeterministic and Randomly Timed Systems.
    Currently senior expert in Formal Verification at Siemens Nürnberg (Germany).

13. Tingting Han (Ph.D. with distinction, RWTH Aachen and University of Twente, 2009):
    Diagnosis, Synthesis, and Analysis of Stochastic Systems.
    Nominated for the GI Dissertation Award 2009 and recipient of the Overijssel PhD
    Award 2010. Currently Lecturer in Computer Science, Department of Computer Science
    and Information Systems, Birkbeck, University of London (UK)

14. Stefan Rieger (Ph.D. RWTH Aachen, 2009):
    Verification of Pointer Programs.
    Currently research scientist at TWT Stuttgart (Germany).

15. Carsten Kern (Ph.D with distinction, RWTH Aachen, 2009):
    Learning Communicating and Nondeterministic Automata.
    Currently Professor at the Regensburg University of Applied Sciences (Germany).

16. Ivan S. Zapreev (Ph.D, University of Twente, 2008):
    Model Checking Markov Chains: Techniques and Tools.
    Currently scientific programmer at CWI (The Netherlands).

17. Dino Distefano (Ph.D, University of Twente, 2003):
    On Model Checking the Dynamics of Object-Based Software: A Foundational Approach.
    (jointly supervised with Arend Rensink).
    Dino was awarded the Royal Academy of Research Fellowship in 2006, the Roger Need-
    ham Award in 2012, and the CAV Award in 2016.
    Currently Full Professor at Queen Mary University, London (UK) and affiliated with
    Facebook.

18. David N. Jansen (Ph.D., University of Twente, 2003):
    Extensions of Statecharts: with Probability, Time, and Stochastic Timing.
    (jointly supervised with Roel Wieringa).
    Currently Assistant Professor at the Radboud University Nijmegen (The Netherlands).

19. Pedro R. D'Argenio (Ph.D., University of Twente, 1999):
    Algebras and Automata for Timed and Stochastic Systems.
    (jointly supervised with Ed Brinksma).
    Currently Associate Professor at the Universidad Nacional de Córdoba (Argentina).

Current doctoral students: Harold Bruintjes, Christian Dehnert, Dennis Guck (Twente),
Christina Jansen, Sebastian Junges, Benjamin Kaminski, Tim Lange, Enno Ruijters (Twente),
Matthias Volk, and Stephen (Hao) Wu.

Software tools

1. STORMDFT, a tool for the efficient state-space generation and quantitative analysis of
   dynamic fault trees (2016).

2. PROPHESY, a tool for parameter synthesis of Markov chains (since 2015)[4].

3. PRINSYS, a tool for synthesizing loop-invariants for probabilistic programs (since 2013).

4. COMPASS, a tool-set for the verification, safety and dependability analysis, and performance analysis of AADL models (since 2009).

5. LIBALF, an open-source library for learning formal languages (since 2010).

6. SMYLE, learning communicating automata from MSCs (since 2007).

7. MRMC, a model checker for Markov reward chains and decision processes (since 2005).

8. MOTOR, a discrete-event simulator for a compositional randomly timed systems (2002-2008).

9. ETMCC, a model checker for continuous-time Markov chains (1999-2004).

Keynote talks

Conferences

1. *International Colloquium on Theoretical Aspects of Computing (ICTAC).* Hanoi, Vietnam, 2017.

2. *Annual Meeting on Formal Methods in Computer Science (FAMC).* Beijing, China, 2016.

3. IEEE Annual Conference on *Logic in Computer Science (LICS).* New York City, USA, 2016.

4. Symposium on *Automata, Logic and Games*, Institute of Mathematical Sciences (IMS), Singapore, 2016.

5. The 4th Conference on *NETworked sYStems (NETYS).* Marrakech, Maroc, 2016.

6. Conference on *Weighted Automata: Theory and Applications (WATA).* Aalborg, Denmark, 2016.

7. *Software-Centric Systems Conference (SC^2).* Eindhoven, The Netherlands, 2016.

8. International Symposium on *Automated Technology for Verification and Analysis (ATVA).* Shanghai, China, 2015.

9. International Conference on *Software Engineering and Formal Methods (SEFM).* Grenoble, France, 2014.

10. 24nd International Conference on *Concurrency Theory (CONCUR).* Buenos Aires, Argentina, 2013.

11. 33rd International Conference on *Application and Theory of Petri Nets and Concurrency (ICATPN) and 12th International Conference on Application of Concurrency to System Design (ACSD).* Hamburg, Germany, 2012.

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[4]Runner up at the CAV 2015 Artifact Evaluation Competition.

12. International Symposium on *Interdisciplinary Modelling of Cyber-Physical Systems (IM-CPS).* Manchester, UK, 2011.

13. 4th International Conference on *Fundamentals of Software Engineering (FSEN).* Tehran, Iran, 2011.

14. 1st *Formal Methods Week (FMWeek).* Eindhoven, The Netherlands, 2009. (joint invited speaker at soiree with E.A. Emerson).

15. 9th Int. Symposium on *Formal Methods for Components and Objects (FMCO).* Eindhoven, 2009.

16. 2nd IFIP/IEEE Int. Symposium on *Theoretical Aspects of Software Engineering (TASE).* Nanjing, China, 2008.

17. 5th Int. Conference on *Formal Methods and Analysis of Timed Systems (FORMATS).* Salzburg, Austria, 2007.

18. 4th Int. Symposium on *Formal Methods for Components and Objects (FMCO).* Amsterdam, 2005.

Invited Tutorial Lectures

1. Symposium on *Automata, Logic and Games*, Singapore, 2016.

2. International Conference on *Computer-Aided Verification (CAV).* San Francisco, USA, 2015.

3. IEEE/ACM International Conference on *Automated Software Engineering (ASE).* Essen, Germany, 2012. Joint tutorial with M. Bozanno and T. Noll.

4. Joint Conference on *Integrated Formal Methods (IFM) & ASM, B and Z Conference (ABZ).* Pisa, Italy, 2012. Joint tutorial with M. Bozzano and V.Y. Nguyen.

5. 11th Conference on *Verification, Model Checking and Abstract Interpretation (VMCAI).* Madrid, Spain, 2010.

6. 3rd IEEE Int. Conference on *Software Engineering and Formal Methods (SEFM).* Koblenz, Germany, 2005. Invited tutorial together with H. Hermanns and D.N. Jansen.

7. IFIP Symposium on *Computer Performance Modeling, Measurement and Evaluation.* Rome, Italy, September 2002. Invited tutorial, jointly with B.R. Haverkort.

8. 12th Int. Conference on *Modelling Tools and Techniques for Computer and Communication System Performance Evaluation.* Invited tutorial, jointly with B.R. Haverkort. London, UK, April 2002.

9. 22nd Int. Conference on *Application and Theory of Petri Nets (ICATPN).* Invited tutorial, jointly with J. Hillston. Newcastle upon Tyne, UK, June 2001.

10. 12th Int. Conference on *Concurrency Theory (CONCUR).* Aalborg, Denmark, 2001. Invited tutorial, jointly with H. Hermanns.

11. Int. Multiconference on *Measurement, Modelling, and Evaluation of Computer-Communication Systems*, Aachen, Germany, September 2001. Invited tutorial.

12. 7th Joint Int. ACM Conference on *Measurement and Modeling of Computer Systems (ACM SIGMETRICS/IFIP Performance)*. Madison, USA, July 1998. Invited tutorial, jointly with H. Hermanns and U. Herzog.

13. Joint Int. Conference on *Formal Description Techniques (IX) and Protocol Specification, Verification and Testing (XVI) (FORTE/PSTV)*. Kaiserslautern, Germany, 1996. Invited tutorial, jointly with D. Latella.

International Workshops

1. Combined 23th International Workshop on Expressiveness in Concurrency *(EXPRESS 2016)* and 13th Workshop on Structural Operational Semantics *(SOS 2016)*, Quebec City, 2016.

2. *Bellairs Workshop on Probabilistic Programming*, Barbados, 2016.

3. *19th Workshop on Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen*, Freiburg, Germany, 2016.

4. *RSS Workshop on Abstraction and Synthesis of Correct-by-Construction Robotics Software*, Rome, Italy, 2015.

5. *20th Anniversary of Tools for the Construction and Analysis of Computer Systems (TACAS)*. Grenoble, France, 2014.

6. *Workshop on Probabilistic and Hybrid System Verification*, Beijing, China, 2013.

7. *3rd Grande Region Security and Reliability Day (GRSRD)*, Luxembourg, 2013.

8. 12th Int. Workshop on *Formal Methods for Industrial Critical Systems (FMICS)*. Trento, Italy, 2011.

9. 5th Int. Workshop on *Reachability Problems (RP)*. Genova, Italy, 2011.

10. ETAPS Workshop on *Hybrid Autonomous Systems (HAS)*. Sarrebruck, Germany, 2011.

11. Workshop on *Automata and Logic for Data Manipulating Programs*. LIAFA Paris, France, 2010.

12. FLOC Workshop on *Modeling, Languages and Analysis of Quantitative Systems (MLQA)*. Edinburgh, Scotland, 2010

13. *Formal Methods for Predictable Embedded Systems.* Aachen, Germany, 2010.

14. Workshop on *Interaction, Concurrency, and Experience (ICE)*. Amsterdam, The Netherlands, 2010.

15. *Formal Methods for Embedded Systems (FMES)*. Eindhoven, The Netherlands, 2009.

16. *Nordic Workshop on Programming Theory (NWPT)*. Copenhagen, Denmark, 2009.

17. IEEE CDC Workshop on *Stochastic Hybrid Systems.* Cancun, Mexico, 2008.

18. 5th Int. Workshop on *Automated Verification of Critical Systems.* Warwick, 2005.

19. IEEE CDC Workshop on *Stochastic Hybrid Systems: Theory and Applications.* Bahamas, 2004.

20. CONCUR Workshop on *Practical Applications of Stochastic Modeling (PASM).* London, UK, 2004.

21. *Bellairs Workshop on Probabilities in Artificial Intelligence.* Barbados, 2004.

22. *10th Anniversary of Tools for the Construction and Analysis of Computer Systems (TACAS).* Barcelona, Spain, 2004.

23. *Workshop on Process Algebra: Open Problems and Future Directions.* Bertinoro, Italy, 2003.

24. *Workshop on Infinite-state Systems and Verification of Quantitative Properties (ISVQP).* Grenoble, France, 2003.

25. FLOC workshop on *Specification, Analysis and Validation for Emerging Technologies in Computational Logic (SAVE).* Copenhagen, Denmark, 2002.

26. Workshop on *Methods for the Verification and Specification of Concurrent and Distributed Systems.* Pisa, Italy, 1996.

Summer Schools

1. NATO Summer School on *Engineering Dependable Software Systems.* Marktoberdorf, 2017.

2. 22th Summer School on *Computer Science (RIO).* Rio Cuarto, Argentina, 2015.

3. Summer School on *Modeling and Verification of Parallel Processes (MOVEP).* Nantes, France, 2014.

4. AVoCS-SPES Summer School on *Model-based Design and Analysis of Cyber-Physical Systems*, Enschede, The Netherlands, 2014.

5. 13th International School on *Formal Methods for the Design of Computer, Communication and Software Systems: Dynamical Systems*, Bertinoro, Italy, 2013.

6. ROCKS Autumn School on *RigorOus dependability analysis using model ChecKing techniques for Stochastic systems*, Vahrn, Italy, 2012.

7. NATO Summer School on *Engineering Dependable Software Systems.* Marktoberdorf, 2012.

8. 4th Summer School on *Verification Technology, Systems & Applications (VTSA).* Liège, Belgium, 2011.

9. 18th Summer School on *Computer Science (RIO).* Rio Cuarto, Argentina, 2011.

10. Summer School on *Model Checking*. Beijing, China, 2010.

11. Summer School on *Modeling and Verification of Parallel Processes (MOVEP)*. Aachen, Germany, 2010.

12. ARTIST-Design Spring School on *Quantitative Model Checking (QMC)*. Copenhagen, Denmark, 2010.

13. Summer School on *Global Computing Approach to Analysis of Systems (GLOBAN)*. Warsaw, Poland, 2008.

14. ARTIST2 Summer School on *MOdelling, TestIng, and Verification for Embedded Systems (MOTIVES)*. Trento, Italy, 2007.

15. ARTIST2 Summer School on *Component Modelling, Testing & Verification and Static Analysis for Embedded Systems*. Nässlingen, Sweden, 2005.

16. *4th International Summer School on Formal Methods: Real-Time Systems (SFM)*. Bertinoro, Italy, 2004.

17. EEF-Summer School on *Formal Methods and Performance Analysis (FMPA)*. Berg en Dal, The Netherlands, 2000.

Distinguished Speaker Series

1. *Festschrift Symposium in Honor of 60th Birthday of Ernst-Rüdiger Olderog.* Oldenburg, Germany, 2015.

2. *Belgian Seminar on Computer Aided Verification.* Brussels, Belgium, 2015.

3. Seminar on the *Opening of the FUNDP Research Centre Fundamentals of Computer Science (FOCUS).* Namur, Belgium, 2012.

4. Workshop on the *15th Anniversary of LSV and Celebration of the CNRS Silver Medal awarded to Jean Goubault-Larrecq.* ENS Cachan, France, 2012.

5. Seminar on the *Opening of the VKR Research Centre of Excellence MT-LAB.* Lyngby University, Denmark, 2009.

6. *German Verification Day (GVD).* Bonn, Germany, 2006.

7. *Workshop in Honor of the Honorary Doctorate of Gerard Holzmann.* University of Twente, 2006.

8. *Inaugural Lecture*, RWTH Aachen University, December 2005.

9. *Dagstuhl Seminar on Probabilistic Methods in Verification and Planning.* Schloß Dagstuhl, Germany, 2003.

10. *Belgian Seminar on Computer Aided Verification.* Brussels, Belgium, 2003.

Computer Science Colloquia at, amongst others: National University Singapore, Chennai Mathematical Institute (India), Jiaotong University (Shanghai, China), Microsoft Research (Cambridge, UK), Queen Mary University (London, UK), NII Shonan Research Centre (Zushi, Japan), TATA Institute for Fundamental Research (Mumbai, India), Chinese Academy of Sciences (Beijing, China), Tsinghua University (Beijing, China), Microsoft Research (Trento, Italy), Saarland University, University of Luxembourg, University of Magdeburg, University of Oldenburg, University of Stuttgart, University of Bremen, ESA Research Center, IRISA Rennes, Aalborg University, Danish Technical University Lyngby, ENS Cachan, Fondazione Bruno Kessler (Trento, Italy), University of Oxford, LFCS Edinburgh, Philips Research Labs, University of Freiburg, University of Münster, IBM Watson Research Laboratories, SUNY at Stony Brook, NASA Langley Research Centre, Caltech, University of California at Santa Cruz, University of Berkeley, University of Illinois at Urbana-Champaign, CWI Amsterdam, Shell Research Laboratories.

University activities

Lecturing

Ph.D. courses: Performance Analysis by Model Checking (IMT Lucca, Italy, 2012 and 2014), Model Checking Markov Chains (Universidad Nacional Rio Cuarto, Argentina, 2011 and 2015), Principles of Model Checking (Chinese Academy of Sciences, 2010, IPA Research School, 2009, Nanjing University and Tsinghua University, China, 2008), Analysis of Probabilistic Systems, (University of Firenze, Italy, 2006), Specification and Validation of Stochastic Systems, University of Birmingham, UK, 2000), Model-Checking Real-Time Systems (University of Pisa, Italy, 1997),

M.Sc. courses: Model Checking, Advanced Model Checking, Modeling and Verification of Probabilistic Systems, Concurrency Theory, Theoretical Foundations of the UML, Communication Protocol Design, Automated Validation of Parallel Systems, System Validation, Tool Architecture.

B.Sc. courses: Algorithms and Data Structures [5], Computability and Complexity Theory, Formal Languages and Automata Theory.

Tutoring: Compiler Construction, Design of Distributed Systems, Formal Specification Techniques, Algorithms and Data Structures, Functional Programming, Automata and Language Theory, Software Engineering Project, Formal Methods for Software Engineering.

Master and Bachelortheses

I supervised about 40–50 Master- and Bachelortheses. Master student Sebastian Junges—supervised by me and M. Stoelinga—received the price for the best Master Thesis in Computer Science 2014/15 in Germany. His work, entitled *Simplifying Fault Trees by Graph Rewriting*, was selected by the Fakultätentag Informatik. He received the price of 2,500 Euro at the 45th Annual Meeting of the German Informatics Society (Gesellschaft fr Informatik e.V. GI).

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[5]Recipient of the "Lehrpreis Informatik RWTH Aachen", 2010.

Membership in Examination Committees

Internal Ph.D. Examiner: J. Romijn (1999), T.C. Ruys (2001), F.J. Sluiman (2002), S. Strubbe (2005), L. Cloth (2007), M. Englert (2008), L. Kaiszer (2008), H. Karstenberg (2008), G. Quiros (2010), C. Li (2010), E. Zambon (2013), T. Ngo Minh (2014), A. Kolesnichenko (2014), X. Zhang (2015), Y. Chen (2015), T. van Dijk (2016).

External Ph.D. Examiner: G. Clarke (Edinburgh, 1999), A.G. Engels (Eindhoven, 2001), M. Bravetti (Bologna, 2001), H.C. Bohnenkamp (RWTH Aachen, 2002), M.I. Stoelinga (Nijmegen, 2002), J. Bengtsson (Uppsala, 2002), J.I. den Hartog (VU Amsterdam, 2002), S. Andova (Eindhoven, 2002), F. Bartels (VU Amsterdam, 2004), J. Meyer-Kayser (Erlangen, 2004), S. Abbes (IRISA Rennes, 2004), S. Cattani (Birmingham, 2005), M. Hendriks (Nijmegen, 2005), L. Cheung (Nijmegen, 2006), A. Mooij (Eindhoven, 2006), S. Johr (Saarland, 2007), J. Markovski (Eindhoven, 2008), M. Größer (TU Dresden, 2008), R. Mak (Eindhoven, 2008), F. Dankar (Ottawa, 2008), F. Horn (Paris 7, 2008), T. Chen (VU Amsterdam, 2009), M. Smith (Edinburgh, 2010), N. Coste (Verimag Grenoble, 2010), B. Delahaye (INRIA Rennes, 2010), J. Berendsen (Nijmegen, 2010), M. Andres (Nijmegen, 2011), A. Classen (Namur, 2011), B. Srivathsan (Bordeaux, 2012), L. Song (IT Copenhagen, 2012), E. Amparore (Torino, 2013), J. Krétinsky (TU Munich, 2013), N. Müllner (Oldenburg, 2014), M. Randour (Mons, 2014), J. Krétinsky (Brno, 2014), R. Kindermann (Aalto University, 2014), M. Shirmohammadi (VU Brussels, 2014), D. Gebler (VU Amsterdam, 2015), M. Swaminathan (Oldenburg, 2015), P. Fournier (Rennes, 2015), Y. Li (Eindhoven, 2016).

External Habilitation Commitees: P. Bouyer (ENS Cachan, 2008), R. Wimmer (University of Freiburg, 2017).

University Committees

- Student member of the Faculty Board of Computer Science, U. Twente, 1986–1987.

- Staff representative in the Faculty Board of Computer Science, U. Twente, 1993–1995.

- Head of Formal Methods and Tools Group, replacing prof.dr. H. Brinksma due to his sabbatical leave, January 2000–August 2000.

- Chairman Examination Board of Telematics at Twente, 2000–2005.

- Member of the Committee on Restructuring the CS Curriculum, 2000.

- Editor of CS Research Evaluation 1996–2001 for the Faculty of Computer Science, 2002.

- Chair Management Team of Formal Methods and Tools Group, 2002–2005.

- Chair Examination Board Computer Science at RWTH Aachen, 2008–now.

- Deputy Chair of the Graduiertenkolleg Algorithmic Synthesis of Discrete Reactive Systems, 2011–now.

- Member of more than ten Selection Committees of Junior, Associate and Full Professorships, 2005–now.

- Chair of Selection Committee Junior-Professor on Theory of Hybrid Systems, 2007.

- Chair of Selection Committee of Full Professor on Parallel Programming, 2009.

- Chair of Selection Committee of Full Professor on Logics and Automata Theory, 2011.

- Chair of Evaluation Committee of Junior-Professor on Theory of Hybrid Systems, 2011.

- Member Selection Committee of Professorship at Free University of Brussels, Belgium, 2012.

- Member Assessment Committee of Associate Professor DTU Lyngby, Denmark, 2012.

- Member Scientific Council of the Doctorate School on Information Engineering, University of Trieste, Italy, 2008–2010.

- Head of Computer Science Department, RWTH Aachen, April 2012–2015.

- Deputy Head of Computer Science Department, RWTH Aachen, since October 2015.

- Treasurer of Computer Science Department, RWTH Aachen, since 2015.

- Member Appointment Committee Max Planck Gesellschaft, 2015.

Professional activities

Membership in Steering Committees

1. Workshop on Probabilistic Methods in Verification (PROBMIV), 1998–2003.

2. Conference on Quantitative Evaluation of Systems (QEST), 2004–2007 (Founding member), 2009-now. Chair of the QEST steering committee since September 2012.

3. European Joint Conference on Theory and Practice of Software (ETAPS), 2001–2003 and 2005–now. Deputy Chair of the ETAPS steering committee 2011–2013. Elected Chair of the ETAPS SC from April 2013 on.

4. Conference on Formal Modeling and Analysis of Timed Systems (FORMATS), 2009–now.

5. Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2011–2013.

6. Conference on Concurrency Theory (CONCUR), 2013–now.

Membership in Program Committees

ARTS (1997 and 1999 [**chair**]), FMICS (1999 and 2007), PROBMIV (1999 and 2001), DSVV (2000 and 2001), Performance Tools (2000, 2002, and 2003), M4M (2001 and 2005), TACAS (2002 [**co-chair**], 2003, 2010, 2013, 2014), FORMATS (2003, 2005, 2008 and 2014), CONCUR (2004, 2010 and 2011 [**co-chair**], 2015), QEST (2004 [**co-chair**]–2007, 2010, 2011 [**general chair**], 2012), ISoLA (2004, 2006, 2010 and 2012), MMB (2006, 2010, 2012, 2014, 2016), PSI (2006, 2009, 2011, 2014, 2015, 2017), NSMC (2006, 2010), QAPL (2006 and 2013), VERIFY (2006, 2007 and 2010), MEMICS (2006), FSTTCS (2006), IFIP PERFORMANCE (2007), DSN (2007 and 2008), SAVCBS (2007), SOFSEM (2009), RP (2010), MOVEP (2010–2016),

FASE (2011), ICALP (2011 and 2016), CAV (2011, 2013, 2015, 2016), FOSSACS (2012), FMICS (2012), CIAA (2012), ATVA (2012–2015), LATA (2013, 2014, 2016, 2017), FSEN (2013–2017), FORTE/FMOODS (2013), IEEE INDIN (2013), SMC (2013), Petri Nets (2014–2016), SEFM (2015), Frontiers of Formal Methods (2015), HSCC (2016), FM (2016), CSL (2017), SafeComp (2017).

Other Review Activities

Panel Computer and Information Science, ERC (2015); Royal Academy of Science (UK); Singapore Ministry of Education; Review panel INRIA Research Centre (2012); Reviewer of Zentralblatt MATH (since 2011); Book referee Cambridge University Press and MIT Press; Advanced and Starting Research Grants, European Research Council (as member of the ERC Review College, 2010–2013); Alexander von Humboldt Stiftung (Germany); Carl-Zeiss Stiftung (Germany); Wittgenstein Award (Austria); Roger Needham Award (BSC, UK); Heinz-Maier Leibniz Preis (DFG, Germany); Icelandic Centre for Research; Luxembourg Science Foundation; Czech Science Foundation; Portuguese Foundation for Science and Technology; Distinguished Postdoctoral Grants (VENI Program, The Netherlands, 2007–2009); German-Israel Foundation for Scientific Research and Development; Dutch Research Council (NWO); German Research Council (DFG); Handbook of Automata Models; Handbook of Process Algebra; Israel Science Foundation; INRIA, France; Vienna Science and Technology Fund; UK Engineering and Physical Sciences Research Council (as member of the EPSRC Review College, 2006–2010); Agence National de la Recherche (ANR), France.

Membership Professional Associations

ACM (Association for Computing Machinery, senior member), ACM Special Interest Group on Logic and Computation (SIGLOG), EATCS (European Association for Theoretical Computer Science), NVTI (Dutch Association for Theoretical Computer Science), GI (German Association for Computer Science), IEEE Computer Society, EASST (European Association of Software Science and Technology), EAPLS (European Association for Programming Languages and Systems).

Journal Editorships

- Member editorial board *PeerJ*, 2015–now.

- Member editorial board *The Scientific World Journal*, Hindawi Publishers, 2012–2013.

- Member editorial board *Journal on Software Tools for Technology Transfer (STTT)*, Springer Verlag, 2011–now.

- Member editorial board *Journal of Software*, Academic Publisher, 2006–2010.

- Guest editor (with B. König) of a special issue of *Logical Methods in Computer Science* on the CONCUR 2011 conference, 2013. `doi: 10.2168/lmcs-concur:2011`.

- Guest editor (with G. Franceschinis and M. Woodside) of a special issue of *IEEE Transactions on Software Engineering* on the QEST 2004 conference, volume **32**(8), 2006.

- Guest editor (with P. Buchholz and M. Verhoef) of a special issue of *Journal of Software Tools for Technology Transfer* (Springer) on the ISOLA 2004 conference, volume **8**(6), 2006.

- Guest editor (with B.R. Haverkort) of a special issue of *ACM SIGMETRICS Performance Evaluation Review*, volume **32**(4), 2005.

- Guest editor (with P. Stevens) of a special issue of *Journal of Software Tools and Technology Transfer* (Springer) on the TACAS 2002 Conference, volume **6**(2), 2004.

- Guest editor (with H. Hermanns) of a special issue of *Journal of Logic and Algebraic Programming* (Elsevier) on Model Checking, volume **52–53**, issue C, 2002.

- Guest editor of a special issue of *Theoretical Computer Science* (Elsevier) on Real-Time and Probabilistic Systems (ARTS'99), volume **282**, 2002.

Event Organizer

- SPRING SCHOOL ON FOUNDATIONS OF PROBABILISTIC PROGRAMMING. Minho, Portugal, May 2017. (jointly organized with A. Silva and G. Barthe).

- FIRST ETAPS WORKSHOP ON LEARNING IN VERIFICATION (LIVE). Uppsala, Sweden, April 2017. (jointly organized with J. Kretinsky).

- MYSURU WORKSHOP ON TRENDS AND CHALLENGES IN QUANTITATIVE VERIFICATION. Mysore, India, February 2016. (jointly organized with S. Akshay, B. Srivathsan, and I. Walukiewicz).

- DAGSTUHL SEMINAR ON PROBABILISTIC PROGRAMMING. Schloß Dagstuhl, Germany, April 2015. (jointly organized with G. Barthe, A. Gordon, and A. McIver).

- WORKSHOP ON NEW AGE CONCURRENCY. Aachen, Germany, March 2014. (jointly organized with M. Müller-Olm, R. Meyer, and H. Wehrheim,).

- DAGSTUHL SEMINAR ON CORRECT AND EFFICIENT ACCELERATOR PROGRAMMING. Schloß Dagstuhl, Germany, April 2013. (jointly organized with A. Cohen, A. Donaldson, and M. Huisman).

- 3RD INTERNATIONAL WORKSHOP ON HYBRID AUTONOMOUS SYSTEMS (HAS). Tallinn, Estonia, March 2012. (jointly organized with M. Bujorianu and E. Frazzoli).

- 6TH INTERNATIONAL SYMPOSIUM ON TRUSTWORTHY GLOBAL COMPUTING (TGC). Aachen, Germany, September 2011.

- 22ND INTERNATIONAL CONFERENCE ON CONCURRENCY THEORY (CONCUR). Aachen, Germany, September 2011. (jointly organized and chaired with B. König).

- 8TH INTERNATIONAL CONFERENCE ON QUANTITATIVE EVALUATION OF SYSTEMS (QEST). Aachen, Germany, September 2011.

- PH.D. SCHOOL ON QUANTITATIVE MODEL CHECKING (QMC). Copenhagen, Denmark, March 2010. (jointly organized with K.G. Larsen).

- FIRST YOUNG RESEARCHERS WORKSHOP AT CONCUR (YR-CONCUR). Bologna, Italy, September 2009.

- ETAPS WORKSHOP ON CORRECTNESS, MODELING AND PERFORMANCE OF AEROSPACE SYSTEMS (COMPASS). York, UK, March 2009. (jointly organized with A. Cimatti).

- WORKSHOP ON LOGICS AND AUTOMATA: HISTORY AND PERSPECTIVES. In honour of the 60th birthday of Wolfgang Thomas. RWTH Aachen, Germany, December 2007.

- SYMPOSIUM TWO DECADES OF PROBABILISTIC VERIFICATION. Lorentz Center, Leiden, The Netherlands, November 2007. (jointly organized with F. Vaandrager, C. Baier, B. Haverkort, H. Hermanns and M. Siegle).

- DAGSTUHL SEMINAR ON QUANTITATIVE ASPECTS OF EMBEDDED SYSTEMS. Schloß Dagstuhl, Germany, March 2007. (jointly organized with L. Thiele and B. Haverkort).

- WORKSHOP ON PROCESS ALGEBRA: THE FIRST 25 YEARS AND BEYOND. Bertinoro, Italy, August 2005. (jointly organized with L. Aceto, A. Gordon and W. Fokkink).

- 1ST INT. CONFERENCE ON QUANTITATIVE EVALUATION OF SYSTEMS (QEST). Enschede, The Netherlands, September 2004. (jointly organized with B. Haverkort).

- GI/DAGSTUHL SEMINAR ON MODEL-BASED TESTING OF REACTIVE SYSTEMS. Schloß Dagstuhl, Germany, January 2004. (jointly organized with M. Broy, B. Jonsson, M. Leucker, and A. Pretschner).

- TOOLS AND ALGORITHMS FOR THE ANALYSIS AND CONSTRUCTION OF SYSTEMS (TACAS). Grenoble, France, April 2002. (jointly chaired with P. Stevens).

- GI/DAGSTUHL SEMINAR ON VALIDATION OF STOCHASTIC SYSTEMS. Schloß Dagstuhl, Germany, December 2002. (jointly organized with C. Baier, B. Haverkort, H. Hermanns, and M. Siegle).

- Symposium on the occasion of 20-YEARS LUSTRUM OF THE COMPUTER SCIENCE STUDIES of the Universities of Twente, Eindhoven and Delft, October 2001.

- DUTCH MODEL CHECKING DAY, Enschede, The Netherlands, January 2001. (jointly organized with E. Brinksma).

- EURO/EEF-SUMMER SCHOOL ON FORMAL METHODS AND PERFORMANCE ANALYSIS (FMPA). Berg en Dal, The Netherlands, July 2000. (jointly organized with E. Brinksma and H. Hermanns).

- 5TH INT. AMAST WORKSHOP ON REAL-TIME AND PROBABILISTIC SYSTEMS (ARTS). Bamberg, Germany, May 1999.

Membership of Boards

- Chairman of the ETAPS e.V. Association, since 2015.

- Project-leader of the NWO-DFG bilateral project Validation of Stochastic Systems (VOSS), 2001–2007.

- Board member of the Dutch Society for Theoretical Computer Science (NVTI), 2005–2013.

- Member NWO evaluation committee VENI proposals, 2007–2009.

- Project-leader of ESA Project Correctness Modelling and Performance of Aerospace Systems (COMPASS), 2008–2010.

- Member EPSRC Review College, 2006–2010.

- Member Board of Doctorate School on Information Engineering, University of Trieste, Italy, 2007–now.

- Member Scientific Board Research Centre FOCUS at the University of Namur, Belgium, 2010–now.

- Vice-chairman of the Research Training Group on Algorithmic Synthesis of Discrete- and Continuous Reactive Systems (ALGOSYN), 2011–2015.

Research grants

Research Funding

1. DFG Project on *Automated Analysis of Concurrent Pointer Programs*, (Together with T. Noll, RWTH) 2015–2017, 185 KEuro.

2. BMBF KMU-Verbundprojekt, *Highly Robust Wireless Communication for Industrial Applications*, 2014–2017, about 125 Keuro.

3. Distinguished Professorship, DFG Excellence Programme, *Automating Probabilistic Program Analysis*, 2013–2017, about 670 Keuro.

4. Theodore von Kármán Fellowship, DFG Excellence Programme, together with a DFG Collaboration Initiator Grant, 2013, 18 Keuro.

5. Siemens/RWTH Aachen Project on *Verifying PLC Programs*, 2013–2017, 380 KEuro.

6. European Space Agency (ESA), *Hardware Software Development for Launchers* (HAS-DEL), 2012–2014, 100 KEuro.

7. FP7 Programme European Commission, *Distributed MILS for Dependable Information and Communication Infrastructures*, (S. Hansen, The Open Group, PI), 2012–2015, about 320 Keuro.

8. FP7 Programme European Commission, *Self Energy-Supporting Autonomous Computation* (SENSATION), (K.G. Larsen, Aalborg University, PI), 2012–2015, about 300 KEuro.

9. Dutch Science and Technology Foundation (STW), *smARt RAilroad maintenance eNGinEERing with stochastic model checking (ARRANGEER)* (together with M. Stoelinga, U. Twente), 2012–2016, 500 Keuro.

10. ATL Microsoft/RWTH Aachen Project on *Optimizing Energy Consumption in an Automotive Environment*, 2011–2012, 100 KEuro.

11. EU Marie Curie Programme International Research Staff Exchange Scheme (IRSES), *Mobility between Europe and Argentina applying Logics to Systems* (MEALS), (H. Hermanns, Saarland University, PI), 2012–2016, 50 Keuro.

12. FP7 Programme European Commission, *Correct and Efficient Accelerator Programming* (CARP), (A. Donaldson, Imperial College, PI) 2011–2014, 280 KEuro.

13. German Research Council (DFG), *Counterexample Generation for Stochastic Models by Bounded Model Checking (CeBUG)*, (together with B. Becker, Freiburg and E. Abráhám, RWTH), 2010-2013, 200 KEuro.

14. Dutch Research Council (NWO), *Efficient Multi-Core Model Checking* $(E(MC)^2)$, (D. Boshnacki, TU Eindhoven, PI) 2009-2013, 100 KEuro.

15. FP7 Programme European Commission, *Modeling and Verification of Stochastic Hybrid Systems* (MOVES), (J. Lygeros, ETH Zurich, PI) 2010–2013, 310 KEuro.

16. NPI Programme European Space Agency (ESA), *Extending and Improving Formal Methods for System/Software Co-Engineering*, 2010–2012, 90 KEuro.

17. Dutch Research Council (NWO), *Symbolic Reduction of Probabilistic Models* (SYRUP), 2009–2013, 190 KEuro.

18. Bilateral DFG-NWO research programme, *Rigorous Dependability Analysis using Stochastic Model Checking Techniques* (ROCKS), 2009-2012, 110 KEuro.

19. Excellence Initiative German Research Council (DFG), *Junior Professorship on Theory of Hybrid Systems*, 2008–2013, 980 KEuro.

20. European Space Agency (ESA), *Correctness, Modeling and Performance of Aerospace Systems* (COMPASS), 2008–2011, 560 KEuro.

21. FP7 Programme European Commission, *Quantitative Aspects in Model-Driven Embedded System Design* (QUASIMODO), (K.G. Larsen, Aalborg, DK, PI), 2008–2011, 220 KEuro.

22. Excellence Cluster Programme of the German Research Council (DFG), *Ultra High-Speed and Mobile Communication* (UMIC), (G. Ascheid, RWTH, PI), 2005–2010, 200 KEuro.

23. Research Training Group funded by the German Research Council (DFG), *Algorithmic Synthesis of Reactive Systems* (ALGOSYN), (W. Thomas, RWTH, PI), 2005–now, 600 KEuro.

24. Dutch Research Council (NWO), *Verifying Quantitative Properties of Embedded Systems* (QUPES), 2005–2009, 368 KEuro.

25. Bilateral DFG-NWO research programme, *Validation of Stochastic Systems 2* (VOSS 2), 2005–2008, 100 KEuro.

26. Dutch Research Council (NWO), *Model Checking of Infinite-State Markov Chains* (MC = MC), 2003–2007, 343 KEuro. (joint project with B. Haverkort).

27. Bilateral DFG-NWO research programme, *Validation of Stochastic Systems* (VOSS), 2001–2004, 75 KEuro.

28. Dutch Research Council (NWO), *Specification-based Performability Checking* (SPACE), 2000–2003, 125 KEuro.

29. German Research Council (DFG), *Automated Verification of Quality-of-Service Aspects of Distributed Systems*, (U. Herzog, Erlangen, PI), 1998–2001, 175 KEuro.

30. Deutsche Akademische Austausch Dienst (DAAD), *Stochastic Modelling and Verification* (U. Herzog, Erlangen, PI), 1998–2001, 15 KEuro.

31. CNR-CNUCE (Italy), *Event Structures Quantitative, Simulazione Discreta e Modelli per la Performance*, (D. Latella, CNUCE, PI), 1997–1999, 15 KEuro.

32. CNR-CNUCE (Italy), *EStensione Probabilistiche e Temporali dell'algebra di processi LOTOS bassate su strutture di eventi, per la specifica e analisi quantitative di sistemi distribuiti*, (D. Latella, CNUCE, PI), 1994–1996, 15 KEuro.

For joint projects, the above indicated funding refers to **my** part of the funding, and do not indicate the total budget of the project. The total funding acquired is about **7.8 million Euro**.

Publications

Katoen published more than **150** reviewed conference papers and more than **60** journal papers. According to Google Scholar (September 2016), his publications received **13,150** citations in total. His Hirsch-index is **50**. A researcher with Hirsch-index n has published n papers each of which has been cited by others at least n times. Microsoft Academic ranks me at position 1,500 in the list of most cited authors in Computer Science of all time. Joost-Pieter Katoen co-authored with Christel Baier the textbook "Principles of Model Checking" (2008, MIT Press). This book is the one-but-most cited work in model checking (with about **2900** citations), and is the best-seller in the field according to Amazon sales ranks.

Ten major publications are:

1. B. L. KAMINSKI, J.-P. KATOEN, C. MATHEJA, AND F. OLMEDO. *Weakest Precondition Reasoning for Expected Run-Times of Probabilistic Programs.* In: **European Symp. of Programming**, volume 9632 of LNCS, pages 364–389, Springer, 2016 (EATCS Best Theory Paper Award.)

2. J.-P. KATOEN, L. SONG, AND L. ZHANG. *Probably Safe or Live.* In: **Computer Science Logic and Logic in Computer Science (CSL-LICS)**, pages 55:1–55:10, ACM, 2014.

3. M. Bozzano, A. Cimatti, <u>J.-P. Katoen</u>, V. Y. Nguyen, T. Noll, and M. Roveri. *Safety, Dependability, and Performance Analysis of Extended AADL Models.* In: **The Computer J.**, 54(4): 754–775, 2011.

4. T. Chen, T. Han, <u>J.-P. Katoen</u>, and A. Mereacre. *Model Checking of Continuous-Time Markov Chains against Timed Automata Specifications.* In: **Logical Methods in Computer Science**, 7(1), 2011.

5. B. Bollig, <u>J.-P. Katoen</u>, C. Kern, and M. Leucker. *Learning Communicating Automata from MSCs.* In: **IEEE Transactions on Software Engineering**, 36(3): 390–408, 2010.

6. C. Baier and <u>J.-P. Katoen</u>. *Principles of Model Checking.* The MIT Press, 2008.

7. P. R. D'Argenio, and <u>J.-P. Katoen</u>. *A Theory of Stochastic Systems. Part I: Stochastic Automata.* In: **Information and Computation**, 203(1): 1–38, 2005.

8. D. Distefano, <u>J.-P. Katoen</u>, and A. Rensink. *Who is Pointing When to Whom? – On the Automated Verification of Linked List Structures.* In: **Foundations of Software Technology and Theoretical Computer Science (FSTTCS)**, volume 3328 of LNCS, pages 250–262, Springer-Verlag, 2004.

9. C. Baier, B. R. Haverkort, H. Hermanns, and <u>J.-P. Katoen</u>. *Model-Checking Algorithms for Continuous-Time Markov chains.* In: **IEEE Transactions on Software Engineering**, 29(6): 524–541, 2003.

10. A. Nymeyer and <u>J.-P. Katoen</u>. *Code Generation based on Formal Bottom-up Rewrite Systems Theory and Heuristic Search.* In: **Acta Informatica**, 34(4): 597–635, 1997.

A full list of publications is available at:

http://www-i2.informatik.rwth-aachen.de/~katoen/pubs.php?al=no

Curriculum Vitae
Francesco Ricci

Personal information	Name: Francesco Ricci Belonging to faculty: Computer Science Telephone: • Mobile: +39 331 6742956 • Private: +39 0461 811194 • Office: +39 0471 016971
Education since leaving school	• 1983 Laurea in Matematica; University of Padova
Present appointment	Professore Ordinario (Starting: October 2006) Free University of Bozen-Bolzano • I am dean of the Faculty of Computer Science, leader of the research group on Recommender Systems (within the research area "Information and Database Systems Engineering.
Professional experience	Chronological list of all previous employments (each with job title, starting and finishing dates, level, employer, responsibilities)

From / to	Job title	Name of academic Institution	Academic level	responsibilities
7/2000	9/2006	ITC-irst, Trento, Italy	Director of Research Center: Electronic Commerce and Tourism Research Laboratory	Define research directions; Acquire external funding; Supervise the R&D work of up to 17 staff members.
7/1998	7/2000	Sodalia S.p.A.	System Architect	Development of company web application model; Consultancy to other Telecom companies; Distributed systems projects

				coordination.
1/1988	7/2000	ITC-irst, Trento, Italy	Researcher	Coordination of several research groups; Research in Artificial Intelligence; Acquisition of external funding.
9/1986	7/1998	Enichem S.p.A.	Software Analyst and Programmer	Design and development of expert systems and office automation applications.

Research and scholarships with a precise indication of the dates

Francesco Ricci, staring from 2006, when he started his appointment as associate professor at Free University of Bozen-Bolzano, has created in Bolzano a reference centre for the research on Recommender Systems (RS). The projects described below are all focused on the development of new methodologies and techniques to design context-aware, mobile, information search and recommendation solutions, applied to the domains of health, tourism and music.

Date granted	Award Holder(s)	Funding Body	Title	Amount received
2013-2015	Principal Investigator	CRC	Life-logging for Proactive Advisory Systems	43.000
2013-2014	Principal Investigator	Stallegenes S.p.A	Monitoraggio e supporto di pazienti affetti da rinite allergica	4.000
2013-2015	Principal Investigator	Province BZ funding	Magellano	40.000
2013-2014	Principal Investigator	Municipality of Bozen-Bolzano	Map-Based Routing Visualization and Predictive Model of the Parking Occupancy State - Bolzano Traffic	30.000
2012-2014	Principal Investigator	CRC	Supporting Sequential Item Selection with Recommendations	23.500
2011-2014	Principal Investigator	Province BZ funding	Sistemi Proattivi di Accesso alle Informazioni	40.000
2011-	Principal	CRC	Contextualizing	35.000

2013	Investigator		Personalized Recommendations	
2009-2011	Principal Investigator	Deutsche Telekom	RECOM 1 & 2	55.000
2009-2012	Principal Investigator	Province BZ funding	Mobile Analytical Services for Medical Data Warehouses	125.000
2008-2010	Principal Investigator	CRC	Real-Time Recommendation Revision and Explanation for a Network of Mobile Users	25.000
2008-2009	Principal Investigator	CRC	Cleansing of Short Strings in Databases Containing Personal Data	17.000
2007-2009	Principal Investigator	CRC	Adaptive data processing and analysis techniques in eGovernment	40.500

In 2013 I was the coordinator of the research area "Information Systems and Database Engineering" of the faculty of Computer Science (Free University of Bozen-Bolzano).

Interdisciplinary scientific collaborations over the past three years.

Organization of the interdisciplinary "International Workshop on Decision Making and Recommender Systems 2014", Free University of Bozen-Bolzano, September 2014, with the participation of psychologists and economists together with computer scientists.

My research interests focus, among other subjects, on the application of CS to tourism. In this context I have co-chaired:

1. ENTER 2012 International Conference on Information and Communication Technologies in Tourism - ENTER 2012, Helsingborg Sweden 24th to 27th January 2012.
2. ENTER 2011 International Conference on Information and Communication Technologies in Tourism - ENTER 2011, Innsbruck, Austria, 26-28 January, 2011.

And I am editor in chief of the Springer Journal: International Journal of Information Technology and Tourism. This is the first scientific interdisciplinary journal focusing on the role of information technology within the context of tourism, travel and hospitality.

http://www.springer.com/business+&+management/business+information+systems/journal/40558

I am member of International Federation of IT and Travel and Tourism (http://www.ifitt.org/). IFITT is the leading independent global community for the discussion, exchange and development of knowledge about the use and impact of new information and communication technologies (ICT) in the travel and tourism industry.

Invited Seminars and Keynotes

1. Recommender Systems, (invited talk), Club IT, organized by Wirtshaftskammer Wien, September 15th, TU Vienna (in conjunction with RecSys 2015).

2. Recommender Systems, (invited seminar), IFITT Doctoral school, Modul University, June 21st, Vienna.

3. Recommender Systems, (invited talk), Research meets Business, organized by Fakultät für Informatik und Sektion ICT des Unternehmerverbandes, at University of Bozen-Bolzano, June 12, 2015.

4. Context-Aware Computing: Sfide ed Opportunità, (invited talk) during the event "Laboratorio sul futuro: Esigenze formative e di personale specializzato nel settore dei servizi IT", Bolzano (ACS Data Systems S.p.A.) May 5th 2015.

5. Context and Recommendations: Challenges and Results, (invited talk), 26th GI-Workshop Grundlagen von Datenbanken, Bozen-Bolzano, Italy, October 21st to 24th, 2014.

6. Engaging Users with Situational Recommendations: Challenges and Results, (keynote speaker), IIiX 2014, The 5th Information Interaction in Context Conference, Regensburg, August 29, 2014.

7. Group Recommender Systems: Rank Aggregation and Balancing Techniques, (invited seminar), Barcelona Digital Technology Centre (BDigital), June 12, 2014.

8. Future Research Issues in IT and Tourism, (invited talk), ENTER 2014 Conference, Dublin, January 22, 2014.

9. Optimal Radio Channel Recommendations with Explicit and Implicit Feedback, (keynote speaker), Epilog Conference, Vienna, Technical University of Vienna, June 13, 2013.

10. Group Recommender Systems: Rank Aggregation and Balancing Techniques, (invited seminar), University of Lubiana, Faculty of Electrical Engineering, April 26th, 2013.

11. Contextualizing recommendations (keynote speaker), ACM RecSys Workshop on Context-Aware Recommender Systems (CARS '12), In conjunction with the 6th ACM Conference on Recommender Systems), September 9, 2012 - Dublin, Ireland.

12. Contextualizing useful recommendations (keynote speaker), The 20th conference on User Modeling, Adaptation, and Personalization — UMAP 2012, Montreal, July 16-20, 2012.

13. Context-Aware Music Recommender Systems (keynote speaker) AdMIRe 2012: 4th International Workshop on Advances in Music Information

Research: "The Web of Music" in conjunction with the 21st International World Wide Web Conference. Lyon, France, 17th April 2012.

14. Leveraging Context-Awareness in Recommender Systems (Invited Seminar), University of Trento, Department of Computer and Management Science, October 17th, 2011.

15. Leveraging Context-Awareness in Tourism Mobile Applications, (Invited talk), International Seminar on New Media Analysis and Strategies for Tourism Marketing Organizations, September 15-16, 2011, Modul University, Vienna.

16. Context-Aware Recommender Systems (invited seminar), University of Varazdin, Faculty of Organization and Informatics, June 13, 2011.

Best Papers Awards

Second best paper: Matthias Braunhofer and Francesco Ricci: Contextual Information Elicitation in Travel Recommender Systems. In Proceedings of the International Conference in Bilbao, Spain, February 2-5, 2016, Springer, ISBN 978-3-319-28230-5: 579-592

Second best paper: Marius Kaminskas, Ignacio Fernández-Tobías, Francesco Ricci and Ivan Cantador: Ontology-based Identification of Music for Places. In Proceedings of the International Conference in Innsbruck, Austria, January 22-25, 2013, Springer, ISBN 978-3-642-36309-2: 436-447

Best paper of the year award: Tariq Mahmood, Francesco Ricci, and Adriano Venturini. Improving Recommendation Effectiveness by Adapting the Dialogue Strategy in Online Travel Planning. International Journal of Information Technology and Tourism, 11 (4):285-302, 2010.

Best paper award: Walid Trabelsi, Nic Wilson, Derek Bridge, and Francesco Ricci. Comparing Approaches to Preference Dominance for Conversational Recommenders. In Proceedings of the 22th International Conference on Tools with Artificial Intelligence. Arras, France, October 27-29, 2010: 113-120.

Award, Spin-offs, software artifacts, patents and entrepreneurship

Recommendation technologies developed by the research group of F. Ricci have been sold to Deutsche Telekom, within a project funded by this company (Feb 2010 - Feb 2011).

As a result of research conducted on IT and Tourism when I was the director of Electronic Commerce and Tourism Lab in Trento I started a spin-off company. I am a shareholder of that company; selling IT solutions and services to the IT&Tourism market.

Edited Books and Journals

1. Mouzhi Ge, Francesco Ricci: Proceedings of the 2nd International Workshop on Decision Making and Recommender Systems, Bolzano, Italy, October 22-23, 2015. CEUR Workshop Proceedings 1533, CEUR-WS.org 2015

2. Panagiotis Bouros, Neal Lathia, Matthias Renz, Francesco Ricci, Dimitris Sacharidis: Proceedings of the Workshop on Location-Aware

Recommendations, LocalRec 2015, co-located with the 9th ACM Conference on Recommender Systems (RecSys 2015), Vienna, Austria, September 19, 2015. CEUR Workshop Proceedings 1405, CEUR-WS.org 2015

3. Francesco Ricci, Kalina Bontcheva, Owen Conlan, Séamus Lawless: User Modeling, Adaptation and Personalization - 23rd International Conference, UMAP 2015, Dublin, Ireland, June 29 - July 3, 2015. Proceedings. Lecture Notes in Computer Science 9146, Springer 2015, ISBN 978-3-319-20266-2

4. Francesco Ricci, Lior Rokach, Bracha Shapira: Recommender Systems Handbook. Springer 2015, ISBN 978-1-4899-7636-9

5. Mouzhi Ge, Francesco Ricci: Proceedings of the First International Workshop on Decision Making and Recommender Systems (DMRS2014), Bolzano, Italy, September 18-19, 2014. CEUR Workshop Proceedings 1278, CEUR-WS.org 2014

6. Vania Dimitrova, Tsvi Kuflik, David Chin, Francesco Ricci, Peter Dolog, Geert-Jan Houben (Eds.): User Modeling, Adaptation, and Personalization - 22nd International Conference, UMAP 2014, Aalborg, Denmark, July 7-11, 2014. Proceedings. Lecture Notes in Computer Science 8538, Springer 2014, ISBN 978-3-319-08785-6

7. Li Chen, Marco de Gemmis, Alexander Felfernig, Pasquale Lops, Francesco Ricci, Giovanni Semeraro, Martijn C. Willemsen (Eds.): Proceedings of the 3rd Workshop on Human Decision Making in Recommender Systems in conjunction with the 7th ACM Conference on Recommender Systems (RecSys 2013), Hong Kong, China, October 12, 2013. CEUR Workshop Proceedings 1050, CEUR-WS.org 2013

8. Marco de Gemmis, Alexander Felfernig, Pasquale Lops, Francesco Ricci, Giovanni Semeraro, Martijn Willemsen. Decisions@Recsys 2012, Human Decision Making in Recommender Systems (Eds.). Proceedings of the 2nd Workshop on Human Decision Making in Recommender Systems, in conjunction with the 6th ACM Conference on Recommender Systems (RecSys 2012). Dublin, Ireland, September 9, 2012. CEUR vol-893

9. Bern Ludwig, Francesco Ricci, Zerrin Yumak, Nava Tintarev, Rong Hu, Pearl Pu (Eds.). Joint Proceedings of the First International Workshop on Recommendation Technologies for Lifesytle Change (LIFESTYLE 2012) and the First International Workshop on Interfaces for Recommender Systems (InterfaceRS 2012). Workshops at the 6th ACM Conference on Recommender Systems, RECSYS 2012 Dublin, Ireland, September 13, 2012. CEUR vol-891

10. Fuchs, Matthias; Ricci, Francesco; Cantoni, Lorenzo (Eds.) Information and Communication Technologies in Tourism 2012, Proceedings of the International Conference in Helsingborg, Sweden, January 24-27, 2012, XIV, 530 p. 87 illus. Softcover, ISBN 978-3-7091-1141-3

11. Rob Law, Matthias Fuchs, Francesco Ricci (Eds.). Information and Communication Technologies in Tourism 2011, Proceedings of the International Conference in Innsbruck, Austria, January 26-28, 2011. 1st Edition., 2011, XVI, 610 p. 129 illus., Softcover, ISBN: 978-3-7091-0502-3

12. Francesco Ricci, Lior Rokach, Bracha Shapira, Paul B. Kantor (Eds**.).** Recommender Systems Handbook**.** 1st Edition. Springer. 2011, 845 p. 20 illus., Hardcover, ISBN: 978-0-387-85819-7

13. Markus Zanker, Francesco Ricci, Dietmar Jannach, Loren G. Terveen. Special issue on Measuring the Impact of Personalization and Recommendation on User Behaviour. International Journal of Humamn-Computer Studies Vol 68 (issue 8), 2010. Impact Factor: 1.415, 5-year impact factor 2.003

14. Pearl Pu, Derek Bridge, Bamshad Mobasher and Francesco Ricci. Proceedings of the 2008 ACM conference on Recommender systems, Lausanne, Switzerland, ACM.

15. Francesco Ricci and Hannes Werthner (eds). Special Issue of the International Journal of Electronic Commerce on Recommender Systems, Volume 11, Number 2, 2006. Impact Factor 1.550

16. Hector Munoz-Avila and Francesco Ricci. Case-Based Reasoning Research and Development. 6th International Conference on Case-Based Reasoning, ICCBR 2005, Chicago, IL, USA, August 23-26, 2005, Proceedings. Series: Lecture Notes in Computer Science. Subseries: Lecture Notes in Artificial Intelligence, Vol. 3620. 2005, XV, 654 p., ISBN: 3-540-28174-6

17. Francesco Ricci e Joaquin Delgado (eds). Special issue of Information Technology and Tourism, on Travel Recommender Systems, Volume 6, Number 3, 2004. Pages 155-227. Cognizant Communication Corporation.

Chapters in Books

18. Francesco Ricci, Lior Rokach, Bracha Shapira: Recommender Systems: Introduction and Challenges. Recommender Systems Handbook 2015: 1-34

19. Francesco Ricci. Recommender Systems: Models and Techniques. In Encyclopedia of Social Network Analysis and Mining. Alhajj, Reda, Rokne, Jon (Eds.). Springer. 2014. ISBN 978-1-4614-6169-2

20. Francesco Ricci, Lior Rokach, Bracha Shapira. Introduction to Recommender Systems Handbook. In Ricci, F.; Rokach, L.; Shapira, B.; Kantor, P.B. (Eds.), Recommender Systems Handbook. Pages 1-35. Springer. 2011. ISBN: 978-0-387-85819-7

21. Linas Baltrunas and Francesco Ricci. Item Weighting Techniques for Collaborative Filtering. In Knowledge Discovery Enhanced with Semantic and Social Information. Pages 109-126. Springer. 2009. ISBN 978-3-642-01891-6

22. Francesco Ricci, Quang Nhat Nguyen, and Olga Averianova. Exploiting a map-based interface in conversational recommender systems for mobile travelers. In Sharda, N. (Ed.), Tourism Informatics: Visual Travel Recommender Systems, Social Communities, and User Interface Design. Information Science Reference. 2009. ISBN-10: 1605668184

23. Francesco Ricci and Adriano Venturini. eCTRL Solutions: Trip@dvice Technology. In eTourism case studies: management and marketing issues

in eTourism (ETourism Case Studies). Roman Egger and Dimitrios Buhalis (Eds.). Butterworth-Heinemann, 2008. ISBN-13: 978-0750686679.

24. Francesco Ricci, Dario Cavada, Nader Mirzadeh, Adriano Venturini, Case-Based Travel Recommendations. In Daniel R. Fesenmaier, Hannes Werthner and Karl Wöber (Eds.), Travel Destination Recommendation Systems: Behavioral Foundations and Applications, pages 67-93, CAB Publishing, 2006. ISBN 9780851990231

25. Francesco Ricci, Daniel R. Fesenmaier, Nader Mirzadeh, Hildegard Rumetshofer, Erwin Schaumlechner, Adriano Venturini, Karl Wöber and Andreas Zins, DIETORECS: a Case-Based Travel Advisory System. In Daniel R. Fesenmaier, Hannes Werthner and Karl Wöber (Eds.), Travel Destination Recommendation Systems: Behavioral Foundations and Applications, pages 227-239, CAB Publishing, 2006. ISBN 9780851990231

26. Francesco Ricci and Quang Nhat Nguyen, MobyRek: A Conversational Recommender System for On-the-move Travelers. In Daniel R. Fesenmaier, Hannes Werthner and Karl Wöber (Eds.), Travel Destination Recommendation Systems: Behavioral Foundations and Applications, CAB Publishing, 2006. ISBN 9780851990231

27. Fabiana Lorenzi and Francesco Ricci, Case-Based Recommender Systems: a Unifying View, in Bamshad Mobasher and Sarabjot Anand (Eds.), Intelligent Techniques for Web Personalization, Pages 89-113, Springer Verlag, 2005. ISBN 978-3-540-29846-5

28. Fabiana Lorenzi and Francesco Ricci. Case-Based Recommender Systems, in J.Wang (Ed.), The Encyclopedia of Data Warehousing and Mining, Idea Group Publishing, Pages 124-128, 2005. ISBN 978-0123750433

29. Francesco Ricci, and Fabio Del Missier. Supporting Travel Decision Making through Personalized Recommendation. In Clare-Marie Karat, Jan Blom, and John Karat (Eds.), Designing Personalized User Experiences for eCommerce. 2004. 221-251. Kluwer Academic Publisher. ISBN 978-1-4020-2148-0

Journal Publications

30. Victor Codina, Francesco Ricci, Luigi Ceccaroni: Distributional semantic pre-filtering in context-aware recommender systems. User Model. User-Adapt. Interact. 26(1): 1-32 (2016)

31. Ignacio Fernández-Tobías, Matthias Braunhofer, Mehdi Elahi, Francesco Ricci, Iván Cantador: Alleviating the new user problem in collaborative filtering by exploiting personality information. User Model. User-Adapt. Interact. 26(2-3): 221-255 (2016)

32. Hannes Werthner, Aurkene Alzua-Sorzabal, Lorenzo Cantoni, Astrid Dickinger, Ulrike Gretzel, Dietmar Jannach, Julia Neidhardt, Birgit Pröll, Francesco Ricci, Miriam Scaglione, Brigitte Stangl, Oliviero Stock, Markus Zanker: Future research issues in IT and tourism. J. of IT & Tourism 15(1): 1-15 (2015)

33. Matthias Braunhofer, Mehdi Elahi, Francesco Ricci: Techniques for cold-starting context-aware mobile recommender systems for tourism.

Intelligenza Artificiale 8(2): 129-143 (2014)

34. Marius Kaminskas, Ignacio Fernández-Tobías, Francesco Ricci, Iván Cantador: Knowledge-based identification of music suited for places of interest. Journal of Information Technology & Tourism 14(1): 73-95 (2014)

35. Linas Baltrunas, Francesco Ricci: Experimental evaluation of context-dependent collaborative filtering using item splitting. User Modeling and User-Adapted Interaction 24(1-2): 7-34 (2014). Impact factor 1.929

36. Nicola Di Mauro, Paolo Frasconi, Fabrizio Angiulli, Davide Bacciu, Marco de Gemmis, Floriana Esposito, Nicola Fanizzi, Stefano Ferilli, Marco Gori, Francesca A. Lisi, Pasquale Lops, Donato Malerba, Alessio Micheli, Marcello Pelillo, Francesco Ricci, Fabrizio Riguzzi, Lorenza Saitta, Giovanni Semeraro: Italian Machine Learning and Data Mining research: The last years. Intelligenza Artificiale 7(2): 77-89 (2013)

37. Li Chen, Marco de Gemmis, Alexander Felfernig, Pasquale Lops, Francesco Ricci, Giovanni Semeraro. Human Decision Making and Recommender Systems. ACM Transactions on Interactive Intelligent Systems, Vol. 3, No. 3, 2013. Average citations per article 1.47

38. *** Mehdi Elahi, Francesco Ricci, Neil Rubens. Active Learning Strategies for Rating Elicitation in Collaborative Filtering: a System-Wide Perspective. ACM Transaction on Intelligent Systems and Technology, 5(1): 13 (2013)

39. *** Matthias Braunhofer, Marius Kaminskas, Francesco Ricci. Location-aware music recommendation. International Journal of Multimedia Information Retrieval. DOI 10.1007/s13735-012-0032-2 2(1): 31-44 (2013)

40. Marius Kaminskas, Francesco Ricci. Contextual music information retrieval and recommendation: state of the art and challenges. Computer Science Review. 6 (2012) pp. 89-119, DOI: 10.1016/j.cosrev.2012.04.002, Source Normalized Impact per Paper (SNIP): 2.551

41. Shlomo Berkovsky, Tsvi Kuflik, Francesco Ricci: The impact of data obfuscation on the accuracy of collaborative filtering. Expert Systems with Applications 39(5): 5033-5042 (2012). Impact Factor 1.854, 5-Year Impact Factor: 2.339

42. *** Linas Baltrunas, Bernd Ludwig, Stefan Peer, and Francesco Ricci. Context relevance assessment and exploitation in mobile recommender systems. Personal and Ubiquitous Computing. 16(5): 507-526 (2012), Impact Factor 1.133

43. Gedas Adomavicius, Bamshad Mobasher, Francesco Ricci, Alexander Tuzhilin. Context-Aware Recommender Systems. AI Magazine. 32(3): 67-80. 2011. Impact Factor 0.73 (from Research Gate)

44. *** Walid Trabelsi, Nic Wilson, Derek Bridge, Francesco Ricci. Preference Dominance Reasoning for Conversational Recommender Systems: A Comparison Between a Comparative Preferences and a Sum of Weights Approach. International Journal on Artificial Intelligence Tools. 20(4): 591-616. 2011.

45. Francesco Ricci. Mobile Recommender Systems, International Journal of Information Technology and Tourism. 12(3): 205-231, 2011.

46. Fabian Lorenzi, Ana L.C. Bazzan, Mara Abel, Francesco Ricci. Improving recommendations through an assumption-based multiagent approach: An application in the tourism domain. Expert Systems with Applications. 38: 14703–14714. 2011. Impact Factor 1.854, 5-Year Impact Factor: 2.339

47. Markus Zanker, Francesco Ricci, Dietmar Jannach, Loren G. Terveen: Measuring the impact of personalization and recommendation on user behaviour. International Journal on Human-Computer Studies 68(8): 469-471, 2010. Impact Factor: 1.415, 5-year impact factor 2.003

48. Fabiana Lorenzi, Gabriel Baldo, Rafael Costa, Mara Abel, Ana Bazzan, and Francesco Ricci. A Trust Model for Multiagent Recommendations. Journal of Emerging Technologies in Web Intelligence. 2(4): 310-318, 2010.

49. Tariq Mahmood, Francesco Ricci, and Adriano Venturini. Improving Recommendation Effectiveness by Adapting the Dialogue Strategy in Online Travel Planning. International Journal of Information Technology and Tourism, 11 (4):285-302, 2010. BEST PAPER of vol. 11 award

50. Shlomo Berkovsky, Tsvi Kuflik, and Francesco Ricci. P2P case storage and retrieval with an unspecified ontology. Artificial Intelligence Review, vol. 28 (3), pp. 227-255, 2007. (published online April 2009) Impact factor 1.565

51. Shlomo Berkovsky, Tsvi Kuflik, and Francesco Ricci. Cross-representation mediation of user models. User Modeling and User-Adapted Interaction, 19(1-2):35-63, 2009. Impact factor 1.929

52. *** Shlomo Berkovsky, Tsvi Kuflik, and Francesco Ricci. Mediation of user models for enhanced personalization in recommender systems. User Modeling and User-Adapted Interaction, 18(3), 245-286, 2008. . Impact factor 1.929

53. *** Francesco Ricci and Quang Nhat Nguyen, Acquiring and Revising Preferences in a Critique-Based Mobile Recommender System, IEEE Intelligent Systems, 22 (3), 22-29, 2007. Impact factor 1.93

54. Nader Mirzadeh and Francesco Ricci, Cooperative Query Rewriting for Decision Making Support and Recommender Systems, Applied Artificial Intelligence, Volume 21, 1-38, 2007. Impact factor 0.475

55. Francesco Ricci and Hannes Werthner, Recommender Systems, International Journal of Electronic Commerce, 11(2), 5-9, 2006. Impact factor 1.555

56. Hector Munoz-Avila, Francesco Ricci and Robin Burke, The sixth international conference on case-based-reasoning (ICCBR05), AI Magazine, Volume 27, Number 1, pages 101-102, 2006. Impact factor 0.73

57. Hannes Werthner, Francesco Ricci: E-commerce and tourism. Communications of ACM 47(12): 101-105 (2004) Impact factor 2.51

Peer Reviewed Publications in Conference Proceedings

58. Marko Gasparic, Andrea Janes, Francesco Ricci: Development Tools Usage Inside Out. XP 2016: 291-295

59. Mouzhi Ge, Mehdi Elahi, Ignacio Fernández-Tobías, Francesco Ricci, David Massimo: Using Tags and Latent Factors in a Food Recommender System. Digital Health 2015: 105-112

60. Floriano Zini, Martin Reinstadler, Francesco Ricci: Life-logs Aggregation for Quality of Life Monitoring. Digital Health 2015: 131-132

61. Laura Blédaité, Francesco Ricci: Pairwise Preferences Elicitation and Exploitation for Conversational Collaborative Filtering. HT 2015: 231-236

62. Marko Gasparic, Francesco Ricci: Modeling Context-Aware Command Recommendation and Acceptance in an IDE. CSD@ICSE 2015: 1-5

63. Matthias Braunhofer, Francesco Ricci, Béatrice Lamche, Wolfgang Wörndl: A Context-Aware Model for Proactive Recommender Systems in the Tourism Domain. MobileHCI Adjunct 2015: 1070-1075

64. Matthias Braunhofer, Ignacio Fernández-Tobías, Francesco Ricci: Parsimonious and Adaptive Contextual Information Acquisition in Recommender Systems. IntRS@RecSys 2015: 2-8

65. Mehdi Elahi, Mouzhi Ge, Francesco Ricci, Ignacio Fernández-Tobías, Shlomo Berkovsky, David Massimo: Interaction Design in a Mobile Food Recommender System. IntRS@RecSys 2015: 49-52

66. Mouzhi Ge, Francesco Ricci, David Massimo: Health-aware Food Recommender System. RecSys 2015: 333-334

67. Panagiotis Bouros, Neal Lathia, Matthias Renz, Francesco Ricci, Dimitris Sacharidis: LocalRec'15: Workshop on Location-Aware Recommendations. RecSys 2015: 351-352

68. Matthias Braunhofer, Mehdi Elahi, Francesco Ricci. Usability Assessment of a Context-Aware and Personality-Based Mobile Recommender System. E-Commerce and Web Technologies - 15th International Conference, EC-Web 2014, Munich, Germany, September 1-4, 2014. Proceedings. Springer 2014 Lecture Notes in Business Information Processing ISBN: 978-3-319-10490-4: 77-88

69. Mehdi Elahi, Francesco Ricci, and Neil Rubens. Active Learning In Collaborative Filtering Recommender Systems. E-Commerce and Web Technologies - 15th International Conference, EC-Web 2014, Munich, Germany, September 1-4, 2014. Proceedings. Springer 2014 Lecture Notes in Business Information Processing ISBN: 978-3-319-10490-4: 113-124

70. Matthias Braunhofer, Mehdi Elahi, Mouzhi Ge, Francesco Ricci: Context Dependent Preference Acquisition with Personality-Based Active Learning in Mobile Recommender Systems. Learning and Collaboration Technologies. Technology-Rich Environments for Learning and Collaboration - First International Conference, LCT 2014, Held as Part of HCI International 2014, Heraklion, Crete, Greece, June 22-27, 2014, Proceedings, Part II. Springer 2014 Lecture Notes in Computer Science ISBN 978-3-319-07484-9

71. Matthias Braunhofer, Victor Codina, Francesco Ricci: Switching hybrid for cold-starting context-aware recommender systems. RecSys 2014: 349-352

72. Mehdi Elahi, Mouzhi Ge, Francesco Ricci, David Massimo, Shlomo Berkovsky: Interactive Food Recommendation for Groups. RecSys Posters 2014

73. Matthias Braunhofer, Mehdi Elahi, Francesco Ricci: STS: A Context-Aware Mobile Recommender System for Places of Interest. Posters, Demos, Late-breaking Results and Workshop Proceedings of the 22nd Conference on User Modeling, Adaptation, and Personalization co-located with the 22nd Conference on User Modeling, Adaptation, and Personalization (UMAP2014), Aalborg, Denmark, July 7-11, 2014. CEUR-WS.org 2014 CEUR Workshop Proceedings

74. Thai Son Nguyen, Francesco Ricci, Floriano Zini, Marcello Granconato: Life-Logging for Healthcare Proactive Advisory Systems. Posters, Demos, Late-breaking Results and Workshop Proceedings of the 22nd Conference on User Modeling, Adaptation, and Personalization co-located with the 22nd Conference on User Modeling, Adaptation, and Personalization (UMAP2014), Aalborg, Denmark, July 7-11, 2014. CEUR-WS.org 2014 CEUR Workshop Proceedings

75. Matthias Braunhofer, Mehdi Elahi, Francesco Ricci and Thomas Schievenin. Context-Aware Points of Interest Suggestion with Dynamic Weather Data Management. In Information and Communication Technologies in Tourism 2014, Proceedings of the International Conference. Dublin, Ireland, January 21-24, 2014:87-100, ISBN 978-3-319-03973-2

76. Mehdi Elahi, Matthias Braunhofer, Francesco Ricci, Marko Tkalcic: Personality-Based Active Learning for Collaborative Filtering Recommender Systems. AI*IA 2013: Advances in Artificial Intelligence - XIIIth International Conference of the Italian Association for Artificial Intelligence, Turin, Italy, December 4-6, 2013. Proceedings. Springer 2013 Lecture Notes in Computer Science ISBN 978-3-319-03523-9: 360-371

77. Dario Cavada, Manfred Mitterer, Francesco Ricci, Omar Moling, Floriano Zini: A multi-functional mobile information system for hospital assistance. Proceedings of the 26th IEEE International Symposium on Computer-Based Medical Systems, Porto, Portugal, June 20-22, 2013. IEEE 2013: 365-368

78. Francesco Ricci, Guoda Taraskeviciute, Floriano Zini: Lightweight navigation in the hospital with portable devices. Proceedings of the 26th IEEE International Symposium on Computer-Based Medical Systems, Porto, Portugal, June 20-22, 2013. IEEE 2013: 563-564

79. Manuel Enrich, Matthias Braunhofer, Francesco Ricci: Cold-Start Management with Cross-Domain Collaborative Filtering and Tags. E-Commerce and Web Technologies - 14th International Conference, EC-Web 2013, Prague, Czech Republic, August 27-28, 2013. Proceedings. Springer 2013 Lecture Notes in Business Information Processing ISBN 978-3-642-39877-3: 101-112

80. *** Marius Kaminskas, Francesco Ricci, Markus Schedl: Location-aware music recommendation using auto-tagging and hybrid matching. Seventh ACM Conference on Recommender Systems, RecSys '13, Hong Kong, China, October 12-16, 2013. ACM 2013 ISBN 978-1-4503-2409-0: 17-24

81. Henry Blanco, Francesco Ricci: Acquiring user profiles from implicit feedback in a conversational recommender system. Seventh ACM Conference on Recommender Systems, RecSys '13, Hong Kong, China, October 12-16, 2013. ACM 2013 ISBN 978-1-4503-2409-0: 307-310

82. Victor Codina, Francesco Ricci, Luigi Ceccaroni: Local context modeling with semantic pre-filtering. Seventh ACM Conference on Recommender Systems, RecSys '13, Hong Kong, China, October 12-16, 2013. ACM 2013 ISBN 978-1-4503-2409-0: 363-366

83. Henry Blanco, Francesco Ricci: Inferring user utility for query revision recommendation. Proceedings of the 28th Annual ACM Symposium on Applied Computing, SAC '13, Coimbra, Portugal, March 18-22, 2013. ACM 2013 ISBN 978-1-4503-1656-9: 245-252

Victor Codina, Francesco Ricci, Luigi Ceccaroni: Exploiting the Semantic Similarity of Contextual Situations for Pre-filtering Recommendation. User Modeling, Adaptation, and Personalization - 21th International Conference, UMAP 2013, Rome, Italy, June 10-14, 2013, Proceedings. Springer 2013 Lecture Notes in Computer Science ISBN 978-3-642-38843-9: 165-177

84. Auste Piliponyte, Francesco Ricci, Julian Koschwitz: Sequential Music Recommendations for Groups by Balancing User Satisfaction. Late-Breaking Results, Project Papers and Workshop Proceedings of the 21st Conference on User Modeling, Adaptation, and Personalization., Rome, Italy, June 10-14, 2013. CEUR-WS.org 2013 CEUR Workshop Proceedings

85. Marius Kaminskas, Ignacio Fernández-Tobías, Francesco Ricci and Ivan Cantador: Ontology-based Identification of Music for Places. In Proceedings of the International Conference in Innsbruck, Austria, January 22-25, 2013, Springer, ISBN 978-3-642-36309-2: 436-447 (second best paper award)

86. Mehdi Elahi, Francesco Ricci, Neil Rubens: Adapting to Natural Rating Acquisition with Combined Active Learning Strategies. Foundations of Intelligent Systems - 20th International Symposium, ISMIS 2012, Macau, China, December 4-7, 2012. Proceedings. Springer 2012 Lecture Notes in Computer Science ISBN 978-3-642-34623-1: 254-263

87. Marius Kaminskas, Ignacio Fernández-Tobías, Francesco Ricci, Iván Cantador: Knowledge-based music retrieval for places of interest. Proceedings of the second international ACM workshop on Music information retrieval with user-centered and multimodal strategies, MIRUM '12, Nara, Japan, October 29 - November 02, 2012. 2012 ISBN 978-1-4503-1591-3: 19-24

88. Omar Moling, Linas Baltrunas, Francesco Ricci: Optimal radio channel recommendations with explicit and implicit feedback. Sixth ACM Conference on Recommender Systems, RecSys '12, Dublin, Ireland, September 9-13, 2012: 75-82

89. Patrick Lamber, Manfred Mitterer, Laura Napolitano, Francesco Ricci,

Floriano Zini. Surveying patients with smart devices. Computer-Based Medical Systems (CBMS), 2012 25th International Symposium on. 2012, Page(s): 1 - 4

90. Francesco Ricci: Context-aware music recommender systems: workshop keynote abstract. WWW (Companion Volume) 2012: 865-866

91. Linas Baltrunas, Bernd Ludwig, Francesco Ricci. Rushed or Relaxed? – How the Situation on the Road Influences the Driver's Preferences for Music Tracks. Proceedings of the "Searching 4 Fun!" workshop, collocated with the annual European Conference on Information Retrieval (ECIR2012), Barcelona, Spain, April 1, 2012.

92. Henry Blanco and Francesco Ricci and Derek Bridge. Conversational Query Revision with a Finite User Profiles Model. IIR 2010 - Proceedings of the 3rd Italian Information Retrieval Workshop, Bari, Italy, January 26-27, 2012: 77-88.

93. Linas Baltrunas, Marius Kaminskas, Bernd Ludwig, Omar Moling, Francesco Ricci, Aykan Aydin, Karl-Heinz Lueke, and Roland Schwaiger. InCarMusic: Context-Aware Music Recommendations in a Car. 12th International Conference on Electronic Commerce and Web Technologies - EC-Web 2011. Toulouse, France. August 29 - September 2, 2011: 89-100.

94. Mehdi Elahi, Valdemaras Repsys, and Francesco Ricci. Rating Elicitation Strategies for Collaborative Filtering. 12th International Conference on Electronic Commerce and Web Technologies - EC-Web 201. Toulouse, France. August 29 - September 2, 2011: 160-171.

95. Mehdi Elahi, Francesco Ricci, Valdemaras Repsys. System-Wide Effectiveness of Active Learning in Collaborative Filtering. International Workshop on Social Web Mining. Co-located with IJCAI, 18 July 2011, Barcelona, Spain.

96. Linas Baltrunas, Bernd Ludwig, Stefan Peer, and Francesco Ricci. Context-Aware Places of Interest Recommendations and Explanations. 1st Workshop on Decision Making and Recommendation Acceptance Issues in Recommender Systems (DEMRA 2011). In conjunction with UMAP 2011. Girona, Spain, 11 July 2011.

97. Floriano Zini and Francesco Ricci. Guiding Patients in the Hospital. 2nd International Workshop on User Modeling and Adaptation for Daily Routines (UMADR). In conjunction with UMAP 2011. Girona, Spain, 11 July 2011.

98. Marius Kaminskas and Francesco Ricci. Location-Adapted Music Recommendation Using Tags. 19th International Conference on User Modeling, Adaptation and Personalization. Girona, Spain, 11-15 July, 2011: 183-194.

99. Linas Baltrunas, Bernd Ludwig, Stefan Peer, Francesco Ricci. Context-Aware Places of Interest Recommendations for Mobile Users. 14th International Conference on Human-Computer Interaction. Hilton Orlando Bonnet Creek, Orlando, Florida, USA, 9 -14 July 2011: 531-540.

100. Patrick Lamber, Bernd Ludwig, Francesco Ricci, Floriano Zini, and Manfred Mitterer. Message-Based Patient Guidance in Day-Hospital.

12th IEEE International Conference on Mobile Data Management. 6-9 June, 2011, Luleå, Sweden.

101.   Linas Baltrunas, Bernd Ludwig, Francesco Ricci. Context relevance assessment for recommender systems. Intelligent User Interfaces. Palo Alto, CA, 13-16 February 2011: 287-290.

102.   Walid Trabelsi, Nic Wilson, Derek Bridge, and Francesco Ricci. Comparing Approaches to Preference Dominance for Conversational Recommenders. In Proceedings of the 22th International Conference on Tools with Artificial Intelligence, Arras, France, October 27-29, 2010: 113-120. BEST PAPER AWARD

103.   Linas Baltrunas, Tadas Makcinskas, and Francesco Ricci. Group Recommendations with Rank Aggregation and Collaborative Filtering. In Proceedings of the Fourth ACM Conference on Recommender Systems (Barcelona, Spain, September 26 - 30, 2010). RecSys '10. ACM, New York, NY, 119-126.

104.   Linas Baltrunas, Marius Kaminskas, Francesco Ricci, Lior Rokach, Bracha Shapira, Karl/Heinz Luke. Best Usage Context Prediction for Music Tracks. In Proceedings of the 2nd Workshop on Context Aware Recommender Systems. September 26, 2010, Barcelona, Spain.

105.   Fabiana Lorenzi, Francesco Ricci, Mara Abel, and Ana L. C. Bazzan. Assumption-Based Reasoning for Multiagent Case-Based Recommender Systems. FLAIRS Conference 2010. AAAI Press.

106.   Alexander Felfernig, Monika Schubert and Monika Mandl, Francesco Ricci, Walid Maalej. Recommendation and Decision Technologies For Requirements Engineering. Second International Workshop on Recommendation Systems for Software Engineering, RSSE 2010, May 4, 2010. Co-located with ICSE 2010, Cape Town International Convention Centre (CTICC), Cape Town, South Africa.

107.   Linas Baltrunas, Francesco Ricci. Context-Dependent Recommendations with Items Splitting. IIR 2010, Italian Information Retrieval Workshop, Proceedings of the First Italian Information Retrieval Workshop, pages 71-75, Padua, Italy, January 27-28, 2010.

108.   Sabine Schneider, Francesco Ricci, Adriano Venturini, and Elena Not. Usability Guidelines for WAP-based Travel Planning Tools. In Information and Communication Technologies in Tourism 2010, pages 125-136, Springer, Wien Ney York.

109.   Linas Baltrunas and Francesco Ricci. Context-based splitting of item ratings in collaborative filtering. In Proceedings of the Third ACM Conference on Recommender Systems (New York, New York, USA, October 23 - 25, 2009). RecSys '09. ACM, New York, NY, 245-248.

110.   Linas Baltrunas and Francesco Ricci. Context-Dependent Items Generation in Collaborative Filtering. In Adomavicius, G., Ricci, F., editors, Proceedings of the 2009 Workshop on Context-Aware Recommender Systems, October 22-25, New York, USA.

111.   Marius Kaminskas and Francesco Ricci. Matching points of interest with music. In Orio, N., Rauber, A., and Rizo, D., editors, Workshop on Exploring Musical Information Spaces 2009, in conjunction with the 13th

European Conference on Digital Libraries (ECDL 2009), pages 68-73, October 1-2, 2009, Corfu, Greece.

112. Patrik Lamber, Andrea Girardello, Francesco Ricci, and Manfred Mitterer. Mobiday: a personalized context-aware mobile service for day hospital workflow support. In Grasso, F. and Paris, C., editors, Proceedings of the AIME09 International Workshop on: Personalization for e-Health, pages 15--19, July19, 2009. Verona, Italy.

113. Tariq Mahmood and Francesco Ricci. Improving recommender systems with adaptive conversational strategies. In Proceedings of the 20th ACM Conference on Hypertext and Hypermedia (Torino, Italy, June 29 - July 01, 2009). HT '09. ACM, New York, NY, 73-82.

114. Marius Kaminskas, and Francesco Ricci. Augmenting Points of Interest Recommendations with Music. SIAM SDM Workshop on Multimedia Data Mining, in conjunction with SIAM Data Mining Conference (SDM 2009), April 30 - May 2, 2009. John Ascuaga's Nugget-Sparks, Nevada.

115. Tariq Mahmood, Francesco Ricci, and Adriano Venturini. Learning Adaptive Recommendation Strategies for Online Travel Planning. In Information and Communication Technologies in Tourism 2009, Pages: 149-160, Springer, Wien Ney York. Best paper award

116. Gytis Tumas, and Francesco Ricci. Personalized Mobile City Transport Advisory System. In Information and Communication Technologies in Tourism 2009, Pages: 173-184, Springer, Wien Ney York.

117. Olga Averjanova, Francesco Ricci, and Quang Nhat Nguyen. Map-based Interaction with a Conversational Mobile Recommender System, The Second International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies, UBICOMM 2008, September 29 - October 4, Valencia, Spain. Page(s):212 - 218

118. Quang Nhat Nguyen and Francesco Ricci. Conversational Case-Based Recommendations Exploiting a Structured Case Model. In Advances in Case-Based Reasoning, 9th European Conference, ECCBR 2008, Trier, Germany, September 1-4, 2008. Pages 400-414.

119. Tariq Mahmood and Francesco Ricci. Adapting the interaction state model in conversational recommender systems. In Proceedings of the 10th international Conference on Electronic Commerce (Innsbruck, Austria, August 19 - 22, 2008). ICEC '08, vol. 342. ACM, New York, NY, 1-10.

120. Linas Baltrunas and Francesco Ricci. Locally Adaptive Neighborhood Selection for Collaborative Filtering Recommendations, in Proceedings of Adaptive Hypermedia and Adaptive Web-Based Systems (AH 2008), pages 22-31.

121. Fabiana Lorenzi, F. A.C. Correa, Ana L.C. Bazzan, Mara Abel and Francesco Ricci. A multiagent recommender system with task agent specialization. The Tenth International Workshop on Agent Mediated Electronic Commerce (AMEC 2008) - in conjunction with AAMAS-2008 (the Seventh International Joint Conference on Autonomous Agents and Multiagent Systems, May 13, 2008. Estoril, Portugal.

122. Tariq Mahmood, Francesco Ricci, Adriano Venturini, and Wolfgang Höpken. Adaptive Recommender Systems for Travel Planning. In Information and Communication Technologies in Tourism 2008, proceedings of ENTER 2008 International Conference, Innsbruck, Springer Verlag.

123. Quang Nhat Nguyen and Francesco Ricci. Long-Term and Session-Specific User Preferences in a Mobile Recommender System, ACM International Conference on Intelligent User Interfaces 2008 - IUI2008, Maspalomas, Gran Canaria, Spain, January 13-16, 2008.

124. Quang Nhat Nguyen and Francesco Ricci. Replaying live-user interactions in the off-line evaluation of critique-based mobile recommendations. In ACM Recommender Systems 2007, October 19-20, 2007, Minneapolis, Minnesota, USA, Pages 81-88, 2007. ACM.

125. Derek Bridge and Francesco Ricci. Supporting product selection with query editing recommendations. In ACM Recommender Systems 2007, October 19-20, 2007, Minneapolis, Minnesota, USA, Pages 65-72, 2007. ACM.

126. Shlomo Berkovsky, Yaniv Eytani, Tsvika Kuflik, and Francesco Ricci. Enhancing privacy and preserving accuracy of a distributed collaborative filtering. In ACM Recommender Systems 2007, October 19-20, 2007, Minneapolis, Minnesota, USA, Page 9-16, 2007. ACM.

127. Shlomo Berkovsky, Tsvika Kuflik, and Francesco Ricci. Distributed collaborative filtering with domain specialization. In ACM Recommender Systems 2007, October 19-20, 2007, Minneapolis, Minnesota, USA, Pages 33-40, 2007. ACM.

128. Tariq Mahmood and Francesco Ricci. Towards Learning User-Adaptive State Models in a Conversational Recommender System. In Proceedings of 15th Workshop on Adaptivity and User Modeling in Interactive Systems, Halle, Germany, 24.-26.9.2007. ISBN 978-3-86010-907-6

129. Francesco Ricci and Tariq Mahmood. Learning and adaptivity in interactive recommender systems. In Proceedings of the Ninth International Conference on Electronic Commerce (ICEC 07), University of Minnesota, Minneapolis, MN, US, August 19-22, Pages 75-84, 2007.

130. Shlomo Berkovsky, Tsvi Kuflik, Francesco Ricci. Cross-Domain Mediation in Collaborative Filtering, UM 2007, 11th International Conference on User Modeling, Corfu, Greece, 25-29 June, 2007.

131. Shlomo Berkovsky, Lora Aroyo, Dominik Heckmann, Geert-Jan Houben, Alexander Kröner, Tsvi Kuflik, Francesco Ricci. Providing Context-Aware Personalization through Cross-Context Reasoning of User Modeling Data, UbiDeUM'2007 - International Workshop on Ubiquitous and Decentralized User Modeling, at UM 2007, 11th International Conference on User Modeling, Corfu, Greece, 25-29 June, 2007.

132. Shlomo Berkovsky, Nikita Borisov, Yaniv Eytani, Tsvi Kuflik, Francesco Ricci. Examining Users' Attitude towards Privacy Preserving Collaborative Filtering, Workshop on Data Mining for User Modeling, UM 2007, 11th International Conference on User Modeling, Corfu, Greece, 25-29 June,

2007.

133.   Hannes Werthner, Hans Robert Hansen, and Francesco Ricci. Recommender systems. In 40th Hawaii International Conference on Systems Science (HICSS-40 2007), page 167, 3-6 January 2007, Waikoloa, Big Island, HI, USA, 2007. IEEE Computer Society.

134.   Shlomo Berkovsky, Lora Aroyo, Dominik Heckmann, Geert-Jan Houben, Alexander Kröner, Tsvi Kuflik, Francesco Ricci. Predicting User Experiences through Cross-Context Reasoning, Proceedings of 4th Workshop on Adaptivity and User Modeling in Interactive Systems, ABIS 06, Hildesheim, Germany, 9-11 October 2006.

135.   Pavel Bekkerman, Sarit Kraus and Francesco Ricci. Applying cooperative negotiation methodology to group recommendation problem, ECAI Workshop on Recommender systems, Riva del Garda, August 28-29. 2006.

136.   Francesco Ricci and Tariq Mahmood. Learning and Adaptivity in Interactive Recommender Systems, ECAI Workshop on Recommender systems, Riva del Garda, August 28-29. 2006.

137.   Adriano Venturini and Francesco Ricci. Applying Trip@dvice Recommendation Technology to www.visiteurope.com, European Conference on Artificial Intelligence, 4th Prestigious Applications of Intelligent Systems (PAIS-2006), The 17th European Conference on Artificial Intelligence, Riva del Garda, Italy / Aug 28th - Sept 1st, Pages 607-611, 2006.

138.   Shlomo Berkovsky , Dan Goldwasser, Tsvi Kuflik and Francesco Ricci. Identifying Inter-Domain Similarities through Content-Based Analysis of Hierarchical Web-Directories, The 17th European Conference on Artificial Intelligence, Riva del Garda, Italy / Aug 28th - Sept 1st, 2006.

139.   Shlomo Berkovsky, Tsvi Kuflik, Francesco Ricci. Enhancing Privacy while Preserving Accuracy of the Collaborative Filtering, ECAI Workshop on Recommender Systems, Riva del Garda, August 28-29. 2006. Pages 49-53.

140.   Shlomo Berkovsky, Tsvi Kuflik, Francesco Ricci. Cross-Technique Mediation of User Models, in proceedings of the International Conference on Adaptive Hypermedia and Adaptive Web-Based Systems, Dublin, Ireland, June 21-23, Pages 21-30, 2006. Best Paper Award

141.   Shlomo Berkovsky, Yaniv Eytani, Tsvi Kuflik, and Francesco Ricci. Hierarchical neighborhood topology for privacy enhanced collaborative filtering. In CHI 2006 Workshop on Privacy-Enhanced Personalization, Montreal, April 22 2006.

142.   Francesco Ricci and René T. A. Wietsma. Product Reviews in Travel Decision Making, Information and Communication Technologies in Tourism 2006, Pages 296-307, Proceedings of the International Conference in Lausanne, Switzerland, 2006. Springer Verlag.

143.   Shlomo Berkovsky, Tsvi Kuflik and Francesco Ricci. Entertainment Personalization Mechanism Through Cross-Domain User Modeling, in Intelligent Technologies for Interactive Entertainment: First International Conference, INTETAIN 2005, pp. 215 – 219, Madonna di Campiglio, Italy,

November 30 – December 2, 2005. Springer-Verlag.

144.   Shlomo Berkovsky, Tsvi Kuflik, Francesco Ricci. P2P Case Retrieval with an Unspecified Ontology, in proceedings of the International Conference on Case-Based Reasoning (ICCBR), Page 91-105, Chicago, IL, August 2005. Springer Verlag.

145.   Shlomo Berkovsky, Paolo Busetta, Yaniv Eytani, Tsvi Kuflik, Francesco Ricci. Collaborative Filtering over Distributed Environment, in proceedings of the Workshop on Decentralized, Agent-Based and Social Approaches to User Modeling, in conjunction with the International Conference on User Modeling (UM), Pages 1-10, Edinburgh, UK, July 2005.

146.   Shlomo Berkovsky, Yaniv Eytani, Tsvi Kuflik, Francesco Ricci. Privacy-Enhanced Collaborative Filtering, in proceedings of the Workshop on Privacy-Enhanced Personalization, in conjunction with the International Conference on User Modeling (UM), Pages 75-83, Edinburgh, UK, July 24-29, 2005.

147.   Renè T.A. Wietsma, Francesco Ricci. Product Reviews in Mobile Decision Aid Systems. Workshop on Pervasive Mobile Interaction Devices (PERMID 2005), in conjunction with Pervasive 2005. May 11th 2005, Munich, Germany. http://www.medien.ifi.lmu.de/permid2005/

148.   Nader Mirzadeh, Francesco Ricci, and Mukesh Bansal. Feature Selection Methods for Conversational Recommender Systems, in Proceedings of IEEE International Conference on e-Technology, e-Commerce and e-Services, Pages 772-777, Hong Kong, 29 March – 1 April, 2005. IEEE Press.

149.   Ulrich Rabanser and Francesco Ricci. Recommender systems: Do they have a viable business model in e-tourism?, Information and Communication Technologies in Tourism 2005, Proceedings of the International Conference, Innsbruck, Austria, January 26-28 2005. Pages 160-171. Springer Wien New York.

150.   Francesco Ricci, Karl Wöber, and Andreas Zins. Recommendations by Collaborative Browsing, Information and Communication Technologies in Tourism 2005, Proceedings of the International Conference, Innsbruck, Austria, January 26-28 2005. Pages 172-182. Springer Wien New York.

151.   Quang Nhat Nguyen, Francesco Ricci, Dario Cavada. User Preferences Initialization and Integration in CritiqueBased Mobile Recommender Systems, in Artificial Intelligence in Mobile Systems 2004, Pages 71-78, In conjunction with UbiComp 2004, Tuesday, September 7, Nottingham, UK.

152.   Quang Nhat Nguyen, Francesco Ricci, Dario Cavada. Critique-based Recommendations for Mobile Users: GUI Design and Evaluation, in 3rd Workshop on "HCI in Mobile Guides", in conjunction with 6th International Conference on Human Computer Interaction with Mobile Devices and Services (MobileHCI 04), University of Strathclyde, Glasgow, Scotland, 13 to 16 September 2004.

153.   Nader Mirzadeh, Francesco Ricci and Mukesh Bansal. Supporting User Query Relaxation in a Recommender System, in Proceedings of the

5th International Conference on Electronic Commerce and Web Technologies [EC-Web '04], Zaragoza, Spain, 30 August - 3 September, 2004.

154. Fabiana Lorenzi, Mara Abel, Francesco Ricci. SISAIH: a Case-Based Reasoning Tool for Hospital Admission Authorization Management, in Proceedings of Workshop on CBR in the Health Sciences, at The Seventh European Conference on Case-Based Reasoning [ECCBR-04] Madrid, Spain, August 31, 2004.

155. Quang Nhat Nguyen, Dario Cavada, Francesco Ricci. On-Tour Interactive Travel Recommendations, in Proceedings of the 11th International Conference on Information and Communication Technologies in Travel & Tourism [ENTER 2004], Cairo, Egypt, January 26 - 28, 2004. Pages 259-270.

156. Andreas Zins, Ulrike Bauernfeind, Fabio Del Missier, Nicole Mitsche, Francesco Ricci, Hildegard Rumetshofer, Erwin Schaumlechner. Prototype testing for a destination recommender system: steps, procedures and implications, in Proceedings of the 11th International Conference on Information and Communication Technologies in Travel & Tourism [ENTER 2004], Cairo, Egypt, January 26 - 28, 2004.

Experience in academic teaching with a precise indication of the dates	**Title of courses given last 5 year, name of University/Institute, subject area, academic level (under-/post-graduate / PhD)**
	• Research Methods for Recommender Systems and Information Retrieval (University of Varazdin, Croatia) – PhD (April 2014, 20 hours).
	• Recommender Systems (Technical University of Vienna) – PHD (June 2013, 20 hours).
	• Information Search and Retrieval (Free University of Bozen-Bolzano) – post-graduate (from 2009/2010 to now, 8 credits 72 hours).
	• Introduction to Programming (Free University of Bozen-Bolzano) – under-graduate (from 2011/2012 to now, 8 credits 48 hours).
	• Internet Technologies (from 2008/2009 to 2010/2011, 8 credits 48 hours).
	• Advanced Topics in Information Systems (Free University of Bozen-Bolzano) – post-graduate (2008/2009, 4 credits 36 hours).
	• Mobile Services (Free University of Bozen-Bolzano) – under- and post-graduate (from 2008/2009 to 2010/2011, 4 credits 36 hours).
	• Information Search on Internet (Technical University of Vienna) – post-graduate (2008/2009, 15 hours).

Summary of significant personal achievements in teaching

I have received the best teacher award of 2012 from the Faculty of Computer Science of the Free University of Bozen-Bolzano.

I have been the first at FUB to develop and teach a course on Mobile Services (in 2007). The course received a very positive evaluation from the students (see students evaluation).

I have developed course material on Recommender Systems (starting from 2006). I and other professors from many universities have used this material in a number of courses on information search and recommender systems.

Seminars/tutorials/workshops and supervision of thesis (BSc.; MSc.) in the last three years

Bachelor Students Supervision

- Massimo David (University of Bozen-Bolzano) Food Recommender System (BSc thesis, October 2014).

- Stefan Moser (University of Bozen-Bolzano) Timeline visualization of learning activities in the Nymphaea System (BSc thesis, October 2013).

- Patric Amatulli (University of Bozen-Bolzano) Suggesting sustainable transportation options for citizens: the Case Study of South Tyrol (BSc thesis, July 2013).

- Giuseppe Aina (University of Bozen-Bolzano) Emotion-based Internet Radio Recommender System (BSc thesis, March 2013).

- Miriam Fostini (University of Bozen-Bolzano) Mixare: an augmented reality app for android phones (BSc thesis, March 2012).

- Johannes Erschbamer (University of Bozen-Bolzano) Integrating Google Web Toolkit Components into a Content Management System (BSc thesis, October 2011).

- Manfred Malleier (University of Bozen-Bolzano) Service Monitoring with a Platform Independent Mobile Application (BSc thesis, July 2011).

Master Students Supervision

- David Massimo (University of Bozen-Bolzano), Tag Based Food Recommendations (MSc thesis, October 2016).

- Nguyen ThaiSon (University of Bozen-Bolzano) Mobile Lifelogging for Allergic Rhinitis Management (MSc thesis, July 2014).

- Lukas Siemon (University of Bozen-Bolzano) Group recommendation techniques for individual recommendations (MSc thesis, October 2013).

- Laura Bledaite, (University of Bozen-Bolzano) Ranking with pairwise preferences (MSc thesis, March 2014).

- Manuel Enrich, (University of Bozen-Bolzano) Cross domain recommendations with tags (MSc thesis, October 2012).

- Auste Piliponyte, (University of Bozen-Bolzano) Sequential group recomendations (MSc thesis, October 2012).

- Omar Moling, (University of Bozen-Bolzano) Context-aware zero feedbacks music personalization (MSc thesis, October 2011).

- Matthias Braunhofer, (University of Bozen-Bolzano) Mobile Music Recommendations (MSc thesis, March 2011).

- Francesca Guzzi, (University of Bozen-Bolzano) Group Recommendations

by Negotiation (MSc thesis, March 2011).

Postgraduate supervision (PhD level): number of students supervised in the last five years with subject areas

- Tural Gurbanov (University of Bozen-Bolzano) User Action Prediction in Recommender Systems (2015-now)

- Thuy Ngoc Nguyen (University of Bozen-Bolzano) Supporting Group Discussions with Recommendation Techniques (2015-now)

- Saikishore Kalloori (University of Bozen-Bolzano) Pairwise preferences in recommender systems (2014-now)

- Marko Gasparic (University of Bozen-Bolzano) Command recommendations in IDE (2015-now)

- Matthias Braunhofer (University of Bozen-Bolzano) Cold-Start in Context-Aware Recommender Systems (Completer on April 2016)

- Mehdi Elahi, (University of Bozen-Bolzano) Active Learning in Recommender Systems (Completed on April 2014).

- Marius Kaminskas, (University of Bozen-Bolzano) Adapting music to locations (Completed on April 2013).

- Linas Baltrunas, (University of Bozen-Bolzano) Phd in Context-Aware Collaborative Filtering Recommender Systems (Completed on April 2011).

- Tariq Mahmood, (University of Trento), Phd in Learning Adapted Interaction Strategies in Conversational Recommender Systems (Completed on March 2009).

Innovative teaching methods and production of teaching material etc.

Developed a course on Mobile Services and a course on Recommender Systems, whose material have been used in several other universities around the word.

Teaching in LLL-programs

I have taught every year 3/4 times lectures on information search and recommender systems in the high schools of South Tyrol in the context of our promotional activity in the schools.

Other academic responsibilities

Internal appointments to faculty and university boards

- Vice Dean of the Studies (2014-2015)

- Member of the Central Study Commission (2014-2015)

- Director of the Master Course Program in Computer Science (since 2012-2015)

- Member of the selection committee of the master program (2011-2014)

- President of the "gruppo di riesame" of the master program (2012-2014)

Membershi ps	• President of the quality commission of the master program (2013)
	• Member of the teaching commission of the master program (2011-2012)
	• Representative of the Faculty of Computer Science in the central research commission (2006-2009)

External appointments at national and international level

President of the Steering Committee of the ACM Conference on Recommender Systems (2007-2010)

Editor in Chief of the International Journal of Information Technology and Tourism (Springer) (2012-now)

Member of the PhD final exam commission for the following candidates:

- Yong Zhang, June 6th 2016, De Paul University, Chicago, USA.

- Nafiseh Shabib, June 5th, 2016, NTNU, Norvegian University of Science and Technology, Trondheim, Norway.

- Victor Codina, June 13, 2014, Universitat Politècnica de Catalunya, Barcelona, Spain.

- Ante Odic, July 2013, University of Lubiana, Slovenia.

- Raffaele Cannone, Vito Nicola Convertini, Danilo Dell'Agnello, Cataldo Musto, Fedelucio Narducci, Alessandro Pagano, June 2012, Universita' di Bari.

- Felice Ferrara, (external reviewer), January 2011, University of Udine.

Reviewers for the Research Foundation Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO) – Post Doc Fellowship (2014).

Consultant/Reviewer for Springer Publisher for the SpringerBriefs Books series.

Responsibilities for organizing conferences/seminars/exhibitions (place, duration, institute)

- UMAP 2015, 23rd International Conference on User Modeling, Adaptation, and Personalization (UMAP 2015), Dublin, June 29 - July 3 2015. (PC co-chair)

- Doctoral Consortium, The 22nd conference on User Modeling, Adaptation, and Personalization — UMAP 2014, Aalborg, Denmark, July 7, 2014. (PC co-chair)

- 29th Symposium On Applied Computing, (Track on Recommender Systems: Theory and Applications), Gyeongju, Korea, March 24 - 28, 2014. (PC co-chair)

- RecSys'13 Workshop on Human Decision Making in Recommender Systems (Decision@RecSys13), In conjunction with the 7th ACM Conference on Recommender Systems, October 7, 2013, Hong Kong.

(PC co-chair and organizer)

- RecSys'12 Workshop on Human Decision Making in Recommender Systems (Decision@RecSys12), In conjunction with the 6th ACM Conference on Recommender Systems, September 9-13, 2012, Dublin, Ireland. (PC co-chair and organizer)

- Recommendation Technologies for Lifestyle Change 2012 (Lifstyle2012), workshop collocated with the 6th ACM Conference on Recommender Systems, Dublin, Ireland - 13th September 2012. (PC co-chair and organizer)

- ENTER 2012 International Conference on Information and Communication Technologies in Tourism - ENTER 2012, Helsingborg Sweden 24th to 27th January 2012. (PC co-chair)

- Third Workshop on Context-Aware Recommender Systems (CARS-2011), Chicago, IL, USA - October 23, 2011. In conjunction with the 5th ACM Conference on Recommender Systems. (PC co-chair and organizer)

- 1st Workshop on Decision Making and Recommendation Acceptance Issues in Recommender Systems (DEMRA 2011). In conjuction with UMAP 2011. Girona, Spain - July 11, 2011. (PC co-chair and organizer)

- ENTER 2011 International Conference on Information and Communication Technologies in Tourism - ENTER 2011, Innsbruck, Austria, 26-28 January, 2011. (PC co-chair)

- Workshop on Context-Aware Recommender Systems (CARS-2009), New York, NY, USA - October 25, 2009
In conjunction with the 3rd ACM Conference on Recommender Systems. (PC co-chair and organizer)

Cooperation in commissions/boards/international programs/LLL-programs or active support to the university in one's own competence fields; participation in organizational and/or institutional activities for the university requiring extraordinary efforts and availability

- Organization of the OpenDay: I have organized the last two editions of the OpenDay.

- Long Night of the research: two years ago I have presented and again this year I will present results of the research group on recommender system at the "Long Night of The Research".

- Preparation of the Faculty Report: in the contest of the organization of the 10 years of Computer Science (which I have contributed to organize) I have coordinated the preparation of the faculty report: a professionally printed description of the teaching offer and the research achievements of the faculty of computer science (2012). This required the coordination of a technical editor and a graphic designer.

- Lectures in the High Schools: I have taught every year several lectures on information retrieval and recommender systems in the high schools of South Tyrol.

Membership of academic or professional bodies (including membership of Editorial Boards of scientific publications;

membership of scientific committees for international conferences or programs)

- Member of the Steering Committee of the ACM Conference on Recommender Systems (2007-now)

- Member of the ACM since 2006.

- Member of AI*IA (Italian Association for Artificial Intelligence) since 2013.

- Member of the editorial board of the Journal: User Modeling and User Adapted Interaction (2012-now)

- ACM Transaction on Interactive Intelligent Systems - Special Issue on Human Decision Making and Recommender Systems - Associate editor (2011)

- International Journal of Human-Computer Studies - Special issue on Special issue on Measuring the Impact of Personalization and Recommendation on User Behaviour - Associate editor (2008-2010)

Member of the Programme Committee of the following conferences:

- 16th International Conference on Electronic Commerce and Web Technologies - EC-Web 2015, Valencia, Spain, September 1- 2, 2015.

- 9th ACM Conference on Recommender Ssystems (RECSYS 2015). Vienna, September 16-20, 2015.

- Demo Session at the 9th ACM Conference on Recommender Ssystems (RECSYS 2015). Vienna, September 16-20, 2015.

- SoMeRA 2015, 2nd International Workshop on Social Media Retrieval and Analysis,in conjunction with the IEEE International Conference on Data Mining (ICDM 2015). Nov 14, 2015. Atlantic City, New Jersey, USA.

- Intelligent Personalization (IP 2015) workshop at IJCAI 2015, 25-27 July 2015, Buenos Aires, Argentina.

- 8th ACM Conference on Recommender Systems (RECSYS 2014). October 6-10, 2014. Foster City, Silicon Valley, USA.

- IntRS 2014 (Joint Workshop on Interfaces and Human Decision Making for Recommender Systems. In conjunction with 8th ACM Conference on Recommender Systems (RECSYS 2014). October 6-10, 2014. Foster City, Silicon Valley, USA.

- 15th International Conference on Electronic Commerce and Web Technologies - EC-Web 2014, Munich, September 1- 5, 2014.

- IIiX 2014 (The 5th Information Interaction in Context Conference), Regensburg, 26-30, August, 2014.

- PAIS 2014, Conference on Prestigious Applications of Intelligent Systems – PAIS 2014, 20–21 August 2014, Prague, Czech Republic.

- The 22nd conference on User Modeling, Adaptation, and Personalization — UMAP 2014, Aalborg, Denmark, July 7-11, 2014.

- The 2nd workshop on Emotions and Personality in Personalized Services (EMPIRE 2014), in conjunction with the UMAP 2014 conference and will be held in Aalborg, Denmark, as a full-day workshop on 11. July 2014.

- Workshop on Context-awareness in Retrieval and Recommendation (CaRR

2014), in conjunction with the ECIR 2014 Conference, Amsterdam, The Netherlands, April 13, 2014.

- AVI 2014 International Working Conference on Advanced Visual Interfaces, Como (Italy) May 27-30, 2014.

- ESWC2014-Challenges (Challenge Track of the Extended Semantic Web Conference (ESWC 2014), Hersonissou, Crete, Greece, May-25-29, 2014.

- ENTER 2014 International Conference on Information and Communication Technologies in Tourism - Enter 2014, Dublin, Ireland, 21-24 January, 2014.

- 5th Italian Information Retrieval Workshop (IIR 2014), January 20-21 2014 University of Roma "Tor Vergata", Italy.

- 7th ACM Conference on Recommender Systems (RECSYS 2013). October 12-16, 2013. Hong Kong.

- Workshop on Context-awareness in Retrieval and Recommendation (CaRR 2013), in conjunction with the Sixth ACM WSDM Conference, Rome, Italy, February 6-8, 2013.

- 14th International Conference on Electronic Commerce and Web Technologies - EC-Web 2013, Prague, August 26-30, 2013.

- IEEE International Conference on Business Informatics (CBI 2013), Vienna, July 15-18, 2013.

- The AAAI 2013 Workshop on Intelligent Techniques For Web Personalization and Recommender Systems (ITWP 2013), 15 July 2013, Bellevue, Washington.

- The 21st conference on User Modeling, Adaptation, and Personalization — UMAP 2013, Rome, July 10-14, 2013. And, Doctoral Consortium.

- ENTER 2013 International Conference on Information and Communication Technologies in Tourism - Enter 2013, Innsbruck, Austria, 22-25 January, 2013.

- ACM Symposium on Applied Computing (SAC), Track on Recommender Systems: Theory and Applications (RS), March 18-22, 2013, Coimbra, Portugal.

- 6th ACM Conference on Recommender Systems (RECSYS 2012). September 9-13, 2012. Dublin, Ireland.

- 13th International Conference on Electronic Commerce and Web Technologies - EC-Web 2012 Vienna (Austria), September 3 - 7, 2012.

- 10th Workshop on Intelligent Techniques for Web Personalization & Recommender Systems (ITWP 2012). In conjunction with AAAI July 22, 2012 - Toronto, Canada.

- ISMIS 2012 - The 20th International Symposium on Methodologies for Intelligent Systems, Special Session on Human Factors in Information Retrieval, Macau, 4-7 December 2012.

- The 20th conference on User Modeling, Adaptation, and Personalization — UMAP 2012, Montreal, July 16-20, 2012. And, Doctoral Consortium.

- 1st International Workshop on Personalized Knowledge Modeling with Big Data, co-located with the 20th Conference on User Modeling, Adaptation, and Personalization (UMAP 2012) in Montreal, Canada, July 16-20, 2012.

- 2nd Workshop on Context-awareness in Retrieval and Recommendation (CaRR 2012), in conjunction with IUI 2012, Lisbon, Portugal, February

14th, 2012.

- 3rd Italian Information Retrieval Workshop (IIR 2012). January 26-27 2012, Dipartimento di Informatica (DIB), Università di Bari "Aldo Moro", Bari, Italy.

- 5th ACM CONFERENCE ON RECOMMENDER SYSTEMS (RECSYS 2011). October 23-27, 2011. The Palmer House Hilton. Chicago, IL, USA.

- International ACM RecSys Workshop on Novelty and Diversity in Recommender Systems - DiveRS 2011. Chicago, IL, USA, 23 or 27 October 2011.

- 2nd Workshop on Information Heterogeneity and Fusion in Recommender Systems (HetRec 2011). In conjunction with the 5th ACM Conference on Recommender Systems. October 23-27, 2011, Chicago, IL, USA.

- RecSys'11 Workshop on Human Decision Making in Recommender Systems. In conjunction with the 5th ACM Conference on Recommender Systems. October 23-27, 2011, Chicago, IL, USA.

- Context Aware Intelligent Assistance (CAIA 2011), located at KI-2011,Technical University, Berlin, October 04, 2011.

- EC-Web 2011, "Recommender Systems" track, August 29-September 2, 2011, Toulouse, France.

- 9th Workshop on Intelligent Techniques for Web Personalization & Recommender Systems (ITWP 2011). In conjunction with IJCAI 2011. July 16, 2011 - Barcelona, Spain.

- User Modeling, Adaptation, and Personalization (UMAP 2011), July 11-15, 2011, Girona, Spain.

- 1st International Workshop on Adaptation, Personalization and Recommendation in the Social-semantic Web (APRESW 2010), 30 or 31 May 2010 | Heraklion, Greece.

- 1st Workshop on Context-Awareness in Retrieval and Recommendation (CARR2011), in conjunction with 2011 International Conference on Intelligent User Interfaces, February 13-16, 2011.

- **Susanne Bødker**
  Professor
- Institut for Datalogi
- Institut for Kommunikation og Kultur - Participatory Information Technology
  Postaddresse:
  Åbogade 34
  5346, 122
  8200
  Aarhus N
  Danmark
  Postaddresse:
  Helsingforsgade 14
  8200
  Aarhus N
  Danmark
  E-mail: bodker@cs.au.dk
  Telefon: +4587156148

Uddannelse

Cand. scient. Datalogi og matematik Aarhus Universitet, 1982. Lic.scient. Datalogi Aarhus Universitet 1987. Dr. scient. Aarhus Universitet, 1999.

Ansættelse

1982-83 Visiting scientist at Xerox Palo Alto Research Laboratory, California USA
1983 Visiting researcher, University of Electro-Communications, Tokyo Japan
1983 - 1990 Ph.D. student and assistant professor, University of Aarhus.
1990 - 2001 Associate Professor, Computer Science Department, University of Aarhus.
1996 Visiting researcher, Department of Computer Science and Informa¬tion Systems, University of Limerick, Ireland (3 months)
2001 Professor, Computer Science Department, University of Aarhus.
2009 Visiting professor, KTH Stockholm (3 months)

Forskningsinteresser

Human-computer interaction. Participatory design. Computer Supported Cooperative Work (CSCW). Computer-mediated activity

Publikationer

Tying Knots: Participatory Infrastructuring at Work
Bødker, S., Dindler, C. & Iversen, O. S. 29 jan. 2017 I : Computer Supported Cooperative Work.
Rethinking technology on the boundaries of life and work
Bødker, S. aug. 2016 I : Personal and Ubiquitous Computing. 20, 4, s. 533 - 544 12 s.
Advances in Participatory Design
Bødker, S., Dindler, C., Halskov, K. & Iversen, O. S. 1 maj 2016 *CHI EA '16: Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems* . Association for Computing Machinery, s. 984-987 4 s.
'A Farmer, a Place and at least 20 Members': The Development of Artifact Ecologies in Volunteer-based Communities.
Bødker, S., Korsgaard, H. & Saad-Sulonen, J. 2016 *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. California, USA: Association for Computing Machinery, s. 1142-1156 15 s.
Computational Alternatives in Participatory Design: Putting the T Back in Socio-technical Research
Korsgaard, H., Klokmose, C. N. & Bødker, S. 2016 *Proceedings of the 14th Participatory Design Conference*. New York, NY, USA: Association for Computing Machinery, Vol. 1, s. 71-79 9 s. (PDC '16).
Dynamics, Multiplicity and Conceptual Blends in HCI
Bødker, S. & Klokmose, C. N. 2016 *CHI '16 : Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, s. 2538-2548 11 s.
Happenstance, Strategies and Tactics: Intrinsic Design in a Volunteer-based Community
Bødker, S., Korsgaard, H., Lyle, P. & Saad-Sulonen, J. 2016 *Proceedings of the 9th Nordic Conference on Human-Computer Interaction*. Barendregt, W. & Obaid, M. (red.). New York, NY, USA: Association for Computing Machinery, s. 10:1-10:10 10 s. (NordiCHI '16).
Nine questions for HCI researchers in the making
Bødker, S., Hornbæk, K., Oulasvirta, A. & Reeves, S. 2016 I : Interactions (New York). 23, 4, s. 58-61 4 s.

Critical Alternatives: Proceedings of The Fifth Decennial Aarhus Conference 17- 21 August 2015, Aarhus, Denmark
Bardzell, S. (red.), Bødker, S. (red.), Iversen, O. S. (red.), Klokmose, C. N. (red.) & Korsgaard, H. (red.) 17 aug. 2015 Aarhus: Department of Computer Science, Aarhus University. 180 s.

Foreword
Bertelsen, O. W., Halskov, K., Bardzell, S. (red.), Bødker, S. (red.), Iversen, O. S. (red.), Klokmose, C. N. (red.) & Korsgaard, H. (red.) 17 aug. 2015 *Critical Alternatives: Proceedings of The Fifth Decennial Aarhus Conference 17- 21 August 2015, Aarhus, Denmark*. Aarhus: Department of Computer Science, Aarhus University, s. ii 1 s.

A dialectical take on artifact ecologies and the physical - digital divide
Bødker, S. & Klokmose, C. N. 2015

Ecological Perspectives in HCI: Promise, Problems, and Potential
Blevis, E., Bødker, S., Flach, J., Forlizzi, J., Jung , . H. E., Kaptelinin, V., Nardi, . B. O. & Rizzo, A. 2015

Mediation and Meaning in HCI
Bødker, S., Bertelsen, O. W., Bannon, L. J., De Souza, C., Barbosa, S. & Prates, R. 2015 *Human-Computer Interaction – INTERACT 2015: 15th IFIP TC 13 International Conference, Bamberg, Germany, September 14-18, 2015, Proceedings, Part IV*. Springer, s. 667-668 2 s. (Lecture Notes in Computer Science, Vol. 9299).

Participation in design between public sector and local communities
Bødker, S. & Zander, P-O. 2015 *Proceedings of the 7th International Conference on Communities and Technologies, C&T '15*. Begole, B. & Kim, J. (red.). Association for Computing Machinery, 10 s.

SketchCode – an extensible code editor for crafting software
Baader, S. & Bødker, S. 2015 *End-User Development: 5th International Symposium, IS-EUD 2015, Madrid, Spain, May 26-29, 2015. Proceedings*. Springer, Vol. 9083, s. 211-216 6 s. (Lecture Notes in Computer Science, Vol. 9083).

Third-wave HCI, 10 years later - participation and sharing
Bødker, S. 2015 I : Interactions (New York). 22, 5, s. 24-31 8 s.

Transdisciplinary Interaction Design in Design Education
Blevis, E., Koskinen, . I. L. K., Lee, . K. U-P., Bødker, S., Chen, . L. I-L., Lim, . Y. O., Wei, . H. U. & Wakkary, R. 2015 *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems*. Begole, B. & Kim, J. (red.). Association for Computing Machinery, s. 833-838 6 s.

Using IT to 'do good' in communities?
Bødker, S. 2015 I : Journal of Community Informatics. 11, 2

What to Study in HCI?
Hornbæk, K., Oulasvirta, . A. N., Reeves, S. & Bødker, S. 2015 *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems*. Begole, B. & Kim, J. (red.). Association for Computing Machinery, s. 2385-2388 4 s.

Between initial familiarity and future use – a case of Collocated Collaborative Writing
Bødker, S. & Polli, A. M. 2014 *COOP 2014 - Proceedings of the 11th International Conference on the Design of Cooperative Systems, 27-30 May 2014, Nice (France)*. Rossitta, C., Ciolfi, L., D. M. & Conein, B. (red.). Springer, 16 s.

Participatory IT in semi-public spaces
Bødker, S., Klokmose, C. N., Korn, M. & Polli, A. M. 2014 *Proceedings of the 8th Nordic Conference on Human-Computer Interaction, NordiCHI '14: Fun, Fast, Foundational*. Roto, V., Häkkilä, . J. O., Väänänen-Vainio-Mattila, K. & Juhlin, O. (red.). Association for Computing Machinery, s. 765-774 10 s.

Boundaries, work and the rest
Bødker, S. 2013

Calendars: Time coordination and overview in families and beyond
Bødker, S. & Grönvall, E. 2013 *ECSCW 2013 : Proceedings of the 13th European Conference on Computer Supported Cooperative Work, 2013*. Bertelsen, O. W., Ciolfi, L., Grasso, M. A. & Papadopoulos, G. A. (red.). Springer-VS, s. 63-81 18 s.

CHI '13 Extended Abstracts on Human Factors in Computing Systems: ACM SIGCHI Conference, Paris, France — April 27 - May 02, 2013
Mackay, . W. E. (red.), Brewster, S. (red.) & Bødker, S. (red.) 2013 Association for Computing Machinery. 3320 s.

Feedback
Bødker, S. & Petersen, M. G. 2013 I : Interactions (New York). 20, 1, s. 6-9 4 s.

From Persona to Techsona
Bødker, S. & Klokmose, C. N. 2013 *Human-Computer Interaction – INTERACT 2013: 14th IFIP TC 13 International Conference, Cape Town, South Africa, September 2-6, 2013, Proceedings, Part IV*. Kotzé, P.,

Marsden , G., Lindgaard, G., Wesson, J. & Winckler , M. (red.). Springer-VS, s. 842-349 8 s. (Lecture Notes in Computer Science, Vol. 8120).

Introduction to the Special Issue on Practice-Oriented Approaches to Sustainable HCI
Pierce, J., Strengers, Y., Sengers, P. & Bødker, S. 2013 I : A C M Transactions on Computer - Human Interaction. 20, 4, 8 s., 20

Participation, civic engagement and Web 2.0 – three cases
Bødker, S. & Zander, P-O. M. 2013

Practice-oriented approaches to Sustainable HCI: A Special Issue of ACM Transactions on Computer-Human Interaction (ACM TOCHI)
Pierce, J. (red.), Strengers, Y. (red.), Sengers, P. (red.) & Bødker, S. (red.) 2013 I : A C M Transactions on Computer - Human Interaction. 20, 4, 166 s.

Proceedings of the SIGCHI Conference on Human Factors in Computing Systems: ACM SIGCHI Conference, Paris, France — April 27 - May 02, 2013
Mackay, . W. E. (red.), Brewster, S. (red.) & Bødker, S. (red.) 2013 Association for Computing Machinery. 3498 s.

Domain crossing: how much expertise is enough?
Schraefel, M. C., Rouncefield, M., Kellogg, W., Ackerman, M., Marsden, G., Bødker, S., Wyche, S. & Reddy, M. 2012 *CSCW'12 : Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work Companion.* Poltrock, S. & Simone, C. (red.). Association for Computing Machinery, s. 29-32 4 s.

Dynamics in artifact ecologies
Bødker, S. & Klokmose, C. N. 2012 *NordiCHI '12 : Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design* . Association for Computing Machinery, s. 448-457 10 s.

Looking ahead – How field trials can work in iterative and exploratory design of ubicomp systems
Korn, M. & Bødker, S. 2012 *UbiComp '12 : Proceedings of the 2012 ACM Conference on Ubiquitous Computing.* Association for Computing Machinery, s. 21-30 10 s.

Modeling Is Not the Answer! Designing for Usable Security
Bødker, S., Mathiasen, N. R. & Petersen, M. G. 2012 I : Interactions (New York). 19, 5, s. 54-57 4 s.

Personas, people and participation–challenges from the trenches of local government
Bødker, S., Christiansen, E. T., Nyvang, T. & Zander, P-O. 2012 I : P D C. 2012, 1, s. 91-100 10 s.

Poetry in motion: appropriation of the world of Apps
Bødker, S. & Christiansen, E. T. 2012 *Proceedings of the 30th European Conference on Cognitive Ergonomics, ECCE '12* . Turner, P. & Turner , S. (red.). Association for Computing Machinery, s. 78-84 7 s.

Preparing Students for (Inter-)Action with Activity Theory
Bødker, S. & Klokmose, C. N. 2012 I : International Journal of Design. 6, 3, s. 99-111 12 s.

ECSCW 2011: Proceedings of the 12th European Conference on Computer Supported Cooperative Work, 24-28 September 2011, Aarhus, Denmark
Bødker, S. (red.), Bouvin, N. O. (red.), Lutters, W. (red.), Wulf, V. (red.) & Ciolfi, L. (red.) 2011 Springer. 417 s.

ECSCW 2011 Conference Supplement: European Conference on Computer-Supported Cooperative Work, Aarhus 24.-28. September 2011
Bødker, S. (red.) 2011 Department of Computer Science, University of Aarhus, 54 s. (DAIMI PB; Nr. 594).

Experiencing Security in Interaction Design
Mathiasen, N. R. & Bødker, S. 2011 *Proceedings of the 2011 annual Conference on Human Factors in Computing Systems.* Association for Computing Machinery, s. 2325-2334 10 s.

International Reports on Socio-Informatics (IRSI): Special Issue. Vol. 8, Issue 2. Proceedings of the C&T 2011 Workshop on Government and Citizen Engagement
Borchorst, N. G. (red.), Bødker, S. (red.), Colineau, N. (red.), Korn, M. (red.), Paris, C. (red.), Pipek, V. (red.) & Rohde, M. (red.) 2011 The International Institute for Socio-Informatics, Bonn. 67 s. (International Reports on Socio-Informatics; Nr. 2, Vol. 8).

Introduction to the Workshop on Government and Citizen Engagement
Anderson, S., Borchorst, N. G., Bødker, S., Colineau, N., Dennett, A., Korn, M. & Paris, C. 2011 I : International Reports on Socio-Informatics. 8, 2, s. 5-7 3 s.

Public deliberation in municipal planning: supporting action and reflection with mobile technology
Bohøj, M., Borchorst, N. G., Bødker, S., Korn, M. & Zander, P-O. 2011 *Proceedings of the 5th International Conference on Communities and Technologies* . Association for Computing Machinery, s. 88-97 10 s.

The Human-Artifact Model: An Activity Theoretical Approach to Artifact Ecologies
Bødker, S. & Klokmose, C. N. 2011 I : Human - Computer Interaction (Mahwah). 26, 4, s. 315-371 57 s.

Use is everywhere and changing: Analysis and design with the Human-Artifact Model
Bødker, S. 2011 *Proceedings of the 29th Annual European Conference on Cognitive Ergonomics* . Association for Computing Machinery, s. 3-10 8 s.

While working around security
Mathiasen, N. R., Bødker, S. & Petersen, M. G. 2011

"You probably shouldn't give them too much information" – Supporting Citizen-Government Collaboration
Borchorst, N. G. & Bødker, S. 2011 *ECSCW 2011: Proceedings of the 12th European Conference on Computer Supported Cooperative Work*. Bødker, S., Bouvin, N. O., Lutters, W., Wulf, V. & Ciolfi, L. (red.). Springer, s. 173-192 20 s.

A short review to the past and present of participatory design – introduction to debate section
Bødker, S. & Pekkola, S. 2010 I : Scandinavian Journal of Information Systems. 22, 1, 5 s.

Between casual commitment and cross-media articulation – the faith of the Napkin
Bødker, S. & Petersen, A. B. 2010 *From CSCW to Web 2.0: European Developments in Collaborative Design : Selected Papers from COOP08*. Randall, D. & Salembier, P. (red.). Springer, s. 115-129 14 s. (Computer Supported Cooperative Work).

Design for Collaboration in Health Care: Experiences from Highly Specialized Surgical Care in Sweden
Bødker, S., Schroll, J. & Groth, K. 2010

Timeline Collaboration
Bohøj, M., Borchorst, N. G., Bouvin, N. O., Bødker, S. & Zander, P-O. 2010 *Proceedings of the 28th International Conference on Human factors in computing Systems. CHI '10* . Association for Computing Machinery, s. 523-532 10 s.

A sense of direction for participatory design?
Bødker, S. 2009 *Learning and expanding with activity theory*. Sannino, A. L., Daniels, H. & Gutiérrez, K. (red.). Cambridge UK: Cambridge University Press, s. 274-285

Executive Summary - Barselsorlov
Zander, P-O., Bødker, S. & Borchorst, N. G. 2009

The boundaries of participatory citizenship
Bødker, S., Zander, P-O. & Borchorst, N. G. 2009 *Proceedings of the 11th European Conference on Computer Supported Cooperative Work, (ECSCW)*. Wagner, I., Tellioglu, H., Balka, E., Simone, C. & Ciolfi, L. (red.). Springer, s. 1-20 20 s.

A layered approach to user-centered security
Bødker, S. 2008 *Proceedings of the 5th Nordic conference on Human-Computer Interaction*. Association for Computing Machinery

Between casual commitment and cross-media articulation – the faith of the Napkin
Bødker, S. & Petersen, A. B. 2008 *Proceeding of the 8th International Conference on the Design of Cooperative Systems 2008: COOP'08: Conference on the Design of Cooperative Systems 2008*. Hassanaly, P., Ramrajsingh, A., Randall, D., Salembier, P. & Tixier, M. (red.). Institut d'Etudes Politiques d'Aix-en-Provence, s. 75-84 10 s.

Design for reconfiguration
Bødker, S. 2008 *SIGDOC 2008,: Proceedings of the 26th ACM International Conference on **Design of Communication***. Costa, C. J., Protopsaltis, A., Aparício, M. & O'Neill, H. (red.). Association for Computing Machinery, Vol. Talk 3: Rigo Award Winner, s. 263-265 2 s.

Don't Get Emotional: Affect and Emotion in Human-Computer Interaction. From Theory to Applications
Bødker, S. & Palen, L. A. 2008 I : Lecture Notes in Computer Science. 4868, s. 12-22 10 s.

Framework for expanding e-government: the eGov+ project.
Bødker, S., Kræmmergaard, P., Nyvang, T. & Ellen, C. 2008

Meeting (in) the wild
Bødker, S. & Bohøj, M. 2008 *Proceedings of the 5th Nordic Conference on Human-Computer Interaction 2008*. ACM Conference on Computer-Human Interaction, Vol. 358

Threats or threads: from usable security to secure experience
Bødker, S. & Mathiasen, N. R. 2008 *ACM International Conference Proceeding Series: Proceedings of the 5th Nordic conference on Human-computer interaction: building bridges*. Tollmar, K. & Jönsson, B. (red.). Association for Computing Machinery, Vol. 358, s. 283-290 8 s.

Usability and Interaction Design - New Challenges for the Scandinavian Tradition
Bødker, S. & Sundblad, Y. 2008 I : Behaviour and Information Technology. 27, 4, s. 293-300 8 s.

It is still a STAR
Bødker, S. 2007 *HCI Remixed**. Reflections on Works That Have Influenced the HCI Community*. Erickson, T. & McDonald, D. (red.). MIT Press, s. 49-55 6 s.

Multiple and Ubiquitous Interaction, 28. - 30. March 2007: Book of Abstracts
Brodersen, A. C. (red.), Bødker, S. (red.) & Klokmose, C. N. (red.) 2007 Aarhus, Denmark. 51 s. (Daimi Reports; Nr. PB-581).

Orientering 11. oktober 2007 kl. 17:10 på P1
Bødker, S. 2007 Lyd- og billedmedier.

Quality of Learning in Ubiquitous Interaction
Bødker, S., Brodersen, A. C. & Klokmose, C. N. 2007 *Proceedings of European Conference on Cognitive Ergonomics 2007: The 25th Anniversary Conference of the European Association of Cognitive Ergonomics (EACE).* lulu, Inc, s. 121-129 8 s.

Seeds of Cross-Media Production
Bødker, S. & Petersen, A. B. 2007 I : Computer Supported Cooperative Work. 16, 6, s. 539-566 27 s.

Ubiquitous Substitution
Bødker, S., Klokmose, C. N. & Brodersen, A. C. 2007 *Proceedings of 11th IFIP TC 13 International Conference.* Springer, Vol. 4662/2007, s. 179-192 14 s. (Lecture Notes in Computer Science; Nr. 4662).

A comparative study of map use
Bouvin, N. O., Brodersen, A. C., Bødker, S., Hansen, F. A. & Klokmose, C. N. 2006 *Proceedings of CHI '06: CHI '06 extended abstracts on Human Factors in Computing Systems.* ACM Spring Proceedings, s. 592-597 5 s.

Can we measure quality in design and do we need to?: Panel
Bødker, S., Sutcliffe, A., Karat, J. & Gavel, B. 2006 *Proceedings of the 6th ACM conference on Designing Interactive systems.* Association for Computing Machinery, s. 119-121

Computer support for social awareness in flexible work
Bødker, S. & Christiansen, E. 2006 I : Computer Supported Cooperative Work. 15, 1, s. 1-28 28 s.

Computer support for social awareness in flexible work
Bødker, S. & Christiansen, E. 2006 I : Computer Supported Cooperative Work. 15, 1, s. 1-28 27 s.

HCI Knowledge - Fit for Transfer, Share or Co-Construction
Bertelsen, O. W., Bødker, S., McEwan, T., Procter, R. & Svanæs, D. 2006 *The 19th British HCI Group Annual Conference, Napier University..* s. 341-343 3 s.

Proceedings of the Conference on Designing Interactive Systems, University Park, PA, USA, June 26-28, 2006
Carroll, J. M. (red.), Bødker, S. (red.) & Coughlin, J. (red.) 2006 Society for Industriel & Applied Mathematics.

When second wave HCI meets third wave challenges
Bødker, S. 2006 *Proceedings of the 4th Nordic conference on Human-computer interaction: changing roles NordiCHI '06.* Association for Computing Machinery, s. 1-8 8 s.

Complex Mediation
Bødker, S. & Andersen, P. B. 2005 I : Journal of Human Computer Interaction. 20, 4, s. 353-402 49 s.

Gate Keeping or Bridge Building? - Cooperation, Learning and Boundary Working in a Cross-media Workplace
Bødker, S., Bjerrum, E., Lauritzen, S. A. & Petersen, A. B. 2005 *OLKOS 2005.* 15 s.

Mediating the co-production of complex media products
Bødker, S. & Petersen, A. B. 2005

Mediating the co-production of complex media products
Bødker, S. & Bechmann, A. 2005

Nordic-Scottish HCI, panel for HCI2005, Edinburgh
Bødker, S. 2005 *The 19th British HCI Group Annual Conference.* 1 s.

Designing for ephemerality and prototypicality
Bødker, S. & Christiansen, E. 2004 *Proceedings of the 5th Conference on Designing Interactive Systems: processes, practices, methods, and technique.* Association for Computing Machinery, s. 255 - 260 6 s.

Desktop Computing
Bødker, S. & Nielsen, M. M. 2004 I : Australian Journal of Information Systems, Special Issue. s. 88-101 13 s.

Desktop Computing
Bødker, S. & Nielsen, M. M. 2004 *Proceedings of the 2nd annual OZCHI conference.* University of Wollongong, Australia, 13 s.

Fra bruger undersøgelse til færdig løsning eller product
Bødker, S. 2004

A for Alternatives
Bødker, S. 2003 I : Scandinavian Journal of Information Systems. 15, s. 87-89 3 s.

Activity Theory
Bertelsen, O. W., Bødker, S. & Caroll, J. M. (red.) 2003 *HCI Models, Theories and Frameworks: Toward an Interdisciplinary Science.* Elsevier: Morgan Kaufmann, Vol. Chapter 11, s. 291-324 34 s.

Learning and living in the "New office"
Bjerrum, E., Bødker, S., Dourish, P. (red.) & Schmidt, K. (red.) 2003 *Proceedings of the 2003 Eighth European Conference on Computer-Supported Cooperative Work*. Kuutti, K., Karsten, E. H., Dourish, P., Fitzpatrick, G. & Schmidt, K. (red.). Kluwer Academic Publishers, s. 199-218 20 s.

Post-cognitivist HCI: second-wave theories
Kaptelinin, V., Nardi, B., Bødker, S., Carroll, J., Hollan, J., Hutchins, E. & Winograd, T. 2003 *Ikke angivet*. Cockton, G. & Korhonen, P. (red.). Association for Computing Machinery, s. 692-693 2 s.

Special Issue: "Interacting with Household Technologies"
Baillie, L. (red.), Benyon, D. (red.), Bødker, S. (red.) & Macauley, C. (red.) 2003 I : Cognition, Technology and Work. 5, 1

Technology for Boundaries
Bødker, S., Kristensen, J. F., Nielsen, C. & Sperschneider, W. 2003 *Proceedings of the 2003 international ACM SIGGROUP conference on Supporting group work*. Association for Computing Machinery, s. 311-320 10 s.

Activity theory
Bødker, S. & Bertelsen, O. W. 2002 *HCI Models, Theories and Frameworks*. Carroll, J. M. (red.). Morgan Kaufman, s. 291-324

Discontinuities
Bødker, S. & Bertelsen, O. W. 2002 *Social thinking - software practice*. Floyd, C., Dittrich, Y. & Ralf, K. (red.). MIT Press, s. 409-424

Interaction through multi-artifacts
Bertelsen, O. W. & Bødker, S. 2002 *Proceedings of the 11th European Conference on Cognitive Ergonomics*. Bagnara, S., Pozzi, S., Rizzo, A. & Wright, P. K. (red.). European Association of Cognitive Ergonomcs, 1 s.

Lost and Found in Flexibility
Bødker, S. & Christiansen, E. 2002 *Proceedings of the 25th Information Systems Research Seminar in Scandinavia*. Bødker, K., Pedersen, M. K., Simonsen, J. & Vendelø, M. T. (red.). Human-Computer Interaction Resource Network, 7 s.

Proceedings of the Second Nordic Conference on Human-Computer Interaction. NordiCHI '02
Bødker, S. (red.), Bertelsen, O. (red.) & Kuutti, K. (red.) 2002 Association for Computing Machinery.

Staging a Professional Participatory Design Practice: Moving PD beyond the Initial Fascination of User Involvement
Bødker, S. & Iversen, O. S. 2002 *Proceedings of the second Nordic conference on Human-computer interaction*. Bertelsen, O. W. (red.). Association for Computing Machinery, s. 11 - 18 8 s.

Staging a Professional Participatory Design Practice
Bødker, S. & Iversen, O. S. 2002 *Proceedings of Second Nordic Conference on Human-Computer Interaction*. Aarhus, s. 11-18 8 s.

The Design Collaboratorium - a place for usability design
Bødker, S. & Buur, J. 2002 I : A C M Transactions on Computer - Human Interaction. 9, 2, s. 152-169 18 s.

Cooperation in massively distributed information spaces
Bertelsen, O. W. & Bødker, S. 2001 *Proceedings of the seventh conference on European Conference on Computer Supported Cooperative Work*. Kluwer Academic Publishers, s. 1-17 18 s.

The interactive design collaboratorium
Bødker, S., Petersen, M. G. & Krogh, P. G. 2001 *Human-Computer Interaction - INTERACT '01*. IOS Press, s. 51-58 8 s.

Cooperative Design
Bødker, S., Grønbæk, K. & Mogensen, P. H. 2000 *Encyclopedia of Library and Information Science*. Kent, A. (red.). New York: Marcel Dekker Incorporated, Vol. 67, s. 108-119 11 s.

Cooperative design perspectives on 20 years with "the Scandinavian IT Design Model"
Bødker, S., Ehn, P., Sjögren, D. & Sundblad, Y. 2000 *Proceedings of the first Nordic conference on Human-computer interaction*. Association for Computing Machinery

Coordinating technical support platforms
Bødker, S. 2000 I : Association for Computing Machinery. Communications. 43, 11

Creativity, cooperation and interactive design
Bødker, S., Petersen, M. G. & Brodersen, A. C. 2000 *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques*. Association for Computing Machinery, s. 252-261 10 s.

Design for learning in use
Bødker, S. & Petersen, M. G. 2000 I : Scandinavian Journal of Information Systems. 12, s. 61-80 20 s.

From usability lab to design collaboratorium: reframing usability practice

Bødker, S. & Buur, J. 2000 *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques.* Association for Computing Machinery, s. 297-307
Introduction to special issue on activity theory and information systems design
Bødker, S. & Bertelsen, O. W. 2000 I : Scandinavian Journal of Information Systems. 12, s. 3-14 12 s.
Scenarios - setting the stage for reflection and action in user-centered design
Bødker, S. 2000 I : Interacting with Computers. 13, 1, s. 61-77 17 s.
Computer applications as Mediators of Design and Use
Bødker, S. 1999 Department of Computer Science, Aarhus University, 99 s.
Proceedings of the sixth European Conference on Computer-Supported Cooperative Work. EC-CSCW '99
Bødker, S. (red.), Kyng, M. (red.) & Schmidt, K. (red.) 1999 Kluwer Academic Publishers.
Scenarios in User-Centered Design - Setting the Stage for Reflection and Action
Bødker, S. 1999 *Proceedings of the 32nd annual Hawaii International Conference on System Sciences.* IEEE Computer Society Press
Context: An active Choice in Usability Work
Bødker, S. & Madsen, K. H. 1998 I : Interactions (New York). 4, s. (17-25) 9 s.
Multimedia: Interdisciplinary challenges to design
Grønbæk, K. & Bødker, S. 1998 I : Scandinavian Journal of Information Systems. 10, 1-2, 5 s.
Studying programming environments in use: Between principles and praxis
Bødker, S. & Bertelsen, O. W. 1998 *Proceedings of NWPER '98: Nordic workshop on programming environment research.*
The artifacts of boundary crossing in systems design
Bødker, S. 1998
Understanding representations in design
Bødker, S. 1998 I : Human - Computer Interaction (Mahwah). 13, 2, s. 107-125
Usability work: From snapshot to development of use
Bødker, S. & Petersen, M. G. 1998
Computers in mediated human activity
Bødker, S. 1997 I : Mind, Culture, and Activity. 4, 3, s. 149-158 10 s.
Constructing Common Information Spaces
Bødker, S. & Bannon, L. J. 1997 *Proceedings of ECSCW 97.* Kluwer Academic Publishers, s. 81-96
Interative design, hands-on experience and guiding lights
Bødker, S. 1997 *Proceedings of the SIGCHI conference on Human factors in computing systems.* Association for Computing Machinery
Scenarios as springboards in design
Bødker, S. & Christiansen, E. 1997 *Social Science Research, Technical Systems and Cooperative Work.* Bowker, G., Star, S. L., Gasser, L. & Turner, W. (red.). Lawrence Erlbaum Associates, Incorporated, s. 217-234
Applying activity theory to video analysis: how to make sense of video data in HCI
Bødker, S. 1996 *Context and consciousness: Activity theory and human computer interaction.* Nardi, B. (red.). MIT Press, s. 147-174
Creating conditions for participation: conflicts and resources in systems design
Bødker, S. 1996 I : Human - Computer Interaction (Mahwah). 11, s. 215-236
Mediating technical platforms to support the development of shared work practices
Bødker, S. 1996 *Proceedings of the 4th Software Cultures Workshop.* s. 91-102 11 s.
Understanding computer applications in use - a human activity analysis
Bødker, S. 1996 *Signs at work.* Bøgh Andersen, P., Holmquist, B., Klein, H. & Possner, R. (red.). Walter de Gruyter, s. 325-348
A conceptual toolbox for designing CSCW applications
Bødker, S. & Christiansen, E. 1995 *COOP'95: Proceedings of the First International Workshop on the Design of Cooperative Systems* . INRIA Press, s. 266-284 18 s.
A conceptual toolbox for designing CSCW applications
Bødker, S., Christiansen, E. & Thüring, M. 1995 Department of Computer Science, Aarhus University, 20 s.
Cooperative Design: Techniques and Experiences from the Scandinavian Scene
Bødker, S., Grønbæk, K. & Kyng, M. 1995 *Readings in Human-Computer Interaction: Toward the Year 2000.* Baecker, R., Grudin, J., Buxton, W. & Greenberg, S. (red.). Morgan-Kaufmann, s. 215 224 s.
Deliverable 1.4.2: The EuroCODE conceptual framework: Preliminary
Bødker, S. & Bouvin, N. O. 1995 Department of Computer Science, Aarhus University.
Users and Designers in Mutual Activity - an analysis of cooperative activities in systems design

Bødker, S. & Grønbæk, K. 1995 *Cognition and communication at work.* Engeström, Y. & Middleton, D. (red.). Cambridge University Press, s. 130-158

Creating conditions for participation: Conflicts and resources in systems design
Bødker, S. 1994 *Proceedings of PDC '94.* Association for Computing Machinery, s. 13-20

Datalogi i Gymnasiet: en diskussion af bekendtgørelse
Bødker, S. & Knudsen, J. L. 1994 I : EDB og Undervisning. 50, 6 s.

From implementation to design: tailoring and the emergence of systematization in CSCW
Bødker, S. & Trigg, R. 1994 *Proceedings of the 1994 ACM conference on Computer supported cooperative work.* Association for Computing Machinery, s. 45-54 9 s.

Achieving cooperative system design
Bødker, S., Grønbæk, K., Bannon, L. & Grudin, J. 1993 *Participatory design: principles and practices.* Schuler, D. & Namioka, A. (red.). Lawrence Erlbaum Associates, Incorporated, s. 79-98

Cooperative design: Techniques and experiences from the Scandinavian scene
Bødker, S., Grønbæk, K. & Kyng, M. 1993 *Participatory design. Principles and practices.* Schuler, D. & Namioka, A. (red.). Lawrence Erlbaum Associates, Incorporated, s. 157-176

Design of information systems - things versus people
Bødker, S. & Greenbaum, J. 1993 *Gendered by design?.* Green, E., Oven, J. & Pain, D. (red.). Taylor & Francis, s. 53-63

Gender, Culture and Technology: Introduction to Special issue
Bødker, S. & Markussen, R. 1993 I : A I & Society. 7, 4, s. 275-279 4 s.

Historical analysis and conflicting perspectives - Contextualizing HCI
Bødker, S. 1993 *Human-Computer Interaction: Third International Conference, EWHCI '93 Moscow, Russia, August 3-7, 1993 Selected Papers.* Bass, L. J., Gornostaev, J. & Unger, C. (red.). Springer, s. 1-10 10 s. (Lecture Notes in Computer Science, Vol. 753).

One Woman's job is another man's articulation work
Bødker, S. & Mogensen, P. H. 1993 *Developing CSCW Systems: Design Concepts. Report of COST14 'CoTech' Working Group 4.* Schmidt, K. (red.). Risø National laboratory

Re-framing research in human-computer interaction from the point-of-view of activity theory?
Bødker, S. 1993 Department of Computer Science, Aarhus University

The AT project. Practical Research in Cooperative Design
Markussen, R., Mogensen, P. H., Bødker, S., Christiansen, E., Ehn, P. & Trigg, R. 1993 *The AT Project.* Department of Computer Science, University of Aarhus, Vol. DAIMI PB-454, 35 s.

Technology as a vehicle for Organisational Learning and Change
Bødker, S. 1992 Department of Computer Science, Aarhus University, 14 s.

The Man in the Woman in the Researcher
Bødker, S., Christiansen, E. T., Markussen, R. & Lytje, I. 1992

Activity theory as a challenge to systems design
Bødker, S. 1991 *Information Systems Research: Contemporary Approaches and Emergent Traditions.* Nissen, H-E., Klein, H. K. & Hirscheim, R. (red.). North-Holland, s. 555-564 10 s.

Activity theory as a challenge to systems design
Bødker, S. 1991 Department of Computer Science, Aarhus University, 18 s.

Beyond the interface: Encountering artifacts in use
Bødker, S. & Bannon, L. 1991 *Psychological theory of the Human-Computer Interface: Designing interaction: psychology at the human-computer interface.* Carroll, J. M. (red.). Cambridge University Press, s. 227-253 26 s.

Computers in Context. Report from the AT-project in progress
Bødker, S., Christiansen, E. T., Ehn, P., Markussen, R., Mogensen, P. H. & Trigg, R. 1991 *Proceedings of NES/SAM.* s. 153-158 5 s.

Cooperative Prototyping Studies - users and designers envision a dental case record system
Bødker, S. & Grønbæk, K. 1991 *Studies in computer supported cooperative work: theory, practice and design (Human Factors in Information Technology).* Bowers, J. & Benford, S. (red.). North-Holland, s. 315-332 17 s.

Cooperative Prototyping: Users and Designers in Mutual Activity
Grønbæk, K. & Bødker, S. 1991 *Computer Supported Cooperative Work and Groupware.* Greenberg, S. (red.). Academic Press, s. 331-359 28 s.

Cooperative Prototyping: Users and Designers in Mutual Activity
Bødker, S. & Grønbæk, K. 1991 I : International Journal of Human-Computer Studies. 34, 3, s. 453-478 25 s.

Design in action: From prototyping by demonstration to cooperative prototyping

Bødker, S. & Grønbæk, K. 1991 *Design at work: Cooperative design of computer systems.* Kyng, M. & Greenbaum, J. (red.). Lawrence Erlbaum Associates, Incorporated, s. 197-218 21 s.

Designing artifacts for human work

Bødker, S. 1991 *Proceedings of the first Oksnøen Symposium.*

Open-Ended Interaction in Cooperative Pro-to-typing: A Video-based Analysis

Bødker, S., Grønbæk, K. & Trigg, R. 1991 I : Scandinavian Journal of Information Systems. 3, s. 63 - 86 23 s.

Setting the stage: workshops and group interaction

Bødker, S., Kyng, M. & Greenbaum, J. 1991 *Design at work: Cooperative Design of Computer Systems.* Kyng, M. & Greenbaum, J. (red.). Lawrence Erlbaum Associates, Incorporated, s. 139-154 15 s.

Through the Interface - a Human Activity Approach to User Interface

Bødker, S. 1991 Lawrence Erlbaum Associates, Incorporated.

A Video-based Analysis of the Cooperative Prototyping Process

Trigg, R., Bødker, S. & Grønbæk, K. 1990 *Proceedings of the 13th IRIS conference.* Hellman, R., Ruohonen, M. & Sørgaard, P. (red.).

A human activity approach to User Interfaces

Bødker, S. 1989 I : Human - Computer Interaction (Mahwah). 4, 3, s. 171-195 15 s.

Cooperative Prototyping Experiments: Users and Designers Envision a Dental Case Record System

Bødker, S. & Grønbæk, K. 1989 *Proceedings of the first European Conference on Computer Supported Cooperative Work: EC-CSCW '89.* Bowers, J. & Benford, S. (red.). Computer Sciences House, Slough, UK, s. 343-357 15 s.

Cooperative Prototyping Experiments - Users and Designers Envision a Dental Case Record System

Bødker, S. & Grønbæk, K. 1989 Department of Computer Science, Aarhus University, 31 s.

A Feeling for Systems Development Work - Design of the ROSA Project

Bødker, S. & Greenbaum, J. 1988 Department of Computer Science, Aarhus University, 16 s.

A feeling for Systems Development Work - Design of the ROSA project

Bødker, S. & Greenbaum, J. 1988 *Women, Work and Computerization: Forming New Alliances.* Tijdens, K. G., Jennings, M., Wagner, I. & Weggelaar, M. (red.). North-Holland, s. 161-170 10 s.

A Non-Trivial Pursuit - Systems Development as Cooperation

Bødker, S. & Greenbaum, J. 1988 Department of Computer Science, Aarhus University, 23 s.

A Non-Trivial Pursuit - Systems Development as Cooperation

Bødker, S. & Greenbaum, J. 1988 *Report of the 11th IRIS.* Kaasbøll, J. (red.). s. 102-122 20 s.

Computer Support for Coooperative Design

Bødker, S., Ehn, P., Knudsen, J., Kyng, M. & Madsen, K. H. 1988 *Prooceedings of the Conference on Computer-Supported Cooperative Work.* Society for Industriel & Applied Mathematics, s. 377-394 18 s.

Computer Supported Cooperative Work

Bødker, S., Ehn, P., Knudsen, J., Kyng, M. & Madsen, K. 1988 *Proceedings of the 1988 ACM conference on Computer-supported cooperative work.* Association for Computing Machinery, s. 377-394 17 s.

A Utopian Experience: On design of Powerful Computer-based tools for skilled graphic workers

Bødker, S., Kyng, M., Ehn, P., Kammersgaard, J. & Sundblad, Y. 1987 *Computers and Democracy - a Scandinavian challenge.* Bjerknes, G., Ehn, P. & Kyng, M. (red.). Gower Publishing Ltd, s. 251-278 27 s.

A utopian experience: on design of powerful computer-based tools for skilled graphic workers

Bødker, S., Ehn, P., Kammersgaard, J., Kyng, M. & Sundblad, Y. 1987 *Computers and democracy - A Scandinavian challenge.* Bjerknes, G., Ehn, P. & Kyng, M. (red.). Avebury, s. 251-278 28 s.

Prototyping revisited - design with users in a cooperative setting

Bødker, S. 1987 Department of Computer Science, Aarhus University, 27 s.

Prototyping revisited - design with users in a cooperative setting

Bødker, S. 1987 *Report of the 10th IRIS.* Järvinen, P. (red.). s. 71-92 22 s.

Through the Interface - a human activity approach to user interfaces

Bødker, S. 1987 Department of Computer Science, Aarhus university. 192 s. (DAIMI PB; Nr. 224).

More or Less Systems Description

Bødker, S. & Halskov, K. 1986 *Report of the Eighth Scandinavian Research Seminar on Systemeering.* Lassen, M. & Mathiassen, L. (red.). Department of Computer Science, Aarhus University, s. 57-67 11 s.

UTOPIA and the Design of User Interfaces

Bødker, S. 1985 *Precedings of the Working Conference on Development and Use of Computer-based Systems and Tools.* Department of COmputer Science, Aarhus University, s. 109-124 15 s.

ISAC - A Case Study of Systems Description Tools

Bødker, S. & Hammerskov, J. 1984 *Proceedings from the Seventh Scandinavian Research Seminar on Systemeering.* Sääksjärvi, M. (red.). s. 201-210 10 s.

ISAC - A Case Study of Systems Despription Tools
Bødker, S. & Hammerskov, J. 1984 Department of Computer Science, Aarhus University

Priser
Best paper awards at HICSS (1999) and IRIS (2002).
ACM SigDOC Rigo award 2008 for extraordinary lifelong achievements "for her contributions to participatory design, computer-supported cooperative work and human-computer interaction".
Member of ACM CHI Academy 2010.

Projekter
1.UTOPIA, a research project in co-operation with Arbetslivscentrum and the Royal Technical University in Stockholm and the Nordic Graphic Workers' Union (1983-84).
2.The research program on Computer Support for Cooperative Design and Communi¬cation (Coop). FTU/Danish Natural Science Research Council. (1987-1989).
3.The AT-project, a collaboration project with the Aarhus office of the Danish National Labor Inspection (1990-1993). Project manager.
4.The Devise project, Danish Research Program for Informatics, (1990-1994).
5.The EC Esprit project EuroCODE. (1992-1995).
6.BIDI - usability work in Danish Industry, a collaboration project with Danfoss, Kommu¬nedata and Bang & Olufsen, the National Center for IT-Research, 1997-1999. Project manager.
7.BITEL - a collaboration project with UNI-C and Danish University of Pedagogics, 2000-2003.
8.Center for Human-Machine Interaction, Grundforskningsfonden, 1998-2003. Member of management board and project manager.
9.New Ways of Working, Alexandra Institute, 2000-. Research director. www.nwow.alexandra.dk
10.Center for pervasive computing, 2000-2004. Member of management board, project manager.
11.Researcher, ContextIT 2003.
12.Researcher EU FET IP PalCOM 2003- 2006. www.ist-palcom.org
13.UUID - Ubiquitous User Interface Design - a theory-driven approach to ubiquitous user interfaces and their design, STVF 2005-2008, Research director. www.daimi.au.dk/uuid
14.NIAS – Network for Innovative Administrative Systems, senior researcher, 2006. http://www.alexandra.dk/forskning/CIAS.htm
15.ITSCI - IT Security for Citizens – senior researcher 2007-.
16.eGov+ Exploring design and use of transparent and tailorable IT in local government, beyond Web 2.0. Project manager 2008-
17. AU ICenter Participatory IT 2013-
18. CIBIS 2014-
19. Foundata 2016-
CIBIS 2014-
19. Foundata 2016-

Bevillinger
1.BIDI, 1997-1999, CIT, 3.025.000 dkk
2.CHMI, 1998-2002, Danmarks Grundforskningsfond, total 9,5 mio DKK, DI share: 4.75 mio DKK.
3.BiTel, 2000-2003, CIT and UNIC (CIT: 984000 DKK, UNIC: 1,3 mio DKK)
4.NWOW, 2001-2006, City and county of Aarhus, Alexandra Institute, 4,3 mio DKK.
5.Convivio, 2003-2004, EU Network of Excellence, 106.776 DKK (AU share)
6.STVF personal, 2003, STVF, 40.000 DKK.
7.STVF UUID 2005, 1.800.000 DKK.
8.NABIIT eGov+, 8.000.000 DKK, total budget 16.000.000.
9. AU ICenter PIT
10. CIBIS
11. Foundata

Aktiviteter
5th Decennial Aarhus Conference - Critical Alternatives
Bødker, S. (Arrangør)
1 jan. 2015 → 30 jun. 2015
Workshop un User-Centered Security
Bødker, S. (Arrangør)
19 okt. 2008
Workshop Proposal: Cooperative Technologies in Democratic Processes – Beyond e-Voting
Bødker, S. (Arrangør)
27 maj 2014

Workshop on Participation - basic concepts and research challenges at PDC 2012
Bødker, S. (Arrangør)
13 aug. 2012
Women in Academia
Bødker, S. (Deltager)
18 maj 2009 → 19 maj 2009
What to Study in HCI?
Bødker, S. (Arrangør)
5 maj 2015
VTU (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2006 → 1 okt. 2009
Videnskabelig uredelighed - Akademiet for talentfulde unge
Bødker, S. (Foredragsholder)
25 feb. 2012
Vetenskapsrådet, Sverige (Ekstern organisation)
Bødker, S. (Medlem)
5 maj 2014 → 30 sep. 2014
Vetenskabsrådet (Ekstern organisation)
Bødker, S. (Medlem)
8 sep. 2014 → 9 sep. 2014
UUID
Bødker, S. (Arrangør)
28 mar. 2007 → 30 mar. 2007
User participation in eGov+
Bødker, S. (Foredragsholder)
1 okt. 2009
"User Driven Innovation"
Bødker, S. (Oplægsholder)
26 maj 2011
Usability and Interaction Design - new challenges for the Scandinavian tradition
Bødker, S. (Foredragsholder)
22 maj 2007
University of Pretoria (Ekstern organisation)
Bødker, S. (Medlem)
13 apr. 2012
University of Eastern Finland (Ekstern organisation)
Bødker, S. (Medlem)
1 maj 2012 → 15 jun. 2012
Universitetet i Oslo (Ekstern organisation)
Bødker, S. (Medlem)
28 apr. 2009 → 11 sep. 2009
Udvalgene vedrørende videnskabelig uredelighed (Ekstern organisation)
Bødker, S. (Medlem)
1 okt. 2009 → 1 apr. 2013
Two talks
Bødker, S. (Foredragsholder)
24 nov. 2016
Tromsö Universitet (Ekstern organisation)
Bødker, S. (Medlem)
26 aug. 2009 → 10 dec. 2009
Transdisciplinary Interaction Design in Design Education: Panel
Bødker, S. (Foredragsholder)
8 maj 2015
Transactions on Computer-Human Interaction (Tidsskrift)
Bødker, S. (Redaktør)
3 feb. 2000 → ...
Tampere University of Technology (Ekstern organisation)

Bødker, S. (Medlem)
10 apr. 2014
Talk at Symposium on HCI Grand Challenges
Bødker, S. (Foredragsholder)
12 sep. 2016
Södertörn Högskola (Ekstern organisation)
Bødker, S. (Medlem)
1 aug. 2008 → 1 okt. 2008
Södertörn Høgskola (Ekstern organisation)
Bødker, S. (Medlem)
1 apr. 2008 → 1 okt. 2008
Studenterkonkurrence om fremtidens kontor (Ekstern organisation)
Bødker, S. (Medlem)
8 feb. 2006 → 23 mar. 2007
Usability and Interaction Design - new challenges for the Scandinavian tradition
Bødker, S. (Foredragsholder)
22 maj 2007
SCS, KTH
Bødker, S. (Gæsteforsker)
23 aug. 2009 → 15 nov. 2009
Samspillet mellem mennesker og teknologi
Bødker, S. (Foredragsholder)
17 jan. 2012
Rådgivning for Luxemburgs Forskningspåd, PhD-stipendier (Ekstern organisation)
Bødker, S. (Medlem)
28 okt. 2008 → 28 okt. 2009
Rådet for Teknologi og Innovation (Ekstern organisation)
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1 apr. 2012 → ...
Programkommite SCIS 2010 (Ekstern organisation)
Bødker, S. (Medlem)
3 mar. 2010 → 7 sep. 2010
Programkommite NordiCHI 2010 (Ekstern organisation)
Bødker, S. (Medlem)
28 feb. 2010 → 20 aug. 2010
Programkommite, Nordichi 2010 (Ekstern organisation)
Bødker, S. (Medlem)
18 feb. 2010 → ...
Programkommite International Symposium on End-User Development (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2013 → 1 maj 2013
Programkommite IHCI 2011 (Ekstern organisation)
Bødker, S. (Medlem)
28 okt. 2010 → 22 apr. 2011
Programkommite ICIC 2010 (Ekstern organisation)
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18 feb. 2010 → 7 maj 2010
Programkommite (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2013 → 1 jun. 2013
Programkommite, DIS 2010 (Ekstern organisation)
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18 feb. 2010 → 29 apr. 2010
Programkommite Coop 2010 (Ekstern organisation)
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28 feb. 2010 → 6 maj 2010
Programkommite, COOP 2010 (Ekstern organisation)
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1 feb. 2010 → 6 maj 2010

Programkommite Coop (Ekstern organisation)
Bødker, S. (Medlem)
2 feb. 2010 → 6 maj 2010
Programkommite APCHI (Ekstern organisation)
Bødker, S. (Medlem)
1 maj 2013 → 1 sep. 2013
Programkommite International Conference on Intercultural Collaboration, 2010 (Ekstern organisation)
Bødker, S. (Medlem)
5 apr. 2010 → 4 aug. 2010
Programkommite, @font-face { font-family: "Times"; }p.MsoNormal, li.MsoNormal, div.MsoNormal { margin: 6pt 0cm 0.0001pt; text-align: justify; font-size: 12pt; font-family: "Times New Roman"; }div.Section1 { page: Section1; } International Conference on Intercultural Collaboration, 2010. (Ekstern organisation)
Bødker, S. (Medlem)
28 feb. 2010 → 6 maj 2010
Programkommite, @font-face { font-family: "Times"; }p.MsoNormal, li.MsoNormal, div.MsoNormal { margin: 6pt 0cm 0.0001pt; text-align: justify; font-size: 12pt; font-family: "Times New Roman"; }div.Section1 { page: Section1; } SCIS 2010, (Ekstern organisation)
Bødker, S. (Medlem)
3 feb. 2010 → 6 maj 2010
Program committee GROUP 2007 (Ekstern organisation)
Bødker, S. (Medlem)
27 mar. 2007 → 27 jun. 2007
Program Committee, CSCW2016 (Ekstern organisation)
Bødker, S. (Medlem)
1 jun. 2015 → 20 aug. 2015
Program committee CHI 2016 (Ekstern organisation)
Bødker, S. (Medlem)
25 sep. 2015 → 12 dec. 2015
Professor i medieteknologi, Södertörn Högskola (Ekstern organisation)
Bødker, S. (Medlem)
24 nov. 2007 → 11 feb. 2008
Professerbedømmelse, IT-Universitetet Göteborg (Ekstern organisation)
Bødker, S. (Medlem)
1 nov. 2007 → 2 dec. 2007
PC NordiCHI 2004 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2004 → 1 maj 2004
PC NordiCHI 2000 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2000 → 1 maj 2001
PC Interact 2003 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2003 → 1 maj 2003
PC Interact 2001 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2001 → 1 maj 2001
PC ICSC- International conference on social computing 2001 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2001 → 1 maj 2001
PC Group 2003 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2003 → 1 maj 2003
PC ECSCW 2001 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2001 → 1 maj 2001
PC CUU 2003 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2003 → 1 maj 2003
PC CHI 2000 (Ekstern organisation)

Bødker, S. (Medlem)
1 jan. 2000 → 1 maj 2001
PC British HCI 2004 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2004 → 1 maj 2004
PC British HCI 2003 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2003 → 1 okt. 2003
PC British HCI 2003 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2003 → 1 maj 2003
PC British HCI 2002 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2002 → 1 maj 2002
PC ACM DIS 2002 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2002 → 1 maj 2002
 PC ACM DARE 2000 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2000 → 1 maj 2001
Participatory design meets municipal services - examples and issues from the eGov+ project
Bødker, S. (Foredragsholder)
22 okt. 2010
Participation, civic engagement and Web 2.0 – three cases
Bødker, S. (Foredragsholder)
15 nov. 2013
Papers-programkommite ACM CHI 2013 (Ekstern organisation)
Bødker, S. (Formand)
1 jan. 2012 → 1 okt. 2013
Panel-oplæg
Bødker, S. (Foredragsholder)
13 feb. 2012
NTNH (Ekstern organisation)
Bødker, S. (Medlem)
1 maj 2008 → 1 okt. 2008
Norges Forskningsråd, VERDIKT programmet (Ekstern organisation)
Bødker, S. (Medlem)
7 jun. 2007 → 28 jul. 2007
NordiCHI 2016 (Begivenhed)
Bødker, S. (Redaktør)
1 apr. 2016 → 25 jun. 2016
NordiCHI 2006
Bødker, S. (Foredragsholder)
16 okt. 2006
NordiCHI 2002 (Ekstern organisation)
Bødker, S. (Medlem)
1 okt. 2001 → 1 dec. 2002
Multiple mediation
Bødker, S. (Foredragsholder)
27 jan. 2007
Multiple mediation
Bødker, S. (Deltager)
28 mar. 2007
Mobile HCI
Bødker, S. (Taler)
30 aug. 2011
Medlem af Netværksprogramudvalget (International Network Programme) under FIVU (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2012 → 1 jan. 2016

Lunds Universitet (Ekstern organisation)
Bødker, S. (Medlem)
27 apr. 2007 → 27 maj 2007
Lund Universitet (Ekstern organisation)
Bødker, S. (Medlem)
8 feb. 2006 → 1 mar. 2006
KU (Ekstern organisation)
Bødker, S. (Medlem)
8 feb. 2006 → 1 okt. 2010
KTH (Ekstern organisation)
Bødker, S. (Medlem)
1 aug. 2008 → 1 okt. 2008
KTH (Ekstern organisation)
Bødker, S. (Medlem)
1 aug. 2008 → 1 okt. 2008
Keynote: Rethinking technologies on the boundaries of life and work
Bødker, S. (Foredragsholder)
13 dec. 2016
Keynote: NES 2012: Citizen participation with and through public web services
Bødker, S. (Foredragsholder)
20 aug. 2012
IRIS conference (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 1988 → 1 okt. 1989
International journal of human-computer studies (Tidsskrift)
Bødker, S. (Redaktør)
3 feb. 2004 → ...
Interact 2009 (Ekstern organisation)
Bødker, S. (Medlem)
26 jan. 2009 → 15 jun. 2009
Interact 2009
Bødker, S. (Deltager)
26 aug. 2009 → 28 aug. 2009
Hvorfor har samfundet brug for digital dannelse?
Bødker, S. (Foredragsholder)
13 maj 2013
Helping Users Help Eachother
Bødker, S. (Foredragsholder)
30 sep. 2009
Group 2009 (Ekstern organisation)
Bødker, S. (Medlem)
26 okt. 2008 → 10 jan. 2009
Group 2008 (Ekstern organisation)
Bødker, S. (Medlem)
15 feb. 2008 → 15 maj 2008
Forsknings- og innovationsstyrelsen (Ekstern organisation)
Bødker, S. (Medlem)
1 maj 2014 → 31 dec. 2014
Foredrag: Between initial familiarity and future use – participation and appropriation in artifact ecologies
Bødker, S. (Foredragsholder)
12 maj 2014
Foredrag: Between initial familiarity and future use – participation and appropriation in artifact ecologies
Bødker, S. (Foredragsholder)
25 maj 2014
Foredrag: Between initial familiarity and future use – participation and appropriation in artifact ecologies
Bødker, S. (Foredragsholder)
10 maj 2014
Eusset Summer school
Bødker, S. (Deltager)

22 aug. 2015 → 29 aug. 2015
EUSSET - The European Society of Socially Embedded Technologies (Ekstern organisation)
Bødker, S. (Medlem)
26 okt. 2008 → ...
European Conference on Computer Supported Cooperative Work (Ekstern organisation)
Bødker, S. (Medlem)
27 feb. 2007 → 27 maj 2007
European Conference on Cognitive Ergonomics. ECCE 2011
Bødker, S. (Oplægsholder)
24 aug. 2011
Eurean Science Foundation - PESC (Ekstern organisation)
Bødker, S. (Medlem)
1 sep. 2011 → 31 aug. 2014
ESF Standing Committee for the Physical and Engineering Sciences (Ekstern organisation)
Bødker, S. (Medlem)
1 sep. 2011 → 31 aug. 2014
End-user participation
Bødker, S. (Foredragsholder)
28 sep. 2009
ECSCW 2011, General co-chair (Ekstern organisation)
Bødker, S. (Formand)
1 jan. 2011 → 1 okt. 2011
ECSCW 2011 (Ekstern organisation)
Bødker, S. (Medlem)
2 mar. 2010 → 9 sep. 2011
ECSCW 2009 (Ekstern organisation)
Bødker, S. (Medlem)
26 feb. 2009 → 11 jun. 2009
ECSCW 2009
Bødker, S. (Deltager)
8 sep. 2009 → 11 sep. 2009
ECSCW 2007 (Ekstern organisation)
Bødker, S. (Medlem)
15 feb. 2007 → 1 sep. 2007
ECSCW 2005 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2005 → 1 okt. 2005
ECSCW 2003 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2003 → 1 maj 2003
ECSCW (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 1998 → 1 dec. 1999
Ecological Perspectives in HCI: Promise, Problems, Potentials
Bødker, S. (Arrangør)
4 maj 2015
Doktordisputats, Universitetet i Bergen (Ekstern organisation)
Bødker, S. (Medlem)
1 nov. 2005 → 20 dec. 2005
Doktordisputats, KTH, Stockholm (Ekstern organisation)
Bødker, S. (Medlem)
1 okt. 2005 → 1 nov. 2005
Doktor-bedømmelsesudvalg/opponent (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2013 → 1 maj 2013
Doctoral Consortium ved NordiCHI
Bødker, S. (Deltager)
18 okt. 2008

Doctoral consortium chair ECSCW 2007
Bødker, S. (Arrangør)
15 feb. 2007 → 1 okt. 2007
Doctoral consortium
Bødker, S. (Deltager)
27 jun. 2015
Docentbedømmelse, Chalmers (Ekstern organisation)
Bødker, S. (Medlem)
1 nov. 2007 → 20 dec. 2007
DIS 2008 (Ekstern organisation)
Bødker, S. (Medlem)
15 feb. 2008 → 8 maj 2008
Digitaliseringskonferencen 2011
Bødker, S. (Oplægsholder)
6 apr. 2011
Digitalisering 2011
Bødker, S. (Oplægsholder)
6 apr. 2011
Designing Interactive Systems 2006 (Ekstern organisation)
Bødker, S. (Medlem)
8 feb. 2006 → 12 jul. 2006
Design for multiple interaction
Bødker, S. (Foredragsholder)
7 okt. 2009
Den allestedsnærværende teknologi - hvordan kan vi forstå den bedre og designe derefter
Bødker, S. (Foredragsholder)
4 nov. 2011
Danish-Brazil workshop on Human-Computer Interaction 2
Bødker, S. (Arrangør)
3 sep. 2014 → 5 sep. 2014
Danish-Brazil workshop on Human-Computer Interaction
Bødker, S. (Arrangør)
7 maj 2014 → 9 maj 2014
Critical Computing (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2005 → 1 okt. 2005
Coop2014
Bødker, S. (Deltager)
28 maj 2014 → 30 maj 2014
COOP 2010 (Ekstern organisation)
Bødker, S. (Medlem)
1 okt. 2009 → 15 maj 2010
Coop 2004 (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2004 → 1 maj 2004
COOP program committee 2006 (Ekstern organisation)
Bødker, S. (Medlem)
8 feb. 2006 → 21 mar. 2006
CONVIVIO (Ekstern organisation)
Bødker, S. (Medlem)
3 feb. 2004 → 3 feb. 2007
Conference on Development and use of computer-based systems and tools (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 1984 → 1 sep. 1985
Conference on Communities and Technologies
Bødker, S. (Arrangør)
1 jan. 2015 → 30 maj 2015
Computers in context (Ekstern organisation)

Bødker, S. (Medlem)
1 jan. 1995 → 1 okt. 1995
Citizen participation with and through public web services
Bødker, S. (Foredragsholder)
21 aug. 2012
CHI 2017 (Begivenhed)
Bødker, S. (Fagfællebedømmer)
10 sep. 2016 → 10 dec. 2016
CHI 2010 (Tidsskrift)
Bødker, S. (Redaktør)
1 jan. 2009
CHI 2007 (Tidsskrift)
Bødker, S. (Redaktør)
1 jan. 2006
CHI
Bødker, S. (Taler)
7 maj 2012
CHI
Bødker, S. (Taler)
10 maj 2012
Center for Designforskning (Ekstern organisation)
Bødker, S. (Medlem)
8 feb. 2006 → 1 maj 2006
British HCI conference (Ekstern organisation)
Bødker, S. (Medlem)
15 feb. 2008 → 15 apr. 2008
Bedømmelsesudvalg, Vinnova (Ekstern organisation)
Bødker, S. (Medlem)
1 jun. 2014 → 1 dec. 2014
Bedømmelsesudvalg, lektor Högskolan Kristianstad (Ekstern organisation)
Bødker, S. (Medlem)
2 feb. 2014 → 1 nov. 2014
Bedømmelse af ansøgere til lektorat i Interaktionsdesign, Södertörn Uni. Sverige (Ekstern organisation)
Bødker, S. (Medlem)
1 jan. 2010 → 15 feb. 2010
Activity theoretical HCI
Bødker, S. (Foredragsholder)
5 nov. 2009
ACM (Ekstern organisation)
Bødker, S. (Medlem)
1 mar. 2010 → 1 aug. 2010
ACM (Ekstern organisation)
Bødker, S. (Formand)
28 okt. 2010 → 1 jun. 2012
ACM (Ekstern organisation)
Bødker, S. (Medlem)
28 okt. 2010 → ...
ACM (Ekstern organisation)
Bødker, S. (Medlem)
28 feb. 2010 → 20 aug. 2010
ACM (Ekstern organisation)
Bødker, S. (Medlem)
2 jun. 2010 → 2 aug. 2010
ACM (Ekstern organisation)
Bødker, S. (Medlem)
1 mar. 2010 → 10 aug. 2010
Academy of Finland (Ekstern organisation)
Bødker, S. (Medlem)

16 jan. 2010 → 16 feb. 2010
Aalto University (Ekstern organisation)
Bødker, S. (Medlem)
25 apr. 2014

Undervisning

Since 1983:
1.teaching computer science, human computer interaction and system development at undergraduate and graduate level at University of Aarhus. Since 1998, I have regularly been teaching undergraduate courses for Multimedia education at University of Aarhus.
2.undergraduate introduction to system development/information systems for 5 years (1987-1991), developed and taught graduate courses in system development. Teaching this course again from 2010.
3.introducing and developing graduate and undergraduate courses in Human-Computer Interaction and Computer Supported Cooperative Work:
•From 1998 I have developed and taught an introduction to human-computer interaction for multimedia students together with Olav Bertelsen.
•Such a course has become compulsory to all first-year computer science students as well. I have developed and taught this course for four years (2004-2007).
I have taught together with a number of guests including Wendy Mackay, Horst Oberquelle, Joan Greenbaum, Liam Bannon, Mike Robinson, Ellen Christiansen, Leysia Palen, Leigh Star and Geoff Bowker and with a number of Aarhus colleagues from the Computer Science Department as well as the Department of Information and Media Science.
I participated as student mentor and program committee member of the Siena Design Project 2008, and hosted the Siena Design Project 2010.

Advisor:
40 master theses completed in Computer Science.
5-10 in Multimedia, IT and Organization, Information Science, and diploma theses.
9 PhD theses (main advisor: Jakob Bardram, Christina Nielsen, Marianne Graves Petersen, Ole Sejer Iversen, Gunnar Kramp (Aarhus School of Architecture), Clemens Nylandsted Klokmose, Niels R. Mathiasen, Morten Bohøj, Nikolaj G. Borchorst, Mathias Korn. co-advisor: Preben Mogensen, Olav Bertelsen, Brian Bunch Christensen).
Current PhD students: Anna Maria Polli. I was involved in advising 4 additional PhD students in the Centre for Human-Machine Interaction.
Advisor to several visiting PhD students (From Canada, England, Norway, Finland. Lately, Pär-Ola Zander, Lund, Hans Kyhlbäck, Ronneby, Tanja Svarre, Danmarks Biblioteksskole, Pirjo Näkki, VTT.

Invited lectures, etc. other than major international conferences
Invited lectures at Aalborg University, University of Copenhagen, Danmarks Tekniske Unversitet, universities in Tokyo (Electro-Communications), Hamburg, Bremen, Lund, Stock¬holm (KTH), Turku University/Åbo Akademi Sheffield, Birmingham (Aston), Siena, Stanford, San Diego, Helsinki, Paderborn, Tampere, Ronneby, Vienna, Limerick, at Norsk Regnesentral, Apple Computers, In¬stitute for Research on Learning, Palo Alto and Xerox Palo Alto Research Center.
Invited lectures at seminars and conferences in Milan, 1985, Statens Humanistiske Forskningsråds conference on Qualitative Methods, 1988, Gesellshaft für Informatik workshop on Theorie der Informatik, Burg Bederkesa, October 1989, at track on Com¬puter Supported Cooperative Work, 2nd International Conference on Activity Theory, Lahti, Finland 1990, Oksnøen Symposium 1991 on Knowing and Knowledge: re-speci¬fying the role of formalization, STIMDIS annual meeting, Linköping 1992, 1st conferen¬ce for Socio-Cultural Research, Madrid, Sept. 15-18, 1992, workshop on 'Artefacts and Talk in Collaborative Work Activity', workshop on Social science theory, computer tech¬nology and cooperative working, Paris 1993. Invited panel participant Danish HCI-day 2001. Invited lecturer Jaoo 2002.
PhD courses and doctoral colloquia
PhD courses for the Finnish Research Academy, with Reinhard Keil-Slawik, 1994, and PhD course, Aarhus 1995 with John Bowers, Manchester and John Hughes, Lancaster Universities, with Leigh Star, Illinois, Aarhus 1998 and with the entire senior staff and scientific advisory board of the Center for Human-Machine Interaction, Aarhus, 1998. Peter Bøgh-Andersen and others (BRICS2), Aarhus 2006.
Co-organizer of doctoral colloquia at ECSCW '99, NordiCHI 2000, NordiCHI 2002 and NordiCHI 2004, ECSCW2007, NordiCHI 2008. Danish HCI-day PhD colloquium, 2001. Senior participant doctoral colloquium, Interact 2001, NordiCHI 2008.

Yderligere information

www.cs.au.dk

**Fortegnelse over bedømmelsesudvalg til
stilling 42224 - Associate Professor in Wireless Communication Systems and Networks ved Institut
for Elektroniske Systemer**

Navn: Associate Professor Troels Bundgaard Sørensen
Arbejdssted: Department of Electronic Systems
E-mail: tbs@es.aau.dk

Navn: Associate Professor Henrik Lehrmann Christiansen
Arbejdssted: DTU Fotonic
E-mail: hlch@fotonik.dtu.dk

Navn: Head of Electronic and Computer Engineering Mikael Bergholz Knudsen
Arbejdssted: Ingeniørhøjskolen Aarhus Universitet
E-mail: mbk@ase.au.dk

Akademisk Råd har taget stilling til, at medlemmer af bedømmelsesudvalget er sagkyndige inden for stillingsområdet på et niveau, der mindst svarer til det, der forudsættes for stillingen, dog ikke under lektorniveau.

Associate Professor in Wireless Communication Systems and Networks (42224)

Position No.
42224

At the Technical Faculty of IT and Design, Department of Electronic Systems, Section for Wireless Communication Networks, a position as Associate Professor in Wireless Communication Systems and Networks is open for appointment from July 15th, 2017 or as soon as possible thereafter. The position is for a period of three years.

The Department of Electronic Systems is one of the largest departments at Aalborg University with a total of more than 250 employees. The department is internationally recognized in particular for its contributions within Information and Communication Technology (ICT). The research and teaching of the Department of Electronic Systems focus on electronic engineering and the activity areas are organized in the sections: Antennas, Propagation and Radio Networking section (APNet), Automation Control section (Control), Signal and Information Processing section (SIP), Wireless Communication Networks section (WCN) and Communication, Media and Information technologies (CMI).

The department focuses on maintaining a close interplay with the university's surroundings - locally, nationally and internationally – as well as producing unique basic research and educating talented and creative engineers. The department collaborates with leading ICT researchers all over the world.

Job description
Wireless Communication Networks (WCN) are evolving beyond just supporting best effort broadband services. Driven by connecting Internet of Things (IoT), a range og new technologies to support massive number of low-cost & low-power devices (mMTC) have entered the scene. This includes eMTC and NB-IoT. EC-GSM based cellular technology, as well as LoRa, Sigfox, WiFi, Multefire, Blutetooth, Zigbee operating in ISM bands. Another use case of IoT is real time Cyber Physical Systems, where the connectivity needs to be Ultra Reliable and Low Latency (URLLC). URLLC is required for e.g. wireless connectivity of Industry 4.0 and other mission critical applications.

The research topics of the position include (but are not limited to):

•Research on novel technologies for 5G for improved mMTC and URLLC performance
•Performance assessment and optimization of both massive MTC and URLLC connectivity technologies
•Driving experimental research in WCN living IoT lab, where we target tight collaboration with public and private industry

The position involves:

•Research in the aforementioned areas
•Leading the AAU Living Lab including the further development of new IoT use cases and demonstration tools
•Writing successful applications for research funding
•Development and maintenance of collaboration with project partners, and public and private stakeholders, especially the continuation of research projects with Aalborg Kommune and the North Denmark Region
•Teaching and assessment of students (bachelor, master, PhD)

The position is mainly focused on research, but will also include teaching. The teaching will be within the BSc/MSc study programmes at the School of Information and Communication Technology and the Technical Doctoral School of IT and Design. At Aalborg University, the teaching is based on problem based learning.

The successful candidate should be able to demonstrate research activities within ideally all the aforementioned research areas, and show motivation to advance research activities on future concepts, have experience with deployment research, conducted and live measurements, and development of demonstrators. Finally, the candidate shall be able to coordinate and manage junior researchers working on various aspects of IoT.

You may obtain further professional information from Professor Preben E. Mogensen, phone +45 9940 8818, e-mail pm@es.aau.dk

Qualification requirements:

The level of qualification for Associate Professors shall correspond to the level, which can be achieved on the basis of the appointment as Assistant Professor, but may be achievable in other ways. The appointment presupposes that the applicant can demonstrate original scientific production at an international level as well as documented teaching qualifications.

Appointment to the position requires that both research and teaching qualifications are at the requested level. The two qualifications will be given equal and principal priority in the overall assessment.

The application must contain the following:
• A motivated text wherein the reasons for applying, qualifications in relation to the position, and intentions and visions for the position are stated.
• A current curriculum vitae.
• Copies of relevant diplomas (Master of Science and PhD). On request you could be asked for an official English translation.
• Scientific qualifications. A complete list of publications must be attached with an indication of the works the applicant wishes to be considered. You may attach up to 10 publications.
• Teaching qualifications described in the teaching portfolio. If this is not enclosed the applicant must include an explanation for its absence.
• Dissemination qualifications, including participation on committees or boards, participation in organisations and the like.
• Additional qualifications in relation to the position.
• References/recommendations.
• Personal data.

The applications are only to be submitted online by using the "Apply online" button below.

An assessment committee will assess all candidates.

For further information concerning the application procedure please contact Anne Christoffersen by hr-tech@adm.aau.dk or phone (+45) 9940 9680

Information regarding guidelines, ministerial circular in force, teaching portfolio and procedures can be seen here.

Workplace
Aalborg

Agreement
Employment is in accordance with the Ministerial Order on the Appointment of Academic Staff at Universities (the Appointment Order) and the Ministry of Finance's current Job Structure for Academic Staff at Universities. Employment and salary are in accordance with the collective agreement for state-employed academics.

Deadline
13/05/2017

Apply online

Aalborg University (AAU) conducts teaching and research to the highest level in the fields of humanities, engineering, and natural, health, and social sciences.

top

Resume

Henrik Lehrmann Christiansen
Education: Ph.D., Master of Science, electrical engineering
Expertise: Mobile- and data communications
Key words: Creative, skilled engineer with humour!

Curriculum Vitae

Personal info

Name	**Henrik Lehrmann Christiansen**
Address	Peder Hjorts Vej 11, 4th, 2500 Valby, Denmark
Telephone	+45 24 62 75 27
E-mail-address	hlch@fotonik.dtu.dk
Nationality	Danish
Date of birth	February 26 - 1974
Sex	Male

Core competences and working methods

Primary experience	Telecommunications
Interests and skills	I'm a "polytechnic" with an eager of knowledge, so many areas are of interest to me. Able to work with as well HW, SW, theory and practical implementations. .
Core competences	• Large background- knowledge and professionalism • Ability to gather huge amounts of information and see connections • Ability to explain technical issues in a way that people understand
Working methods	Analytical, quick learner and efficient

Professional experience

Date	**Nov. 2012 – present**
Position	**Associate Professor, DTU Fotonik (www.fotonik.dtu.dk)** I'm part of the Network technologies and service platforms group, which is doing research in infrastructures and technologies for future networks. My main working area is mobile communication and related infrastructures/technologies.
Main activities and areas of responsibilities	• Research: Main research focus: future mobile communication systems. I was heading DTU's effort in the EU project HARP (www.fp7-harp.eu) looking at fronthaul and backhaul infrastructures for future mobile communication systems. • Teaching: Mobile communication and related technologies. Course responsible for the following courses: "Introduction to mobile communication", "Experimental mobile communication", "Mobile backhaul networks". **Teacher of the year**, DTU, 2015 • Head of Study. Responsible for DTU's M.Sc. education in Telecommunication.
Date	**2008 – 2012 (Oct.)**
Position	**Senior RF software engineer, Broadcom (www.broadcom.com)** Broadcom is an American company with approx. 11000 employees worldwide. Broadcom develops chips for all kinds of communication electronics. Broadcom in Denmark develops hardware and software for mobile phones based on Broadcom chips and has approx. 25 employees. Company closed down in Denmark by October 30 – 2012)
Main activities and areas of responsibilities	• Develops embedded software for mobile phones for GSM/UMTS/HSPA. Have developed successful products – on time • Responsible for developing SW for RF calibration and production testing (PC and phone SW). I have hereby improved our development and debugging processes. • Extensive experience with RF measurements and advanced measurement equipment • Cooperate with our customers on debugging customizing our products. Have on

	numerous occasions demonstrated my skills in front of the customer – with great feedback. • Conducts popular internal seminars on various technical topics
Date	**2004 – 2008**
Position	**CTO, CommWyse A/S (www.commwyse.com)** CommWyse A/S develops and sells simulation tools (software) to mobile network operators. Emphasis is on mobile data communication. (GPRS/EDGE, UMTS and HSPA) CommWyse had 6 employees when it filed bankruptcy in 2008. We were 10 employees at the largest.
Main activities and areas of responsibilities	• Company start up – I was in from the very beginning and I was contributing to the company getting investor money and thus could start. Experience in management, legal issues, economics and board work • Daily operations. I made sure the developers knew where to go by defining the right requirements and concepts. I acted as a technical coach for the developers and also participated in the development myself to some extent. • Great product – that we actually sold! I was responsible for preparing strategies and product roadmaps in line with market expectations. • Sales / marketing. Meeting with customers (sales meeting and technical meetings). Writing white papers and representing the company doing presentations and workshops at conferences around the globe.
Date	**2006 – 2012**
Position	**External lecturer in mobile communications, Technical University of Denmark** Teaching at the Photonics DTU department (www.fotonik.dtu.dk)
Main activities and areas of responsibilities	• Planning, administration and teaching the course: *Introduction to mobile communication*. • Teaching mobile network in the course "Home- and access networks". • Supervising Ph.D. and master thesis students
Date	**2003 – 2006**
Position	**Assistant professor, Research Center COM, Technical University of Denmark (www.com.dtu.dk)** Research Center COM (now renamed to Photonics DTU) is doing research and teaching within the field of telecommunications.
Main activities and areas of responsibilities	• Research areas: mobile communications, protocols, computer simulation of communication systems. National and EU projects: METEOR, NGPN, DAVID, BREAD, Broadbandloop • Published papers for international conferences and journals and writing reports for EU research projects (se publication list). Have presented the results around the globe. • Teaching experience – have taught the following university courses: Home- and access networks, modeling and simulation, routing in data networks, advanced protocols, optical networks, introduction to mobile communications. • Have with great success offered and carried out continuing education courses for companies within the topics mobile communications and communications technologies. (among others: TDC and Thrane & Thrane) • Supervised 35+ master theses and Ph.D. students
Date	**2002 – 2003**
Position	**Research assistant, Research Center COM, Technical University of Denmark**
Main activities and areas of responsibilities	Same as under Assistant Professor
Date	**1999-2002**

Stilling	**Ph.D. student, Research Center COM, Technical University of Denmark**
Main activities and areas of responsibilities	Same as under Assistant Professor
	• Courses in IPR and patent legislation, optical networks, and mathematical optimization methods.
Date	**2000 – 2002**
Position	**Consultant , IP Semiconductors A/S**
Main activities and areas of responsibilities	• Hardware development (primarily PCB design)
	• Training of employees (communication technology)
Date	**1995 – 1997**
Position	**Student employee, DEFU**
	DEFU is doing counseling and consultancy within electrical power distribution
Main activities and areas of responsibilities	• Statistical analysis of measurement data
	• Software development (C++)
	• Writing reports for decision makers at power distribution companies

Educational background

Date	**2006**
Education	**Ph.D., Technical University of Denmark**
	Thesis title: *"Heterogeneous network architectures"*
Main study areas and competences	• Main competence: computer simulation of communication systems.
	• Research and teaching within the area of telecommunications
Date	**1999**
Education	**Master of Science, EE, Technical University of Denmark**
	Main area: electrical engineering, specialization: communication
	Thesis title: *"Quality of service in Broadband Access Networks"*
Main study areas and competences	• Telecommunications (systems, protocols, radio communications, optical communication systems)
	• High speed digital electronics
	• Programming and software development

Personal skills and competences

Languages	Danish (Mother's tongue), English (fluent), German (high school level)
Personality	Committed, humorous, fast learner, enterprising, independent, versatile.
International experience	I have studied 6 months at Oregon State University in USA (1998), primarily electrical engineering but I also played in the official university band and took classes in jazz improvisation and rock climbing.
	Experience with international clients and employees. Have done presentations and workshops around the globe. Experience from international conferences and working in European research projects.
Computer skills and competences	Expert level: *OPNET Modeler simulation tool, Microsoft Visual studio, Microsoft Office* Advanced level programming: C / C# / C++. Programming: .NET, Visual basic, Pascal, Fortran, VHDL, PHP, HTML, SQL, perl, assembly language for embedded systems. Version control systems, Linux
Courses and skills upgrading	UMTS design details, ASIC development, Business cases. Basic management. Advanced management – strategy and strategic leadership. Presentation- and sales. Advanced level English, Advanced University pedagogics. In addition short courses in personality, leadership and psychology

Artistic skills and competences	I play 3 instruments at an advanced level. 2 brass instruments (Baritone and euphonium) and jazz piano.
Hobbies and leisure	• On brass instruments I play in 3 bands that are doing concerts, competitions and CD recordings. I have my own home sound studio. • Attends operas and classical and jazz concerts • Chairman and treasurer in boards of various organizations. • Sports; Weight training, running, Pilates and yoga – plus my daily 2 x 15 km by to work • Reading novels and daily Danish newspapers as well as professional magazines in German and English • Have my own electronics work shop
References	Available upon request
Attachment	Publication list

MIKAEL BERGHOLZ KNUDSEN

Udviklingschef
- Ingeniørhøjskolen Aarhus Universitet - Elektronik og computerteknologi
Postaddresse:
Finlandsgade 22
5125, 328
8200
Aarhus N
Danmark
E-mail: mbk@ase.au.dk
Mobil: +4521745355

Career and professional experience

2013: Head of Electronic and Computer Engineering at ASE

2009-2013: Project Manager at Intel Mobile Communication, Denmark.

2005-2009: System architect for RF engines at Infineon Technologies Aalborg, Denmark.

2004-2005: Manager for RF and antenna group at FL-Telecom Aps in Aalborg, Denmark

2004: Associate research professor on 4G mobile phones project at Aalborg University

2001-2004: Project manager and line manager, Maxon Telecom, Denmark

1998-2001: Industrial Ph.D. student at Siemens Mobile Phones in Aalborg, Denmark

1993-1998: R&D engineer, Maxon Cellular Systems A/S in Aalborg, Denmark

1991-1992: Teaching assistant, Aalborg University Centre in Aalborg, Denmark

1989-1990: Biomedical engineer, Siemens A/S in Ballerup, Denmark

1985-1986: Internship, Stibo Datagrafik A/S in Aarhus, Denmark

Educational background

2012: Executive MBA "Master in Management of Technology" from Aalborg University.

2001: Ph.D. titled "Antenna Systems for Handsets" from Aalborg University

1992: M.Sc.E.E from Aalborg University in telecommunications

1989: B.Sc.E.E from Aarhus Teknikum

1985: Svagstrømsteknisk Værkstedsskole from Aarhus Tekniske skole

1984: Studentereksamen, mathematic and physics from Viby Amtsgymnasium

1981: High School Graduation, Mora High School, Minnesota, USA.

Publikationer

1. **2017**
2. Udgivet

   ENERGISING ELECTRONICS ENGINEERING: IMPROVING LEARNING BY FLIPPING THE CLASSROOM AND GOING ONLINE. / Godsk, Mikkel; Hansen, Hans Jørgen; Slavensky, Henning; Lysgaard, Per; Lindhardtsen, Mette Ramsing; Knudsen, Mikael Bergholz.
   INTED2017 Proceedings. 2017. s. 8523-8530 (11th International Technology, Education and Development Conference).
   Publikation: Forskning› Konferencebidrag i proceedings

3. Udgivet

   ENERGISING ELECTRONICS ENGINEERING: IMPROVING LEARNING BY FLIPPING THE CLASSROOM AND GOING ONLINE. / Godsk, Mikkel; Hansen, Hans Jørgen; Knudsen, Mikael Bergholz; Lindhardtsen, Mette Ramsing; Lysgaard, Per; Slavensky, Henning.
   2017. Abstract from INTED 2017, Valencia, Spanien.
   Publikation: Forskning› Konferenceabstrakt til konference

4. **2014**
5. Udgivet

   Antenna Tuning via Multi-Feed Transceiver Architecture. / Alrabadi, Osama N. (Opfinder); Tatomirescu, Alexandru D. (Opfinder); Knudsen, Mikael Bergholz (Opfinder); Pedersen, Gert F. (Opfinder); Pelosi, Mauro (Opfinder); Caporal Del Barrio, Samantha (Opfinder); Olesen, Poul (Opfinder); Bundgaard, Peter (Opfinder).
   Patentnummer: US20140062813 A1;CN103684501A; DE102013108274A1;. mar. 06, 2014.
   Publikation: Forskning› Patent

6. Udgivet

   Antenna system, method and mobile communication device. / Pelosi, Mauro (Opfinder); Tatomirescu, Alexandru D. (Opfinder); Knudsen, Mikael Bergholz (Opfinder); Pedersen, Gert F. (Opfinder); Alrabadi, Osama N. (Opfinder); Caporal Del Barrio, Samantha (Opfinder); Olesen, Poul (Opfinder); Bundgaard, Peter (Opfinder).
   Patentnummer: US20140043201 A1; CN103579778A, DE102013108132A1. feb. 13, 2014.
   Publikation: Forskning› Patent

7. Udgivet

   Probe Selection in Multi-probe OTA Setups. / Fan, Wei; Sun, Fan; Nielsen, Jesper O.; De Lisbona, Xavier Carreno Bautista; Ashta, Jagjit S.; Knudsen, Mikael Bergholz; Pedersen, Gert F.
   I: I E E E Transactions on Antennas and Propagation, 2014.
   Publikation: Forskning - peer review› Tidsskriftartikel

8. **2013**
9. Udgivet

   Channel verification results for the SCME models in a multi-probe based MIMO OTA setup. / Fan, Wei; Carreño, Xavier; Ashta, Jagjit S.; Nielsen, Jesper; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
   IEEE Vehicular Technology Conference. 2013. 6692133.
   Publikation: Forskning - peer review› Konferencebidrag i proceedings

10. Udgivet

    3D channel model emulation in a MIMO OTA setup. / Fan, Wei; Kyösti, Pekka; Sun, Fan; Nielsen, Jesper; Carreño, Xavier; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
    IEEE Vehicular Technology Conference. 2013. 6692020.
    Publikation: Forskning - peer review› Konferencebidrag i proceedings

11. Udgivet

    Antenna pattern impact on MIMO OTA testing. / Fan, Wei; Nielsen, Jesper O.; Franek, Ondrej; Carreño, Xavier; Ashta, Jagjit S.; Knudsen, Mikael Bergholz; Pedersen, Gert F.
    I: I E E E Transactions on Antennas and Propagation, Vol. 61, Nr. 11, 6587285, 25.11.2013, s. 5714-5723.
    Publikation: Forskning - peer review› Tidsskriftartikel

12. Udgivet

    Agile and Adaptive transmitter-Receiver Isolation. / Alrabadi, Osama N. (Opfinder); Tatomirescu, Alexandru D. (Opfinder); Knudsen, Mikael Bergholz (Opfinder); Pedersen, Gert F. (Opfinder); Pelosi, Mauro (Opfinder); Caporal Del Barrio, Samantha (Opfinder); Olesen, Poul (Opfinder); Bundgaard, Peter (Opfinder).
    Patentnummer: US 20130244593 A1, DE102013102799 A1. sep. 19, 2013.
    Publikation: Forskning› Patent

13. Udgivet

    Agile and Adaptive Wideband MIMO Antenna Isolation. / Alrabadi, Osama N. (Opfinder); Tatomirescu, Alexandru D. (Opfinder); Knudsen, Mikael Bergholz (Opfinder); Pedersen, Gert F. (Opfinder); Pelosi, Mauro (Opfinder); Caporal Del Barrio, Samantha (Opfinder); Olesen, Poul (Opfinder); Bundgaard, Peter (Opfinder).
    Patentnummer: US20130244594 A1;CN103326738A, DE102013102799A1;. sep. 19, 2013.
    Publikation: Forskning› Patent

14. Udgivet

    Minimizing Mutual Coupling. / Knudsen, Mikael Bergholz (Opfinder); Adler, Bernd (Opfinder); Bundgaard, Peter (Opfinder); Mueller, Jan-Erik (Opfinder); Pedersen, Gert F. (Opfinder); Pelosi, Mauro (Opfinder).
    Patentnummer: US8521107 B2; US2010304688-A1; DE102010029314-A1; US8170510-B2. aug. 27, 2013.
    Publikation: Forskning› Patent

15. Udgivet

    Impact of system non-idealities on spatial correlation emulation in a multi-probe based MIMO OTA setup. / Fan, Wei; Nielsen, Jesper O.; Carreno, Xavier; Ashta, Jagjit S.; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
    2013 7th European Conference on Antennas and Propagation, EuCAP 2013. 2013. s. 1663-1667 6546559.
    Publikation: Forskning - peer review› Konferencebidrag i proceedings

16. Udgivet

    Test setup for anechoic room based MIMO OTA testing of LTE terminals. / Carreno, Xavier; Fan, Wei; Nielsen, Jesper O.; Ashta, Jagjit Singh; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
    2013 7th European Conference on Antennas and Propagation, EuCAP 2013. 2013. s. 1417-1420 6546511.
    Publikation: Forskning - peer review› Konferencebidrag i proceedings

17. Udgivet

Verification of emulated channels in multi-probe based MIMO OTA testing setup. / Fan, Wei; Carreno, Xavier; Nielsen, Jesper O.; Ashta, Jagjit S.; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
2013 7th European Conference on Antennas and Propagation, EuCAP 2013. 2013. s. 97-101 6546223.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

18. Udgivet

Emulating spatial characteristics of MIMO channels for OTA testing. / Fan, Wei; De Lisbona, Xavier Carreno Bautista; Sun, Fan; Nielsen, Jesper Ødum; Knudsen, Mikael Bergholz; Pedersen, Gert Frolund.
I: I E E E Transactions on Antennas and Propagation, Vol. 61, Nr. 8, 6514488, 07.05.2013, s. 4306-4314.
Publikation: Forskning - peer review› Tidsskriftartikel

19. Udgivet

3: it's the magic number. / Fan, Wei; Sun, Fan; Kyösti, Pekka; Nielsen, Jesper O.; De Lisbona, Xavier Carreno Bautista; Knudsen, Mikael Bergholz; Pedersen, Gert F.
I: Electronics Letters, Vol. 49, Nr. 9, 25.04.2013.
Publikation: Forskning - peer review› Letter

20. Udgivet

3D channel emulation in multi-probe setup. / Fan, W.; Sun, F.; Kyösti, P.; Nielsen, J.; Carreño, X.; Knudsen, Mikael Bergholz; Pedersen, G.
I: Electronics Letters, Vol. 49, Nr. 9, 25.04.2013, s. 623-625.
Publikation: Forskning - peer review› Tidsskriftartikel

21. Udgivet

Breaking the transmitter-receiver isolation barrier in mobile handsets with spatial duplexing. / Alrabadi, Osama N.; Tatomirescu, Alexandru D.; Knudsen, Mikael Bergholz; Pelosi, Mauro; Pedersen, Gert Frolund.
I: I E E E Transactions on Antennas and Propagation, Vol. 61, Nr. 4, 6376102, 16.04.2013, s. 2241-2251.
Publikation: Forskning - peer review› Tidsskriftartikel

22. Udgivet

Wireless Communication Device Antenna with Tuning Elements. / Knudsen, Mikael Bergholz (Opfinder); Adler, Bernd (Opfinder); Bundgaard, Peter (Opfinder); Mueller, Jan-Erik (Opfinder); Pedersen, Gert Frølund (Opfinder); Pelosi, Mauro (Opfinder).
IPC nr.: US2010302123-A1; DE102010029265-A1; US 8405568 B2. mar. 26, 2013.
Publikation: Forskning› Patent

23. Udgivet

Over-The-Air performance optimization and testing of LTE devices. / Knudsen, Mikael Bergholz; Ioffe, Anatoliy; De Lisbona, Xavier Carreno Bautista.
2013.
Publikation: Forskning - peer review› Paper

24. **2012**

25. Udgivet

Automatic fuse architecture. / Knudsen, Mikael Bergholz (Opfinder); Jalili, Feridoon (Opfinder); Wilhelm, Michael (Opfinder); Adler, Bernd (Opfinder).
Patentnummer: US8331889 B2. dec. 04, 2012.
Publikation: Forskning› Patent

26. Udgivet

Impact of probe placement error on MIMO OTA test zone performance. / Fan, Wei; Nielsen, Jesper; Carreño, Xavier; Franek, Ondrej; Knudsen, Mikael Bergholz; Pedersen, Gert F.
LAPC 2012 - 2012 Loughborough Antennas and Propagation Conference. 2012. 6402968.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

27. Udgivet

Measurement verification of plane wave synthesis technique based on multi-probe MIMO-OTA setup. / Fan, Wei; Carreño, Xavier; Nielsen, Jesper O.; Olesen, Kim; Knudsen, Mikael Bergholz; Pedersen, Gert F.
IEEE Vehicular Technology Conference. 2012. 6398925.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

28. Udgivet

MIMO OTA Absolute Data Throughput Concept. / Szini, Istvan; Ioffe, Anatoliy; De Lisbona, Xavier Carreno Bautista; Knudsen, Mikael Bergholz.
2012.
Publikation: Forskning› Paper

29. Udgivet

Simulation and measurement of narrow-band antennas for small terminals. / Pelosi, Mauro; Franek, Ondrej; Knudsen, Mikael Bergholz; Pedersen, Gert F.
IEEE Vehicular Technology Conference. 2012. 6240039.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

30. Udgivet

Impedance Tuning of Transmitting and Receiving Antennas. / Knudsen, Mikael Bergholz (Opfinder); Bundgaard, Peter (Opfinder); Mueller, Jan-Erik (Opfinder); Pedersen, Gert F. (Opfinder).
Patentnummer: US008232925B2 US; DE102010029258-A1; US2010302106-A1. jul. 31, 2014.
Publikation: Forskning› Patent

31. Udgivet

Smart Antenna Front End. / Olesen, Poul; Knudsen, Mikael Bergholz; Bundgaard, Peter.
2012.
Publikation: Forskning - peer review› Paper

32. Udgivet

Radio Frequency Communication Devices and Methods. / Knudsen, Mikael Bergholz (Opfinder); Bundgaard, Peter (Opfinder); Mueller, Jan-Erik (Opfinder).
Patentnummer: US8112043 B2. feb. 07, 2012.

Publikation: Forskning› Patent

33. **Udgivet**

Multiple antenna systems with inherently decoupled radiators. / Pelosi, Mauro; Knudsen, Mikael Bergholz; Pedersen, Gert Frølund.
I: I E E E Transactions on Antennas and Propagation, Vol. 60, Nr. 2 PART 1, 6060886, 01.02.2012, s. 503-515.
Publikation: Forskning - peer review› Tidsskriftartikel

34. **2011**

35. **Udgivet**

Passive component network for antenna isolation in MIMO systems for handheld terminals. / Tatomirescu, Alexandru; Pelosi, Mauro; Knudsen, Mikael Bergholz; Franek, Ondrej; Pedersen, Gert F.
IEEE Vehicular Technology Conference. 2011. 6093117.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

36. **Udgivet**

Port isolation method for MIMO antenna in small terminals for next generation mobile networks. / Tatomirescu, Alexandru; Pelosi, Mauro; Knudsen, Mikael Bergholz; Franek, Ondrej; Pedersen, Gert F.
IEEE Vehicular Technology Conference. 2011. 6093119.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

37. **Udgivet**

Mutual coupling in MIMO antennas with transceiver separation. / Pelosi, Mauro; Knudsen, Mikael Bergholz; Pedersen, Gert F.
Proceedings of the 5th European Conference on Antennas and Propagation, EUCAP 2011. 2011. s. 131-133 5781750.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

38. **Udgivet**

Multiband RF Device. / bagger, oluf (Opfinder); Adler, Bernd (Opfinder); Knudsen, Mikael Bergholz (Opfinder); Wilhelm, Michael (Opfinder).
Patentnummer: US20110117862 A1. maj 19, 2011.
Publikation: Forskning› Patent

39. **Udgivet**

Data transmission method for a communications system like a mobile telephone network transmits data to a subscriber terminal/mobile telephone via an air interface. / Knudsen, Mikael Bergholz (Opfinder).
Patentnummer: DE10243345 B4. feb. 17, 2011.
Publikation: Forskning› Patent

40. **2010**

41. **Udgivet**

Multiple Antenna Systems with High Isolation. / Pelosi, Mauro; Knudsen, Mikael Bergholz; Pedersen, Gert F.
2010.
Publikation: Forskning› Paper

42. **Udgivet**

Narrowband MIMO Antennas with Transceiver Separation. / Pelosi, Mauro; Knudsen, Mikael Bergholz; Pedersen, Gert F.
2010.
Publikation: Forskning› Paper

43. **Udgivet**

A novel paradigm for high isolation in multiple antenna systems with user's influence. / Pelosi, M.; Pedersen, G. F.; Knudsen, Mikael Bergholz.
EuCAP 2010 - The 4th European Conference on Antennas and Propagation. 2010. 5505794.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

44. **Udgivet**

Antenna proximity effects for talk and data modes in mobile phones. / Pelosi, M.; Franek, O.; Knudsen, Mikael Bergholz; Pedersen, G. F.; Andersen, J. B.
I: I E E E Antennas and Propagation Magazine, Vol. 52, Nr. 3, 5586570, 01.06.2010, s. 15-27.
Publikation: Forskning - peer review› Tidsskriftartikel

45. **Udgivet**

Front end for a mobile communication device. / Knudsen, Mikael Bergholz (Opfinder); Pedersen, Gert F. (Opfinder).
Patentnummer: EP2190132-A2; EP2190132-A3; EP1179894-A; EP1179894-A1; EP1179894-B1. feb. 24, 2010.
Publikation: Forskning› Patent

46. **Udgivet**

High-Frequency Prestage and Receiver. / Adler, Bernd (Opfinder); Jalili, Feridoon (Opfinder); Knudsen, Mikael Bergholz (Opfinder); Wilhelm, Michael (Opfinder).
Patentnummer: DE102008049668-A1; US2010081407-A1; US8660512-B2;. feb. 25, 2014.
Publikation: Forskning› Patent

47. **Udgivet**

Transmitting and Receiving Wireless Signals Via Dual Antennas. / Knudsen, Mikael Bergholz (Opfinder); Bundgaard, Peter (Opfinder).
Patentnummer: US2010061279-A1. mar. 11, 2010.
Publikation: Forskning› Patent

48. **Udgivet**

Envelope Correlation and Isolation of Small Terminal Antennas. / Pelosi, Mauro; Franek, Ondrej; Knudsen, Mikael Bergholz; Pedersen, Gert F.
2010.
Publikation: Forskning› Paper

49. **Udgivet**

Systems and Methods for Transmitter/Receiver Diversity. / Knudsen, Mikael Bergholz (Opfinder); Bundgaard, Peter (Opfinder); Adler, Bernd (Opfinder).
Patentnummer: US2010022192-A1; DE102009034241-A1DE102009034241-A1;DE102009034241 B4. mar. 13, 2014.

Publikation: Forskning› Patent

50. 2009

51. Udgivet

Hand phantoms for browsing stance in mobile phones. / Pelosi, Mauro; Franek, Ondřej; Knudsen, Mikael Bergholz; Pedersen, Gert F.
IEEE Antennas and Propagation Society, AP-S International Symposium (Digest). 2009. 5171882.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

52. Udgivet

User's proximity effects in mobile phones. / Pelosi, Mauro; Franek, Ondřej; Knudsen, Mikael Bergholz; Pedersen, Gert F.
European Conference on Antennas and Propagation, EuCAP 2009, Proceedings. 2009. s. 1022-1024 5067789.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

53. Udgivet

User's impact on PIFA antennas in mobile phones. / Pelosi, Mauro; Franek, Ondřej; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
IEEE Vehicular Technology Conference. 2009. 5073899.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

54. Udgivet

A grip study for talk and data modes in mobile phones. / Pelosi, Mauro; Franek, Ondřej; Knudsen, Mikael Bergholz; Christensen, Morten; Pedersen, Gert Frølund.
I: I E E E Transactions on Antennas and Propagation, Vol. 57, Nr. 4 PART. 1, 19.05.2009, s. 856-865.
Publikation: Forskning - peer review› Tidsskriftartikel

55. Udgivet

Influence of Tolerances in Homogeneous Material Properties of Hand Phantoms. / Pelosi, Mauro; Franek, Ondrej; Knudsen, Mikael Bergholz; Pedersen, Gert F.
2009.
Publikation: Forskning› Paper

56. Udgivet

Radio-Frequency Front-end and Receiver. / Wilhelm, Michael (Opfinder); Adler, Bernd (Opfinder); Knudsen, Mikael Bergholz (Opfinder).
Patentnummer: US2009081979-A1. mar. 26, 2009.
Publikation: Forskning› Patent

57. Udgivet

Influence of dielectric loading on PIFA antennas in close proximity to user's body. / Pelosi, M.; Franek, O.; Knudsen, Mikael Bergholz; Pedersen, G. F.
I: Electronics Letters, Vol. 45, Nr. 5, 05.03.2009, s. 246-248.
Publikation: Forskning - peer review› Tidsskriftartikel

58. Udgivet

Efficiency Improvement of PIFA Antennas in Close Proximity with the User's Body with Buffer Dielectric Loading. / Pelosi, Mauro; Franek, Ondrej; Knudsen, Mikael Bergholz; Pedersen, Gert F.
2009.
Publikation: Forskning› Paper

59. 2008

60. Udgivet

User's proximity effects for talk mode in mobile phones. / Pelosi, Mauro; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
2008.
Publikation: Forskning› Paper

61. Udgivet

TRP/TIS Single and Multiple Antenna Terminal Testing. / Knudsen, Mikael Bergholz.
2008.
Publikation: Forskning - peer review› Paper

62. 2007

63. Udgivet

Influence of Human Hand on Mobile Phone Radiation. / Pelosi, Mauro; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
2007.
Publikation: Forskning› Paper

64. Udgivet

Investigation of the hand grip positions of mobile phone users: experimental campaign outline. / Pelosi, Mauro; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
2007.
Publikation: Forskning› Paper

65. Udgivet

Total Efficiency and Impedance Dynamics of Handheld Devices Influenced by Human Hand. / Pelosi, Mauro; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
2007.
Publikation: Forskning› Paper

66. Udgivet

Data communication performing method for communicating data through transceiver using set of antennas, involves selecting antenna with communication quality corresponding to type of data services contained in received signal. / Knudsen, Michael Bergholz (Opfinder); Pedersen, Gert Frølund (Opfinder); Eggers, Patrick Claus F. (Opfinder); CO LTD, SAMSUNG Electronics (Opfinder).
Patentnummer: US2007066361-A1; KR2007026926-A; KR834644-B1;US7643853-B2. jan. 05, 2010.
Publikation: Forskning› Patent

67. Udgivet

Terminal power stabilization apparatus for communication system, has optimal antenna immune to absorption loss due to human body proximity is selected from among multiple antennas connected to single

port. / Eggers, Patrick Claus F. (Opfinder); Pedersen, Gert Frølund (Opfinder); Knudsen, Michael Bergholz (Opfinder); CO LTD, SAMSUNG Electronics (Opfinder).
Patentnummer: US2007111677-A1; KR2007038748-A. aug. 01, 2007.
Publikation: Forskning› Patent

68. 2004
69. Udgivet

Mobile telephone and method for controlling the radiation sent into the body of a user. / Knudsen, Michael Bergholz (Opfinder); Pedersen, Gert Frølund (Opfinder).
Patentnummer: EP1109247-A;EP1109247-A1; EP1109247-B1. maj 06, 2004.
Publikation: Forskning› Patent

70. 2003
71. Udgivet

Simulation of head and hand influence on handset efficiency. / Svendsen, Simon; Christensen, Morten; Pedersen, Gert F.; Knudsen, Mikael Bergholz.
2003.
Publikation: Forskning› Paper

72. 2002
73. Udgivet

Spherical outdoor to indoor power spectrum model at the mobile terminal. / Knudsen, Mikael Bergholz; Pedersen, Gert Frølund.
I: I E E E Journal on Selected Areas in Communications, Vol. 20, Nr. 6, 01.08.2002, s. 1156-1169.
Publikation: Forskning - peer review› Tidsskriftartikel

74. 2001
75. Udgivet

Antenna Systems for handsets. / Knudsen, Mikael Bergholz.
2001.
Publikation: Forskning› Ph.d.-afhandling

76. Udgivet

Handset Performance Test including the Antenna. / Knudsen, Mikael Bergholz.
2001.
Publikation: Forskning› Paper

77. Udgivet

Antenna System, in particular for use in a mobile phone handset, and corresponding control method. / Knudsen, Mikael Bergholz (Opfinder); Vejlgaard, Benny N. (Opfinder); Pedersen, Gert F. (Opfinder).
Patentnummer: EP1091447-A; EP1091447-A1. apr. 11, 2001.
Publikation: Forskning› Patent

78. Udgivet

Antenna systems for EGPRS handsets. / Knudsen, Mikael Bergholz; Brink, S. B.; Pedersen, G. F.
IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, PIMRC. Vol. 1 2001.
Publikation: Forskning - peer review› Konferencebidrag i proceedings

79. Udgivet

Mobile environment. / Knudsen, Mikael Bergholz.
Wireless Flexible Personalised Communications: COST 259: European Co-operation in Mobile Radio Research. Vol. 1 John Wiley & Sons Ltd., 2001. s. 273-277.
Publikation: Forskning - peer review› Bidrag til bog/antologi

80. 2000
81. Udgivet

Investigation of two-branch transmit diversity with two branch receive diversity. / Knudsen, Mikael Bergholz; Vejlgaard, Benny N.; Pedersen, Gert F.
I: I E E E V T S Vehicular Technology Conference. Proceedings, Vol. 5, Nr. 52 ND, 01.12.2000, s. 2486-2490.
Publikation: Forskning - peer review› Tidsskriftartikel

82. Udgivet

Validation of handset antenna test methods. / Knudsen, Mikael Bergholz; Pedersen, Gert F.; Olsson, Bo G H; Olesen, Kim; Larsson, Stig Ake A.
I: I E E E V T S Vehicular Technology Conference. Proceedings, Vol. 4, Nr. 52 ND, 01.12.2000, s. 1669-1676.
Publikation: Forskning - peer review› Tidsskriftartikel

83. Udgivet

Low Complexity Antenna System for Interference Reduction in a GSM Mobile Telephone Handset. / Knudsen, Mikael Bergholz; Brøndum, Johan; Pedersen, Gert F.
I: Wireless Personal Multimedia Communications, 11.2000, s. 315-319.
Publikation: Forskning - peer review› Konferenceartikel

84. Udgivet

3D Radio Environment Measurements at 900 MHz and 2000 MHz. / Knudsen, Mikael Bergholz; Pedersen, Gert F.; Olsson, Bo G H; Olesen, Kim; Larsson, Stig Ake A.
2000.
Publikation: Forskning› Paper

85. Udgivet

Antenna system for interference reduction in a mobile handset. / Knudsen, Mikael Bergholz; Baumgartner, Thomas; Pedersen, Gert F.
I: I E E E V T S Vehicular Technology Conference. Proceedings, Vol. 2, 01.01.2000, s. 1367-1372.
Publikation: Forskning - peer review› Tidsskriftartikel

86. Udgivet

Mobile phone measurement including the antenna. / Knudsen, Mikael Bergholz; Pedersen, Gert F.; Olsson, Bo G H; Olesen, Kim.
I: I E E E V T S Vehicular Technology Conference. Proceedings, Vol. 3, 01.01.2000, s. 2536-2540.
Publikation: Forskning - peer review› Tidsskriftartikel

87. Udgivet

Radiation efficiency of handheld phones. / Pedersen, Gert Frolund; Tartiere, Mathieu; Knudsen, Mikael Bergholz.
I: I E E E V T S Vehicular Technology Conference. Proceedings, Vol. 2, 01.01.2000, s. 1381-1385.
Publikation: Forskning - peer review› Tidsskriftartikel

88. Udgivet

Characterisation of Telia Scattered Field Test Room by use of 3D Radio Environment Measurements. /
Knudsen, Mikael Bergholz; Pedersen, Gert F.; Olsson, Bo G H.
2000.
Publikation: Forskning› Paper

89. **1999**
90. Udgivet

Investigation of SINR gain in micro cellular environment by use of antenna systems in mobile handsets. /
Knudsen, Mikael Bergholz; Faessler, Georg; Pedersen, Gert F.
IEEE VTS 50th Vehicular Technology Conference, VTC 1999-Fall. Vol. 1 1999. s. 627-631.
Publikation: Forskning - peer review› Bidrag til bog/antologi

91. **1992**
92. Udgivet

Duplex diversity switch and power amplifier for DECT. / Knudsen, Mikael Bergholz.
Aalborg University. 1992, .
Publikation: Forskning› Andet bidrag

**Fortegnelse over bedømmelsesudvalg til
stilling Adjunkt i cirkulær økonomi og ecodesign (201712) ved PLAN**

Navn: Lektor Carla Smink
Arbejdssted: PLAN, AAU
E-mail: carla@plan.aau.dk

Navn: Lektor Jesper Holm
Arbejdssted: RUC
E-mail: JH@ruc.dk.

Akademisk Råd har taget stilling til, at medlemmer af bedømmelsesudvalget er sagkyndige inden for stillingsområdet på et niveau, der mindst svarer til det, der forudsættes for stillingen, dog ikke under lektorniveau.

Adjunkt i cirkulær økonomi og ecodesign (201712)

Stillingsnummer
201712

Ved Det Tekniske Fakultet for IT og Design, Institut for Planlægning, Aalborg er 3 årig stilling som Adjunkt i cirkulær økonomi og ecodesign ledig fra 1. Juli 2017 eller snarest derefter.

Institut for Planlægning består af 180 medarbejdere fordelt på 5 sektioner med hver deres sektionsleder og er geografisk spredt med afdelinger i Aalborg og København. Instituttets arbejdsområde omfatter samfundsudvikling og planlægning i bred forstand og spænder således fra de samfundsvidenskabelige sider af samfundsudviklingen (teknologiske, miljø- og energimæssige, internationale og forvaltningsmæssige aspekter), over fysisk planlægning, sektorplanlægning og arealforvaltning til tekniske discipliner som landmåling og kortlægning. Instituttet huser desuden et UNESCO-center for Problem Based Learning in Engineering, Science and Sustainability.

Stillingsbeskrivelse
Ansøgeren vil blive tilknyttet forskningsgruppen Sustainability, Innovations and Polices (SIP) i Aalborg, hvor det forventes at ansøger kan bidrage til forskning og undervisning inden for produkt- og virksomhedsmiljø med udgangspunkt i cirkulær økonomi og ecodesign. Ansøgere, som har forskningsmæssig erfaring inden for cirkulær økonomi og ecodesign er derfor foretrukket. I stillingen skal der primært arbejdes med hvordan man kan skabe cirkulære løsninger både frivilligt gennem samarbejde med virksomheder samt gennem regulering. Det forventes derfor også at kandidaten har viden om relevant miljøregulering. Det forventes ligeledes, at kandidaten har erfaringer med at arbejde i et tværfagligt miljø og kan anvende både kvalitative og kvantitative metoder til at undersøge genstandsfeltet.

Undervisning samt vejledning vil ligge inden for vores bacheloruddannelse i Energi-, Miljø- og Byplanlægning samt vores engelsksproget kandidatuddannelse i Environmental Management and Sustainability Science, men også ved universitetets øvrige uddannelser. Derudover skal kandidaten varetage undervisning samt vejledning i forbindelse med kurset *Problembaseret læring i videnskab, teknologi og samfund*. Et kursusmodul, der kører på tværs af uddannelserne på basisåret på det Tekniske Fakultet for IT og Design samt det Ingeniør- og Naturvidenskabelig Fakultet. Det forventes derfor at kandidaten kan varetage undervisning og vejledning på både dansk og engelsk. Da undervisning på Aalborg universitet er baseret på problembaseret læring, vil erfaringer indenfor denne undervisnings- og vejledningsform være en fordel.

Yderligere faglige oplysninger kan fås ved henvendelse til sektionsleder, Mette Mosgaard, 9940 7209 og mette@plan.aau.dk.

Kvalifikationskrav: Ansættelse som adjunkt forudsætter videnskabelige kvalifikationer som ph.d. eller tilsvarende videnskabelige kvalifikationer. Ved den samlede vurdering af den enkelte ansøger lægges vægt på ansøgerens forskningspotentiale. Den samlede ansættelse som adjunkt kan ikke være på mere end 4 år på Aalborg Universitet i en tidsbegrænset ansættelse (man kan max. være ansat 8 år som adjunkt i Danmark).

Ansøgningen skal indeholde dokumentation for:

- En motiveret tekst, hvori begrundelser for at ansøge, kvalifikationer i forhold til stillingen samt intentioner og visioner for stillingen angives.

- Opdateret curriculum vitae. - Kopier af relevante eksamensbeviser (kandidat og ph.d.)

- Videnskabelige kvalifikationer. Der skal vedhæftes en komplet publikationsliste med angivelse af de arbejder, ansøgerne ønsker at påberåbe sig. Ansøgerne må max. vedhæfter 5 af disse publikationer.

- Undervisningsmæssige kvalifikationer beskrevet i undervisningsportfolio. Såfremt dette ikke er medsendt skal ansøger vedlægge begrundelse herfor.
- Formidlingsmæssige kvalifikationer, herunder deltagelse i udvalg, bestyrelser, foreninger o.l.

- Øvrige kvalifikationer i forhold til stillingen.
- Referencer/anbefalinger.

- Personlige data.

Den samlede ansøgning inkl. bilag kan kun sendes elektronisk ved at vælge nedenstående "søg online" funktion.

Bedømmelse af ansøgere sker ved sagkyndigt udvalg. Såfremt der er spørgsmål til ansøgningsproceduren, kan der rettes henvendelse til Nickie Hermansen, nkh@adm.aau.dk, tlf. (045) 9940 7902. Information vedrørende vejledninger, ansættelsesprocedure samt gældende lovgivning på området kan ses her.

Løn og ansættelsesvilkår
Ansættelse sker i henhold til Ansættelsesbekendtgørelse nr. 242 af 13. marts 2012 samt Finansministeriets gældende Stillingsstruktur for videnskabeligt personale ved universiteter. Ansættelse og aflønning iht. overenskomst for akademikere i Staten.

Arbejdssted
Aalborg

Ansøgningsfrist
17/05/2017

Søg online

Aalborg Universitet (AAU) driver undervisning og forskning til højeste niveau inden for humaniora, samfunds-, ingeniør-, natur- og sundhedsvidenskab.

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CV Associate Professor Jesper Holm, born June 13, 1956

Roskilde University, Dept. People and Technology, Hus 9.2, Box 260, 4000 Roskilde Denmark. Telephone +45 46 742097, e-mail: JH@ruc.dk.

Memberships of international and national concerted action and R&D activities:

- *Conditions for Success in Environmental Policy,* EU´s 4th Environmental research programme, coordinated by Prof. Martin Jänicke, 1993-95.
- *The Ecological State,* EU´s 5th Environmental research programme, 1996-98.
- *Sustainable Communities in Europe,* EU´s 5th Environmental research program, 1998-2001.
- *Center for Environmental Transition,* COMET, the Danish Ministerial Strategic Environmental Research Program, under the CESAM research centre in Århus, 1997-2001.
- *KEMI,* sponsored by Erhvervsfremmestyrelsen, a Business-research Centre contract in co-operation with DHI, DTU and DTC and a number of firms in three manufacturing chains. 2000-2003.
- *Misonet,* a research network sponsored by SSF among Danish environmental sociologists, 2004-2010.
- *The GRO Project: Greening Regional Food Experiences,* an EU Regional Fund R&D Project, 2011-2014, Green Center, Roskilde University, VisitEastDenmark,

Jesper Holm project leader for

- *Sustainable Inclusion through Community Formation,* sponsored by Region Zealand Dept. of Social Affairs, 2015-2016
- *Health Promotion in Institutional settings,* sponsored by VækstForum Sjælland and the Tryg Fund, 2011-2014
- *Ecological Experience Innovation,* an R&D project for local tourism development in Zealand, DK. Financed by Region Sjælland, 2011-2012.
- *Den Lærerige Miljøoplevelse* [Eco-learning Experience] sponsored by VækstForum Sjælland, an R&D program in registration, enhancing and promoting learning experiences on ecological destinations in Denmark. 2009-2012 .
- *KIBS, Klimaorienteret Byggeri I Region Sjælland,*[Climate-oriented Construction Governance in Zealand] sponsored by Vækst Forum Sjælland, 2009-2014, a R &D program in analyzing, transition strategies in environmental construction and housing politics.
- *Environmental Innovation,* EU Climate and Environment research project: *ENVINNO,*1998-2001.

Current Research

- Greening in ecological tourism - http://regionalemadoplevelser.dk, http://www.greeninsight.dk
- Environmental Health Promotion Policies and Strategies
- Health Promotion in Institutional Settings for Functionally Disabled Citizens http://www.ruc.dk/forskning/forskningscentre/csuf/forskning/sph/ http://www.bæredygtiginklusion.dk
- Local Agenda 21, deliberation, experimentation for health and environment.
- Environmental Transition and Socio-Technological systems. Theory and cases.
- Sustainable Construction and Housing: Innovation studies in the construction sector, local sustainable transition efforts in Danish municipalities - http://www.klimabyggeri.dk

Publications - http://rucforsk.ruc.dk/site/person/jh

Jesper Holm

Lektor

1 - 10 ud af 109   **Sortering:** Udgivelsesdato

2016

Post Rio and Ottawa Policy : Health Promotion and Sustainable Development Compared . / Almlund, Pernille; Holm, Jesper.
I: The Journal of Transdisciplinary Environmental Studies, Vol. 14, Nr. 2, 01.02.2016, s. 19-35.
Forskning - peer review › Tidsskriftartikel

Udgivet

Bæredygtig Inklusion : review af praksiserfaringer i Skandinavien. / Fabricius Østerby, Anne Sofie ; Holm, Jesper; Olesen, Birgitte Ravn; Sorensen, Henrik.
Roskilde : Roskilde Universitet, 2016. 120 s.
Forskning - peer review › Rapport

Udgivet

Situated Health Knowledge: Translation and Transferal between Institutional Settings. / From, Ditte-Marie; Holm, Jesper; Sørensen, Henrik; Kristensen, Kasper Andreas.
I: Scandinavian Journal of Public Health, 2016.
Forskning › Tidsskriftartikel

Under udarbejdelse

2015

Bæredygtig inklusion gennem community dannelse : Marjatta - fællesskaber og inklusion. / From, Ditte-Marie; Holm, Jesper; Olesen, Birgitte Ravn; Sørensen, Henrik; Øvre Sørensen, Nelli.
Roskilde : Roskilde Universitet, 2015. 66 s.
Forskning - peer review › Rapport

Udgivet

Bæredygtig inklusion gennem community dannelse : Østagergaard - fællesskaber og inklusion. / From, Ditte-Marie; Holm, Jesper; Olesen, Birgitte Ravn; Sørensen, Henrik; Øvre Sørensen, Nelli.
Roskilde : Roskilde Universitet, 2015. 68 s.
Forskning - peer review › Rapport

Udgivet

Post Rio Communication Styles for Deliberation : between individualization and collective action. / Holm, Jesper; Almlund, Pernille.
Communication for the Commons. Revisiting Participation and Environment: Proceedings of the 2013 Conference on Communication and Environment. red. / Mark S. Meisner; Nadarajah Sriskandarejah; Stephen P. Depoe. Turtle Island : The International Environmental Communication Association, 2015.
Forskning - peer review › Konferencebidrag i proceedings

Udgivet

Introduction. / Holm, Jesper; Jensen, Jesper Ole; Søndergård, Bent; Stauning, Inger.
Sustainable Transition of Housing and Construction. red. / Jesper Holm; Bent Søndergaard; Inger Stauning; jesper Ole jensen. Frydenlund Academic, 2015. s. 11-34.
Forskning - peer review › Bidrag til bog/antologi

Udgivet

Technology Paths in Energy-Efficient and Sustainable Construction. / Holm, Jesper; Lund Sørensen, Runa Cecilie.
Sustainable Transition of Housing and Construction. red. / Jesper Holm; Bent Søndergaard; Inger Stauning; Jesper Ole Jensen. 1. e-bogsudgave. udg. Frydenlund Academic, 2015. s. 99-130.
Forskning - peer review › Bidrag til bog/antologi

Udgivet

The Role of Local Governments in Climate Transition in Housing and Construction. / Holm, Jesper; Søndergård, Bent; Stauning, Inger.
Sustainable Transition of Housing and Construction. red. / Jesper Holm; Bent Søndergaard; Inger Stauning; Jesper Ole Jensen. Copenhagen : Frydenlund Academic, 2015. s. 283-326.
Forskning - peer review › Bidrag til bog/antologi

Udgivet

Transition Theory – Sustainable Transition of Socio-Technical Systems. / Sondergård, Bent; Holm, Jesper; Stauning, Inger.
Sustainable Transition of Housing and Construction. red. / Jesper Holm; Bent Søndergaard; Inger Stauning; Jesper Ole Jensen. e-bog. udg. Frederiksberg : Frydenlund Academic, 2015. s. 37-68.

Udgivet

**Fortegnelse over bedømmelsesudvalg til
stilling 201713 Assistant professor in Computer Vision and Computer Graphics ved Department of
Architecture Design and Media Technology**

Navn: Associate Professor Georgios Triantafyllidis
Arbejdssted: Department of Architecture Design and Media Technology
E-mail: gt@create.aau.dk

Navn: Professor Angel Domingo Sappa
Arbejdssted: Computer Vision Center (CVC)
E-mail: angel.sappa@cvc.uab.es

Akademisk Råd har taget stilling til, at medlemmer af bedømmelsesudvalget er sagkyndige inden for stillingsområdet på et niveau, der mindst svarer til det, der forudsættes for stillingen, dog ikke under lektorniveau.

Assistant professor in Computer Vision and Computer Graphics

Position No.
201713

At the Technical Faculty of IT and Design, Department of Architecture, Design and Media Technology, Aalborg University Copenhagen a new Assistant Professor position in Computer Vision and Computer Graphics is available for appointment for a 3 year period from August 1 2017 or soon thereafter and with the possibility of an extension of the position for a fourth year.

The Department of Architecture, Design and Media Technology has as its goal the development of an innovative cluster of engineering-based environments for education and research which integrate creativity, engineering and technology within the disciplines of architecture, urban design, industrial design, digital design and interactive media. The department is a leading research and educational environment in Denmark that addresses the challenge of the interplay between creativity and technology, and develops new areas in research and education directed towards the end-user.

Job description
This position has its primary research and teaching areas in the general field of Media Technology, and specifically in Computer Vision and Computer Graphics. Applicants should have expertise in computer graphics programming, intelligent visual systems, computer vision, including programmable functionalities of GPUs, graphics APIs such as OpenGL, and mathematical models applied in GPU based shader programs.

Applicants are also welcomed with additional competences and experience in game and interactive systems; development and technical knowledge of 3D real-time game engines such as Unity, Unreal and CryEngine; motion capture; and modeling/animation/rendering tools such as Maya, MotionBuilder and Blender.

Applicants should document international academic activity, including teaching publication and experience in research project funding applications, collaboration and management. The applicant is also expected to demonstrate a relevant publication record and teaching experience.

Teaching will primarily consist of courses in computer graphics programming as well as supervision of project work in the following three educations: a) "Medialogy" (B.Sc.), b) "Medialogy" (M.Sc.) and c) "Lighting Design" (M.Sc.) which are all taught in English.

You may obtain further professional information from Associate professor Georgios Triantafyllidis, phone +45 9940 2622, email: gt@create.aau.dk

Qualification requirements:

Appointment as an Assistant Professor presupposes scientific qualifications at PhD–level or similar scientific qualifications. The research potential of each applicant will be emphasized in the overall assessment.

Appointment as an Assistant Professor cannot exceed a period of four years in total in a temporary position (appointment at Assistant Professor level cannot exceed a period of eight years in total in Denmark).

The application must contain the following:

- A statement outlining your reasons for applying, and intentions and visions with, the position.
- Your curriculum vitae, including personal data, educational background, scientific qualifications, dissemination skills, participation in committees and boards, and additional qualifications relevant for the position.
- Copies of relevant diplomas (Master of Science and PhD). On request you could be asked for an official English translation.
- A complete list of publications.

- Publications you wish to be considered by the assessment committee. You may attach up to 5 publications.
- A specification of your teaching qualifications relative to the teaching portfolio. If this is not enclosed you must include an explanation for its absence.
- References/recommendations.

An assessment committee will assess all candidates.

The applications are only to be submitted online by using the "Apply online" button below.

For further information concerning the application procedure please contact Anne Christoffersen by mail ach@adm.aau.dk or phone (+45) 9940 9680.

Information regarding guidelines, ministerial circular in force, teaching portfolio and procedures can be seen here.

Workplace
Copenhagen

Agreement
Employment is in accordance with the Ministerial Order on the Appointment of Academic Staff at Universities (the Appointment Order) and the Ministry of Finance's current Job Structure for Academic Staff at Universities. Employment and salary are in accordance with the collective agreement for state-employed academics.

Deadline
02/06/2017

Apply online

Aalborg University (AAU) conducts teaching and research to the highest level in the fields of humanities, engineering, and natural, health, and social sciences.

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Curriculum vitae

Name: Angel Domingo SAPPA

Date: April 26th. 2017

Present Professional Position

Institution: Computer Vision Center (CVC)
Address: Edifici O Campus UAB, 08193 Bellaterra,
Barcelona   Country: Spain
Telephone: +34 93 581 4905   Fax: +34 93 581 1670
e-mail: angel.sappa@cvc.uab.es   http://www.cvc.uab.es/~asappa
Professional status: Senior Research Scientist   Start date: September 2003

Institution: Escuela Superior Politécnica del Litoral (ESPOL)
Address: Campus Gustavo Galindo, CIDIS, Edificio 37, planta baja (Área de Tecnología),
Guayaquil   Country: Ecuador
Telephone: +593 370 8412   e-mail: asappa@espol.edu.ec
Professional status: Full Professor (PhD Program Cooridnator)   Start date: August 2016

Research Interest

Machine learning; Computer vision; Multispectral imaging; Autonomous systems; 3D computer vision and geometric modelling (range images, stereoscopic images); 3D object recognition.

Academic Background

- PhD. in Engineering (*Advanced Automation and Robotics*), Institute of Organization and Control of Industrial Systems (former Institute of Cybernetics), Polytechnic University of Catalonia, Barcelona, Spain, November 1999. Thesis entitled: "Automatic Generation of 3D Geometric Models from Range Images". Thesis Supervisor: Dr. Miguel Angel Garcia.

- Electro-Mechanical Engineer with a specialty in Industrial Automation, May 1995, Faculty of Engineering, National University of La Pampa, Argentina. Officially recognized by the Spanish Education and Culture Ministry under the Spanish title: Industrial Engineer (specialty in Electrical Engineering), November 1997.

Past Scientific Experience

Position	R&D Center	Start date	End date
Associate Researcher (Ramón y Cajal Research Fellowship)	Computer Vision Center	01-09-2003	31-08-2008
Associate Researcher (Marie Curie Research Fellowship)	ITI-CERTH (Informatics & Telematics Institute - Centre for Research and Technology, Hellas), Thessaloniki, Greece	01-09-2002	31-08-2003
Post-Doctorate	Z+F UK Ltd. (former RTS Advanced Robotics Ltd.), Manchester, United Kingdom	01-03-2001	31-08-2002
Post-Doctorate	LAAS-CNRS (Laboratory of Analysis and Architecture of Systems - Robotics and Artificial Intelligence team, National Center for Scientific Research), Toulouse, France	01-11-1999	28-02-2001

Languages

Language	Level
Spanish	Mother tongue
English	Certificate in Advanced English, University of Cambridge, United Kingdom
French	Certificate in Intermediate Level, Alliance Française, Toulouse, France
Catalan	Certificate in Basic Level, Polytechnic University of Catalonia, Barcelona, Spain

Participation in Research Projects

1. Per-4-Man: Ubicuous multimodal PERception for a smart traffic MANagement. ERANet-LAC: Latin America, Caribbean and European Union (Ref. ELAC2015/T10-0717). Project Coordinator: **A. D. Sappa**; Principal Investigator (ESPOL): **A. D. Sappa**, Guayaquil, Ecuador (**535.194 €**). *(under evaluation)*

2. DLAVYR: Red Temática Iberoamericana sobre *Deep Learning* y sus Aplicaciones en Visión y Robótica. CYTED, Investigación: Convocatoria 2016 (Ref. P516RT0067). Principal Investigator: **A. D. Sappa**, Escuela Superior Politécnica del Litoral, Guayquil, Ecuador (**25.000 €**).*(under evaluation)*

3. Pattern recognition: case study on agriculture and aquaculture. ESPOL (Ref. M1-D1-2015). September 2015-September 2017. Principal Investigator: D. Romero, Escuela Superior Politécnica del Litoral, Guayquil, Ecuador (**39.400 U$S**).

4. FireDMMI: Fire Detection and Monitoring using Multispectral Imaging. Spanish Ministry of Science and Innovation (Ref. TIN2014-56919-C3-2-R). January 2015-December 2017. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**82.643 €**).

5. SiMeVé: Sistema Multiespectral de Visión Estéreo (Multispectral Stereo Vision System). Spanish Ministry of Science and Innovation (Ref. TIN2011-25606). January 2012-December 2014. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**49.368 €**).

6. MIPRCV: Multimodal Interaction in Pattern Recognition and Computer Vision. Spanish Ministry of Education and Science, CONSOLIDER-INGENIO 2010 (Ref. MIPRCV CSD2007-00018). October 2007-October 2012. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**648.000 €**).

7. ViDAS-Road: Vision-based Driver Assistance Systems for Road Safety. Spanish Ministry of Science and Innovation (Ref. TRA2010-21371-C03-01). January 2011-January 2012. Principal Investigator: A. López, Computer Vision Center, Barcelona, Spain (**14.520 €**).

8. 3DREAMDIP: 3D Real-time Modeling on a Distributed Platform. Spanish Ministry of Science and Innovation (Ref. TIN2010-10163-E (subprograma TIN)). July 2010- July 2011. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**2.000 €**).

9. OnViSuPRA, On-board Video Surveillance Platform for Railway Applications. Catalan Agency for Management of University and Research Grants (AGAUR) (Program: "Comunitat de Treball dels Pirineus (ITT-CTP)") (Ref. 2008ITT00001 ITT-CTP08). January 2009-December 2010. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**29.000 €**).

10. IMPACT: Image Processing With Smart CMOS imager preprocessing and hardware computing platform. Spanish Ministry of Science and Innovation (Ref. MAT2008-03060-E/MAT). July 2007-June 2009. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**3.000 €**).

11. CHIRE: Cognitive Human Interfaces for Real Environments. Spanish Ministry of Science and Innovation. (Ref. TN2008-03016-E/TIN). January 2008-December 2008. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**1.500 €**).

12. Sistema de iluminación y adquisición de imágenes para el control de calidad sin contacto de sobres con material quirúrgico. Spanish Ministry of Education and Science (Ref. PET2006−0744). December 2007-December 2008. Principal Investigator: A. López, Computer Vision Center, Barcelona, Spain (**54.053 €**).

13. Computer vision based detection and tracking of vehicles and pedestrians for ADAS. Spanish Ministry of Education and Science (Ref. TRA2007-62526/AUT). January 2008-December 2010. Principal Investigator: A. López, Computer Vision Center, Barcelona, Spain (**188.760 €**).

14. I-ADAS: Intelligent Architecture for Driver Assistance Systems. Spanish Ministry of Education and Science (Ref. TRA2007-30397-E/AUT). January 2007-December 2007. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**2.000 €**).

15. RAViCC: Red Argentina en Visión y Cognición Computacional. Argentinean Secretary of Science, Technology and Productive Innovation, International Relationship Office, RAICES Program. October 2007-October 2009. Principal Investigator (CVC): **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (Coordinator Marta E. Mejail, Computer Science Department, Buenos Aires University, Argentina)(**20.000 $ Arg.**).

16. Procesamiento de la Señal Audiovisual en Interfaces Multimodales Avanzados. Spanish Ministry of Education and Science (Ref. TIN2006-26901-E/). October 2006 -September 2008. Principal Investigator: Nicolás Perez de la Blanca Capilla, Unviersidad de Granada, Granada, Spain.

17. Computer vision detection and tracking of vehicles and pedestrians. Validation with an intelligent vehicle prototype. Spanish Ministry of Education and Science (Ref. TRA2004-06702/AUT). January 2005-December 2007. Principal Investigator: A. López, Computer Vision Center, Barcelona, Spain (**143.000 €**).

18. ATTEST (Advanced Three-Dimensional Television System Technologies). European Commission (Information Society Technologies IST-2001-34396). March 2002-March 2004. Principal Investigator: Michael G. Strintzis, Thessaloniki, Greece. (**418.297 €**).

19. CAMERA (Cad Modelling of Built Environments from Range Analysis). European Commission (Trans-Mobility of Researchers - ERB FMRX-CT97-0127). January 1998-December 2001. Principal Investigator: Michel Devy, Toulouse, France.

20. Automatic Programming and Execution of Robotics Tasks of Polishing and Finishing of Pieces. CICYT (Ref. TAP96-0868). September 1996-July 1999. Principal Investigator: L. Basañez, Polytechnic University of Catalonia, Barcelona, Spain.

21. SISPER: Modular and Re-configurable Perception System for Robotics. CYTED (Cod. 042/VII. 14). September 1997-July 1999. Principal Investigator: L. Basañez, Polytechnic University of Catalonia, Barcelona, Spain.

Fellowships

1. **PROMETEO Project Fellowship**: "Visión por Computador: (i) docencia en grado y postgrado; (ii) investigación básica y aplicada en sistemas de visión multiespectrales". Secretary of Higher Education, Science, Technology and Innovation, Ecuador (Ref. 2014-030). February 2015-February 2016. Escuela Superior Politécnica del Litoral, ESPOL, Guayaquil, Ecuador (**84.997,79 U$S**).

2. **PROMETEO Project Fellowship**: "Visión por Computador: (i) docencia en grado y postgrado; (ii) investigación básica y aplicada en sistemas de visión multiespectrales". Secretary of Higher Education, Science, Technology and Innovation, Ecuador (Ref. 2013-004). July 2013-September 2013 and December 2013-February 2014. Escuela Superior Politécnica del Litoral, ESPOL, Guayaquil, Ecuador (**51.380 U$S**).

3. **ASI Students Fellowship**: "Croucher Advanced Study Institute on Biometric Authentication 2004". The Croucher Foundation (Ref. ASI 04). December 5-12 2004. Hong Knog Baptist University, Hong Kong (**3000 HK$**).

4. **Ramón y Cajal Fellowship**: "3D digital model generation by using information provided by different computer vision systems". Spanish Ministry of Science and Technology (Ref. MEC RYC-2002- 002473, Ramón y Cajal porgram). September 2003-August 2008. Computer Vision Center, Barcelona, Spain (**161.248 €**).

5. **Marie Curie Fellowship**: "3D Image Representation for Three-Dimensional Television System Technologies". European Commission, Research & Innovation (Ref. HPMD-CT-2001-00086). September 2002-August 2003. Informatics & Telematics Institute - Centre for Research and Technology, Hellas (ITI-CERTH), Thessaloniki, Greece (**43.200 €**).

6. **Trans-Mobility of Researchers Fellowship**: "CAD Models from Range Analysis". European Commission, Research & Innovation (Ref. ERB FMRX-CT97-0127). November 1999-December 2001. Laboratory of Analysis and Architecture of Systems - Robotics and Artificial Intelligence team, National Center for Scientific Research (LAAS-CNRS), Toulouse, France and Z+F UK Ltd. (former RTS Advanced Robotics Ltd.), Manchester, United Kingdom.

7. **Mutis Pre-doctoral scholarship**: "Automatic Generation of 3D Geometric Models from Range Images". Agencia Española de Cooperación Internacional (Ref. 72-"Programa Mutis"). October 1995-April 1999. Institute of Organization and Control of Industrial Systems (former Institute of Cybernetics), Polytechnic University of Catalonia, Barcelona, Spain (**5.460.000 Pesetas**).

8. **Intercampus scholarship**: "Programa Intercampus del Instituto de Cooperación Iberoamericana". January-February 1995. Dpto. Automática, Electricidad y Electrónica Inudstrial, Universidad de Murcia, Cartagena, Spain.

Participation in Research Contracts with Private Companies

1. Human Body Size Estimation for Tailoring. Tailor4Less, March 2011-June 2011. Principal Investigator: X. Roca, Computer Vision Center, Barcelona, Spain (**17.500 €**).

2. Anthropometric Measurements (III). Sizemenow S.L., January 2010-June 2010. Principal Investigator: F. Lumbreras, Computer Vision Center, Barcelona, Spain (**7.396 €**).

3. Anthropometric Measurements (I). Sizemenow S.L., July 2009-December 2009. Principal Investigator: **A. D. Sappa**, Computer Vision Center, Barcelona, Spain (**6.175 €**).

4. Vehicle detection at night time for adapted head light control (II). Volkswagen AG. March 2006-December 2006. Principal Investigator: A. López, Computer Vision Center, Barcelona, Spain (**67.317 €**).

5. Vehicle detection at night time for adapted head light control (I). Volkswagen AG. March 2005-December 2005. Principal Investigator: A. López, Computer Vision Center, Barcelona, Spain (**59.600 €**).

6. Night Vehicle Detection and Tracking. SEAT CT y Volkswagen AG. February 2004-June 2004. Principal Investigator: A. López, Computer Vision Center, Barcelona, Spain (**43.900 €**).

7. Munitions Recognition System. Defence Science and Technology Laboratory, an agency of the UK Ministry of Defence. January 2001-December 2002. Principal Investigator: G. Dalton, Z+F UK Ltd., Manchester, England.

Teaching Activities

- **May 2016-September 2016**: Preparation and teaching of the course: "Introduction to Industrial Robotcis", Facultad de Ingeniería en Electricidad y Computación, Escuela Superior Politécnica del Litoral (ESPOL), Guayaquil, Ecuador.

- **May 2016-September 2016**: Preparation and teaching of different lectures for the course: "Theory and Application of Computer Vision", MSc and PhD programs in Applied Computer Science, Facultad de Ingeniería en Electricidad y Computación, Escuela Superior Politécnica del Litoral (ESPOL), Guayaquil, Ecuador.

- **October 2015-February 2016**: Preparation and teaching of different lectures for the course: "Introduction to Computer Vision", MSc and PhD programs in Applied Computer Science, Facultad de Ingeniería en Electricidad y Computación, Escuela Superior Politécnica del Litoral (ESPOL), Guayaquil, Ecuador.

- **July-August 2013**: Preparation and teaching of a final year course entitled: "Multispectral Vision Systems, Basic Concepts and Applications", Facultad de Ingeniería en Electricidad y Computación, Escuela Superior Politécnica del Litoral (ESPOL), Guayaquil, Ecuador.

- **Winter 2008/2009/2010/2011/2012**: Preparation and teaching of two Master courses entitled: 1) "Extracting 3D Information: Introduction" and 2) "3D Object Representation", Master in Computer Vision and Artificial Intelligence, Autonomous University of Barcelona, Spain.

- **2003 – 2005**: Preparation and teaching of practices related to a course entitled "Artificial Intelligence I", Department of Computer Science, Autonomous University of Barcelona, Spain. These practices address the following topics: Lisp language, unsupervised classification, un- informed search algorithms, informed (heuristic) search algorithms, A* algorithm, adversarial search algorithms, minimax/alpha-beta algorithm for the Othello game. Duration: 70 hours. Undergraduate students: on average 165 students per year; course of the fourth year BSc degree in computer science.

- **Autumn 1998**: Preparation and teaching of a Master course entitled "Range images processing and representation", Master in Automatic Control and Robotics, Polytechnic University of Catalonia, Barcelona, Spain.

- **1995-2001**: Assistant Professor "Automatic Control II", Faculty of Engineering, National University of La Pampa, La Pampa, Argentina.

- **1992-1993**: Teaching's Assistant "Analisis Matemático y Métodos Numéricos", Faculty of Engineering, National University of La Pampa, La Pampa, Argentina.

Supervision Activities

- **2015 – present**: Supervision of a **Ph.D student** (Xavier Soria Poma), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Cross-spectral image fusion, segmentation and understanding.

- **2015 – present**: Co-supervision of a **Ph.D student** (Jordi Salvador), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Processing, representation and analysis of cross-spectral images.

- **2015 – present**: Co-supervision of a **Ph.D student** (Patricia Suarez), Facultad de Ingeniería en Electricidad y Computación, Escuela Superior Politécnica del Litoral (ESPOL), Guayaquil, Ecuador. Subject: Multispectral imaging.

- **2013 – present**: Co-supervision of a **Ph.D student** (Cristhian A. Aguilera-Carrasco), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Cross-spectral stereo.

- **2012 – 2013**: Supervision of a **final year student** (Marcelo Pistarelli), Universidad de Rosario, Argentina. Subject: Cross-spectral feature detection and matching.

- **2012 – 2013**: Supervision of a **final year student** (Gioacchino Vino), Leonardo Da Vinci programme. Control Systems Engineering Department. Technical University of Bari (Politecnico Di Bari), Bari, Italy. Subject: Multispectral image descriptor.

- **2012 – 2013**: Co-supervision of a **Master student** (Jordi Salvador), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Towards multi-modal 3D reconstruction from UAV aerial images.

- **2011 – 2012 (six months)**: Supervision of a **Ph.D** (Dr. Cristhian Aguilera), Computer Science Department, Universidad del Bio-Bio, Concepción, Chile. Subject: Multispectral feature extraction.

- **2011 – present**: Co-supervision of a **Ph.D student** (Germán Ros Sanchez), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: constrained SLAM formulation for ADAS applications.

- **2011 (six months)**: Supervision of a **Ph.D** (Dr. Carme Julià), Intelligent Robotics and Computer Vision Group, Department of Computer Science and Mathematics, Universitat Rovira i Virgili, Tarragona, Spain. Subject: Multispectral SFM.

- **2009 – 2014**: Co-supervision of a **Ph.D student** (Monica Piñol Naranjo), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: reinforcement learning based image descriptors. **Mark: Outstanding *Excel.lent***

- **2010 – 2013**: Co-supervision of a **Ph.D student** (Miguel Oliveira), Department of Mechanical Engineering, Aveiro University, Portugal. Subject: on-board image registration and fusion. **Mark: Outstanding *Cum Laude***

- **2009 – 2013**: Supervision of a **Ph.D student** (Naveen Onkarappa), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Optical Flow in Driver Assistance Systems. **Mark: Outstanding *Cum Laude***

- **2008 – 2012**: Co-supervision of a **Ph.D student** (Fernando Barrera), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Multimodal Stereo from Thermal Infrared and Visible Spectrum. **Mark: Outstanding *Cum Laude***

- **2008 – 2012**: Supervision of a **Ph.D student** (Mohammad Rouhani), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Shape Representation and Registration using Implicit Functions. **Mark: Outstanding *Cum Laude***

- **2004 – 2008**: Co-supervision of a **Ph.D student** (Carme Julià), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: Factorization with Missing Data Addressing the Structure from Motion Problem. **Mark: Outstanding *Cum Laude* (Second Prize to best Spanish PhD Thesis**, AERFAI, June 2009)

- **2008 – 2009**: Supervision of a **Master student** (Luca Gallo), Erasmus Student Placement programme. Control Systems Engineering Department. Technical University of Bari (Politecnico Di Bari), Bari, Italy. Subject: acquisition, processing and visualization of 3D data from a stereo rig. **Mark: Outstanding *Cum Laude***

- **2007**: Supervision of a **final year student** (Rosa Herrero), Mathematics Department, Autonomous University of Barcelona, Spain. Subject: road approximation in Euclidean and v-disparity space: a comparative study.

- **2007**: Supervision of a **final year student** (Christian Vintimilla), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: automatic generation of 3D articulated models from stereo images.

- **2006 (three months)**: Supervision of a **Ph.D** (Dr. Boris Xavier Vintimilla Burgos), Escuela Superior Politécnica del Litoral, Guayaquil, Ecuador. Subject: geometrical and topological based feature extraction.

- **2006**: Co-supervision of a **final year student** (Ramon Suñé), Computer Science Department, Autonomous University of Barcelona, Spain. Subject: graphical interface for 3D face extraction using stereo vision.

- **2004 – 2005**: Co-supervision of a **Master student** (Hugo Berti), Electrical and Computer Engineering Department, National University of South, Bahía Blanca, Buenos Aires, Argentina. Subject: automatic navigation of mobile robots. **Mark: 10 / 10 (Outstanding)**

- **2002 – 2003**: Co-supervision of a **Ph.D student** (Niki Aifanti), Informatics & Telematics Institute - Centre for Research and Technology, Hellas, Thessaloniki, Greece. Subject: vision based human body modelling.

- **2000 – 2002**: Co-supervision of a **Ph.D student** (Juan Andres Restrepo-Specht), Laboratory of Analysis and Architecture of Systems - National Center for Scientific Research, Toulouse, France. Subject: 3D object modelling from incremental triangular mesh generation for robotic applications.

Publications: International Journals

Summary: 42 journal papers (all ISI-JCR ranked) (**12** *IEEE journals*, **13** *Elsevier journals*, **6** *Springer journals*, **2** *SPIE journals*, **2** *IET journals*, **7** *others*).

Quartile	Q1	Q2	Q3	Q4
Distribution (ISI-JCR)	21	11	8	2

1. **A. D. Sappa**, C. Aguilera, J. Carvajal, M. Oliveira, D. Romero, B. Vintimilla, R. Toledo. *Monocular visual odometry: Across-spectral image fusion based approach.* **Robotics and Autonomous Systems**, Vol. 85, November **2016**, pp. 26-36. (JCR 2014: 11 from 23 in Robotics **IF=1.618**)

2. M. Oliveira, V. Santos, **A. D. Sappa**, P. Dias, A. Moreira. *Incremental texture mapping for autonomous driving.* **Robotics and Autonomous Systems**, Vol. 84, October **2016**, pp. 113-128. (JCR 2014: 11 from 23 in Robotics **IF=1.618**)

3. M. Oliveira, V. Santos, **A. D. Sappa**, P. Dias, A. Moreira. *Incremental Scenario Representations for Autonomous Driving using Geometric Polygonal Primitives.* **Robotics and Autonomous Systems**, Vol. 83, September **2016**, pp. 312-325. (JCR 2014: 11 from 23 in Robotics **IF=1.618**)

4. **A. D. Sappa**, P. Carvajal, C. Aguilera, M. Oliveira, D. Romero and Vintimilla. *Wavelet based visible and infrared image fusion: a comparative study.* **Sensors**, Vol. 16, No. 6, June **2016**, pp. 1-15. (JCR 2014: 10 from 56 in Instruments & Instrumentation, **IF=2.033**)

5. T. Mouats, N. Aouf, **A. D. Sappa**, C. Aguilera and R. Toledo. *Multi-Spectral Stereo Odometry.* **IEEE Transactions on Intelligent Transportation Systems**, Vol. 16, No. 3, June **2015**, pp. 1210-1224. (JCR 2014: 41 from 249 in Engineering, Electrical & Electronic, **IF=2.534**)

6. M. Oliveira, V. Santos and **A. D. Sappa**. *Multimodal Inverse Perspective Mapping.* **Information Fusion**, Vol. 24, July **2015**, pp. 108-121. (JCR 2014: 9 from 123 in Computer Science: Artificial Intelligence, **IF=4.353**)

7. N. Onkarappa, and **A. D. Sappa**. *Synthetic sequences and ground-truth flow field generation for algorithm validation.* **Multimedia Tools and Applications**, Vol. 74, No. 9, May **2015**, pp. 3121-3125. (JCR 2014: 32 from 102 in Computer Science, Theory & Methods, **IF=1.331**)

8. M. Oliveira, **A. D. Sappa** and V. Santos. *A probabilistic approach for color correction in image mosaicking applications.* **IEEE Transactions on Image Processing**, Vol. 14,

No. 2, January **2015**, pp. 508-523. (JCR 2014: 12 from 123 in Computer Science: Artificial Intelligence, **IF=3.735**)

9. M. Piñol, **A. D. Sappa** and R. Toledo. *Adaptive Feature Descriptor Selection based on a Multi-Table Reinforcement Learning Strategy.* <u>**Neurocomputing**</u>, Vol. 150, Part A, February **2015**, pp. 106-115. (JCR 2014: 36 from 123 in Computer Science: Artificial Intelligence, **IF=2.392**)

10. M. Rouhani, **A. D. Sappa** and E. Boyer. *Implicit B-Spline Surface Reconstruction.* <u>**IEEE Transactions on Image Processing**</u>, Vol. 14, No. 1, January **2015**, pp. 22-32. (JCR 2014: 12 from 123 in Computer Science: Artificial Intelligence, **IF=3.735**)

11. P. Ricaurte, C. Chilán, C. Aguilera-Carrasco, B. Vintimilla and **A. D. Sappa**. *Feature Point Descriptors: Infrared and Visible Spectra.* <u>**Sensors**</u>, Vol. 14, No. 2, February **2014**, pp. 3690-3701. (JCR 2014: 10 from 56 in Instruments & Instrumentation, **IF=2.245**)

12. N. Onkarappa, and **A. D. Sappa**. *Speed and texture: an empirical study on optical flow accuracy in ADAS scenarios.* <u>**IEEE Transactions on Intelligent Transportation Systems**</u>, Vol. 15, No. 1, February **2014**, pp. 136-147. (JCR 2014: 41 from 249 in Engineering, Electrical & Electronic, **IF=2.377**)

13. M. Rouhani and **A. D. Sappa**. *The Richer Representation the Better Registration.* <u>**IEEE Transactions on Image Processing**</u>, Vol. 22, No. 12, December **2013**, pp. 5036-5049. (JCR 2013: 14 from 121 in Computer Science: Artificial Intelligence, **IF=3.111**)

14. N. Onkarappa, and **A. D. Sappa**. *A Novel Space Variant Image Representation.* <u>**Journal of Mathematical Imaging and Vision**</u>, Vol. 47, No. 1, September **2013**, pp. 48-59. (JCR 2013: 12 from 250 in Mathematics, Applied, **IF=2.330**)

15. F. Barrera, F. Lumbreras and **A. D. Sappa**. *Multispectral Piecewise Planar Stereo using Manhattan-World Assumption.* <u>**Pattern Recognition Letters**</u>, Vol. 34, No. 1, January **2013**, pp. 52-61. (JCR 2013: 71 from 121 in Computer Science, Artificial Intelligence, **IF=1.062**)

16. C. Aguilera, F. Barrera, F. Lumbreras, **A. D. Sappa** and R. Toledo. *Multispectral Image Feature Points.* <u>**Sensors**</u>, Vol. 12, No. 9, September **2012**, pp. 12661-12672. (JCR 2012: 8 from 57 in Instruments & Instrumentation, **IF=1.953**)

17. F. Barrera, F. Lumbreras and **A. D. Sappa**. *Multimodal Stereo Vision System: 3D Data Extraction and Algorithm Evaluation.* <u>**IEEE Journal of Selected Topics in Signal Processing**</u>, Vol. 6, No. 5, September **2012**, pp.437-446. (JCR 2012: 16 from 243 in Engineering, Electrical & Electronic, **IF=3.297**)

18. M. Rouhani and **A. D. Sappa**. *Implicit Polynomial Representation through a Fast Fitting Error Estimation.* <u>**IEEE Transactions on Image Processing**</u>, Vol. 21, No. 4, April **2012**, pp. 2089-2098. (JCR 2012: 13 from 115 in Computer Science: Artificial Intelligence, **IF=3.199**)

19. F. Dornaika, J. Alvarez, **A. D. Sappa** and A. López. *A New Framework for Stereo Sensor Pose through Road Segmentation and Registration.* **IEEE Transactions on Intelligent Transportation Systems**, Vol. 12, No. 4, December **2011**, pp. 954-966. (JCR 2011: 1 from 28 in Transportation Science & Technology, **IF=3.452**)

20. C. Julià, **A. D. Sappa**, F. Lumbreras, J. Serrat and A. López. *Rank Estimation in Missing Data Matrix Problems.* **Journal of Mathematical Imaging and Vision**, Vol. 39, No. 2, February **2011**, pp. 140-160. (JCR 2011: 35 from 245 in Mathematics, Applied, **IF=1.391**)

21. C. Julià, F. Lumbreras, and **A. D. Sappa**. *A Factorization-based Approach to Photometric Stereo.* **International Journal of Imaging Systems and Technology**, Vol. 21, No. 1, February **2011**, pp. 115-119. (JCR 2011: 153 from 244 in Engineering, Electrical & Electronic, **IF=0.779**)

22. D. Gerónimo, A. López, **A. D. Sappa** and T. Graf. *Survey of Pedestrian Detection for Advanced Driver Assistance Systems.* **IEEE Transactions on Pattern Analysis and Machine Intelligence**, Vol. 32, No. 7, July **2010**, pp. 1239-1258. (JCR 2010: 1 from 108 in Computer Science, Artificial Intelligence, **IF=5.308**)

23. D. Gerónimo, **A. D. Sappa**, D. Ponsa and A. López. *2D-3D Based On-Board Pedestrian Detection System.* **Computer Vision and Image Understanding**, Vol 114, No. 5, May **2010**, pp. 583-595. (JCR 2010: 19 from 108 in Computer Science, Artificial Intelligence, **IF=2.534**)

24. C. Julià, **A. D. Sappa**, F. Lumbreras, J. Serrat and A. López. *An iterative multiresolution scheme for SFM with missing data: single and multiple object scenes.* **Image and Vision Computing**, Vol. 28, No. 1, January **2010**, pp. 164-176. (JCR 2010: 21 from 99 in Computer Science, Software Engineering, **IF=1.578**)

25. C. Julià, **A. D. Sappa**, F. Lumbreras, J. Serrat and A. López. *Predicting Missing Ratings in Recommender Systems: Adapted Factorization Approach.* **International Journal of Electronic Commerce**, Vol. 14, No. 2, Winter **2009-2010**, pp. 89-108. (JCR 2009: 28 from 93 in Computer Science, Software Engineering, **IF=1.600**)

26. C. Julià, **A. D. Sappa**, F. Lumbreras, J. Serrat and A. López. *An Iterative Multiresolution Scheme for SFM with Missing Data.* **Journal of Mathematical Imaging and Vision**, Vol. 34, No. 3, July **2009**, pp. 240-258. (JCR 2009: 40 from 204 in Mathematics, Applied, **IF=1.437**)

27. F. Dornaika and **A. D. Sappa**. *A Featureless and Stochastic Approach to On-board Stereo Vision System Pose.* **Image and Vision Computing**, Vol. 27, No. 9, August **2009**, pp. 1382-1393. (JCR 2009: 30 from 93 in Computer Science, Software Engineering, **IF=1.474**)

28. F. Dornaika and **A. D. Sappa**. *Instantaneous 3D Motion from Image Derivatives using the Least Trimmed Square Regression.* **Pattern Recognition Letters**, Vol. 30, No.

5, April **2009**, pp. 535-543. (JCR 2009: 54 from 103 in Computer Science, Artificial Intelligence, **IF=1.303**)

29. **A. D. Sappa**, F. Dornaika, D. Ponsa, D. Gerónimo and A. López. *An Efficient Approach to On-Board Stereo Vision System Pose Estimation.* **IEEE Transactions on Intelligent Transportation Systems**, Vol. 9, No. 3, Sept. **2008**, pp. 476-490. (JCR 2008: 1 from 23 in Transportation Science & Technology, **IF=2.844**)

30. F. Dornaika and **A. D. Sappa**. *Evaluation of an Appearance-based 3D Face Tracker using Dense 3D Data.* **Machine Vision and Applications**, 19(5-6): 427-441, **2008**. (JCR 2008: 75 from 229 in Engineering, Electrical & Electronic, **IF=0.569**)

31. H. Berti, **A. D. Sappa** and O. Agamennoni. *Improved Dynamic Window Approach by Using Lyapunov Stability Criteria.* **Latin American Applied Research**, Vol. 38, No. 4, October **2008**, pp. 289-298. (JCR 2008: 98 from 116 in Engineering, Chemical, **IF=0.292**)

32. J. Julià, **A. D. Sappa**, F. Lumbreras, J. Serrat and A. López. *Rank Estimation in 3D Multibody Motion Segmentation.* **IEE Electronics Letters**, 44(4): 279–280, **2008**. (JCR 2008: 108 from 229 in Engineering, Electrical & Electronic, **IF=1.140**)

33. F. Dornaika and **A. D. Sappa**. *Rigid and Non-rigid Face Motion Tracking by Aligning Texture Maps and Stereo 3D Models.* **Pattern Recognition Letters**, 28(15): 2116-2126, **2007**. (JCR 2007: 52 from 93 in Computer Science: Artificial Intelligence, **IF=0.853**)

34. **A. D. Sappa** and M. Garcia. *Incremental Integration of Multiresolution Range Images.* **The Imaging Science Journal**, 55(2), **2007**. (JCR 2007: 10 from 11 in Imaging Science & Potographic Technology, **IF=0.220**)

35. **A. D. Sappa** and B. Vintimilla. *Cost-Based Closed Contour Representations.* **Journal of Electronic Imaging**, 16(2), **2007**. (JCR 2007: 147 from 227 in Engineering, Electrical & Electronic, **IF=0.455**)

36. **A. D. Sappa** and M. Garcia. *Coarse-to-Fine Approximation of Range Images with Bounded Error Adaptive Triangular Meshes.* **Journal of Electronic Imaging**, 16(2), **2007**. (JCR 2007: 147 from 227 in Engineering, Electrical & Electronic, **IF=0.455**)

37. **A. D. Sappa** and M. Garcia. *Generating Compact Representations of Static Scenes by Means of 3D Object Hierarchies.* **The Visual Computer**, 23(1): 143-154, **2007**. (JCR 2007: 54 from 84 in Computer Science, Software Engineering, **IF=0.708**)

38. **A. D. Sappa**. *Splitting up Panoramic Range Images into Compact $2\frac{1}{2}D$ Representations.* **International Journal of Imaging Systems and Technology**, 16(3): 85-91, **2006**. (JCR 2006: 76 from 206 in Engineering, Electrical & Electronic, **IF=0.983**)

39. **A. D. Sappa**, D. Gerónimo, F. Dornaika and A. López. *On-board Camera Extrinsic Parameter Estimation.* <u>**IEE Electronics Letters**</u>, Vol. 42, No. 13, June 2006, pp. 745-746. (JCR 2006: 69 from 206 in Engineering, Electrical & Electronic, **IF=1.063**)

40. **A. D. Sappa**. *Unsupervised Contour Closure Algorithm for Range Image Edge-Based Segmentation.* <u>**IEEE Transactions on Image Processing**</u>, 15(2): 377–384, **2006**. (JCR 2006: 5 from 85 in Computer Science: Artificial Intelligence, **IF=2.715**)

41. A. Restrepo-Spetch, **A. D. Sappa** and M. Devy. *Edge Registration Versus Triangular Mesh Registration, a Comparative Study.* <u>**Signal Processing: Image Communication**</u>, 20: 853–868, **2005**. (JCR 2005: 53 from 208 in Engineering, Electrical & Electronic, **IF=1.264**)

42. M. Garcia and **A. D. Sappa**. *Efficient Generation of Discontinuity-Preserving Adaptive Triangulations from Range Images.* <u>**IEEE Transactions on Systems, Man, and Cybernetics (Part B)**</u>, 34(5): 2003-2014, **2004**. (JCR 2004: 6 from 18 in Computer Science, Cybernetics, **IF=1.052**)

Publications: Edited Books

1. Multimodal Interaction in Image and Video Applications. Editors: **A. D. Sappa** and J. Vitrià. Intelligent Systems Reference Library, Vol. 48, Springer Verlag, 2013 (**top 25% most downloaded eBooks in the relevant Springer eBook Collection in 2013**.)

2. Computer Graphics and Imaging. Editors: **A. D. Sappa** and G.A. Triantafyllidis. Crete, Greece, June 2012. ISBN: 978-0-88986-921-9.

3. Computer Graphics and Imaging. Editor: **A. D. Sappa**. Innsbruck, Austria, Febrary 2010. ISBN: 978-0-88986-824-3.

Publications: Book Chapters

1. C. Aguilera, M. Ramos, and **A. D. Sappa**. Simulated Annealing: A Novel Application of Image Processing in the Wood Area, chapter 5 in Simulated Annealing – Advances, Applications and Hybridizations, Book edited by: Marcos de Sales Guerra Tsuzuki, InTech Europe, Croatia, August 2012, pp. 91-104. (Open Access).

2. **A. D. Sappa**, D. Gerónimo, F. Dornaika, M. Rouhani and A. López. Moving object detection from mobile platforms using stereo data registration, chapter 3 in Computational Intelligence paradigms in advanced pattern classification, Ed. Marek R. Ogiela and Lakhmi C. Jain, Springer-Verlag's Book Series, Germany, 2012, pp. 25-37.

3. D. Gerónimo, **A. D. Sappa**, and A. López. Stereo-based Candidate Generation for Pedestrian Protection Systems, chapter 9 in Binocular Vision: Development, Depth and Disorders, Book edited by: Jacques McCoun and Lucien Reeves, NOVA Science Publishers, USA, July 2010, pp. 189-208.

4. **A. D. Sappa**, N. Aifanti, S. Malassiotis and M. G. Strintzis. Prior Knowledge Based Motion Model Representation, chapter 16 in Progress in Computer Vision and Image Analysis, Ed. H. Bunke et al., World Scientific Publishing, USA, August 2009, pp. 283-299 (invited paper from ELCVIA).

5. N. Aifanti, **A. D. Sappa**, N. Grammalidis and S. Malassiotis. Advances in Tracking and Recognition of Human Motion, Encyclopedia of Information Science and Technology, 2nd. Edition, IRMA Research, USA, 2009, pp. 65-71.

6. F. Dornaika and **A. D. Sappa**. Real Time Image Registration for Planar Structure and 3D Sensor Pose Estimation, chapter 18 in Stereo Vision, Book edited by: Asim Bhatti, InTech Europe, Croatia, November 2008, pp. 299-316. (Open Access).

7. F. Dornaika and **A. D. Sappa**. Improving Appearance-Based 3D Face Tracking Using Sparse Stereo Data, chapter 25 (Part VIII) in Advances in Computer Graphics and Computer Vision, Ed. J. Braz, A. Ranchordas, H. Araújo and J. Jorge, Springer Verlag, Germany, 2007, pp. 354-366, (best papers VISAPP 2006).

8. **A. D. Sappa**, D. Gerónimo, F. Dornaika and A. López. Stereo Vision Camera Pose Estimation for On-Board Applications, chapter 3 in Scene Reconstruction, Pose Estimation and Tracking, Book edited by: Rustam Stolking, InTech Europe, Croatia, June 2007, pp. 39-50. (Open Access).

9. F. Dornaika and **A. D. Sappa**. SFM for Planar Scenes: a Direct and Robust Approach, chapter 16 (Part 2) in Informatics in Control, Automation and Robotics II, Ed. J. Filipe, J. Ferrier, J. Cetto and M. Carvalho, Springer Verlag, Germany, 2007, pp. 129-136. (best papers ICINCO 2005).

10. **A. D. Sappa**, N. Aifanti, S. Malassiotis and N. Grammalidis. Survey of 3D Human Body Representations, Encyclopedia of Information Science and Technology I-V, IRMA Research, USA, 2005, pp. 2696-2701.

11. N. Aifanti, **A. D. Sappa**, N. Grammalidis and S. Malassiotis. Human Motion Tracking and Recognition, Encyclopedia of Information Science and Technology I-V, IRMA Research, USA, 2005, pp. 1355-1360.

12. **A. D. Sappa**, N. Aifanti, S. Malassiotis and M. G. Strintzis. Prior Knowledge Based Motion Model Representation, Electronic Letters on Computer Vision and Image Analysis 5(3):55-67, Special Issue on Articulated Motion & Deformable Objects, CVC Press, Spain, August 2005.

13. **A. D. Sappa**, N. Aifanti, N. Grammalidis and S. Malassiotis. Advances in Vision-Based Human Body Modeling, chapter one in: 3D Modeling and Animation:Systhesis and Analysis Techniques for the Human Body, N. Sarris and M. Strintzis, IRM Press, USA, pp. 1-26, July 2003.

14. M. A. Garcia and **A. D. Sappa**. Adaptive Triangulation of Range Images, CVonline (Computer Vision on line), http:\\homepages.inf.ed.ac.uk\rbf\CVonline\.

Publications: LNCS and Conference Proceedings with review committee

1. C. Aguilera, F. Aguilera, Angel D. Sappa, C. Aguilera and R. Toledo, Learning cross-spectral similarity measures with deep convolutional neural networks, IEEE Int. Conf. on Computer Vision and Pattern Recognition (CVPR) Workshops, Las vegas, USA, June 26-July 1, 2016.

2. D. G. Romero, A. Frizera, A. D. Sappa, B. Vintimilla and T. F. Bastos, A predictive model for human activity recognition by observing actions and context, Int. Conf. on Advanced Concepts for Intelligent Vision Systems, LNCS Vol. 9386, Springer Verlag, Catania, Italy, October 28-29, 2015, pp. 323-333.

3. M. Oliveira, V. Santos, A. D. Sappa and P. Dias, Scene Representations for Autonomous Driving: an approach based on polygonal primitives, ROBOT'2015: Second Iberian Robotics Conference, Advances in Intelligent Systems and Computing, Vol. 417, Springer Verlag, Lisbon, Portugal, November 19-21, 2015, pp. 503-515.

4. J. Poujol, C. Aguilera-Carrasco, E. Danos, B. Vintimilla, R. Toledo and A. D. Sappa, A Visible-Thermal Fusion based Monocular Visual Odometry, ROBOT'2015: Second Iberian Robotics Conference, Advances in Intelligent Systems and Computing, Vol. 417, Springer Verlag, Lisbon, Portugal, November 19-21, 2015, pp. 517-528.

5. M. Oliveira, L. Seabra Lopes, G. Hyun Lim, S. Hamidreza Kasaei, A. D. Sappa and A. Tomé, Concurrent Learning of Visual Codebooks and Object Categories in Open-ended Domains, IEEE Int. Conf. on Intelligent Robots and Systems, Hamburg, Germany, September 28 - October 02, 2015, pp. 2488-2495.

6. C. Aguilera-Carrasco, Angel D. Sappa and R. Toledo, LGHD: A Feature Descriptor for Matching Across Non-Linear Intensity Variations, IEEE Int. Conf. on Image Processing, Quebec, Canada, September 27-30, 2015, pp. 178-181.

7. M. Cruz, C. Aguilera-Carrasco, B. Vintimilla, R. Toledo and Angel D. Sappa, Cross-Spectral Image Registration and Fusion: an Evaluation Study, Int. Conf. on Machine Vision and Machine Learning, Barcelona, Spain, July 13-14, 2015, pp. 331-1, 331-5.

8. M. Rouhani, E. Boyer and A. D. Sappa, Non-Rigid Registration meets Surface Reconstruction, Int. Conf. on 3D Vision, Tokyo, Japan, December 8-11, 2014, pp. 617-624.

9. P. Ricaurte, C. Chilán, C. Aguilera-Carrasco, B. Vintimilla and A. D. Sappa, Performance Evaluation of Feature Point Descriptors in the Infrared Domain, Int. Conf. on Computer Vision Theory and Applications, Lisbon, Portugal, January 5-8, 2014, vol 1, pp 545-550.

10. N. Onkarappa, C. Aguilera-Carrasco, B. Vintimilla and A. D. Sappa, Cross-spectral Stereo Correspondence using Dense Flow Fields, Int. Conf. on Computer Vision Theory and Applications, Lisbon, Portugal, January 5-8, 2014, vol 3, pp 613-617.

11. A. Amato, F. Lumbreras and A. D. Sappa, A General-purpose Crowdsourcing Platform for Mobile Devices, Int. Conf. on Computer Vision Theory and Applications, Lisbon, Portugal, January 5-8, 2014, vol 3, pp 211-215.

12. A. Amato, A. D. Sappa, A. Fornés, F. Lumbreras and J. Lladós, Divide and Conquer: atomizing and parallelizing a task in a mobile crowdsourcing platform, Int. ACM Workshop on Crowdsourcing for Multimedia, Barcelona, Spain, October 21-25, 2013.

13. G. Ros, J. Guerrero, A. D. Sappa, D. Ponsa and A. López, Fast and Robust l_1-averaging-based Pose Estimation for Driving Scenarios, British Machine Vision Conference, Bristol, United Kingdom, September 9-13, 2013.

14. M. D. Pistarelli, A. D. Sappa and R. Toledo, Multispectral Stereo Image Correspondence, Int. Conf. on Computer Analysis of Images and Patterns, LNCS Vol. 8048, Springer Verlag, York, UK, August 27-29, 2013, pp. 217-224.

15. N. Onkarappa and A. D. Sappa, Laplacian Derivative Based Regularization for Optical Flow Estimation in Driving Scenario, Int. Conf. on Computer Analysis of Images and Patterns, LNCS Vol. 8048, Springer Verlag, York, UK, August 27-29, 2013, pp. 483-490.

16. G. Ros, J. Guerrero, A. D. Sappa, D. Ponsa and A. López, VSLAM pose initialization via Lie groups and Lie algebras optimization, IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May 6-10, 2013.

17. G. Vino and A. D. Sappa, Revisiting Harris Corner Detector Algorithm: a Gradual Thresholding Approach, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 7950, Springer Verlag, Póvoa de Varzim, Portugal, June 26-28, 2013, pp. 354-363.

18. M. Piñol, A. D. Sappa, and R. Toledo, Multi-Table Reinforcement Learning for Visual Object Recognition, International Conference on Signal and Image Processing, LNEE Vol. 221 Springer Verlag, Coimbatore, India, December 13-15, 2012, pp. 469-480.

19. N. Onkarappa, S. Veerabhadrappa and A. D. Sappa, Optical Flow in Onboard Applications: a Study on the Relationship between Accuracy and Scene Texture, International Conference on Signal and Image Processing, LNEE Vol. 221 Springer Verlag, Coimbatore, India, December 13-15, 2012, pp. 257-267.

20. M. Rouhani and A. D. Sappa, Non-Rigid Shape Registration: A Single Linear Least Squares Framework, 12th European Conference on Computer Vision, LNCS Vol. 7578 Springer Verlag, Firenze, Italy, October 7-13, 2012, pp. 264-277.

21. M. Oliveira, V. Santos and A. D. Sappa, Short term path planning using a multiple hypothesis evaluation approach for an autonomous driving competition, IEEE 4th Workshop on Planning,Perception and Navigation for Intelligent Vehicles, Vilamoura, Algarve, Portugal, October 7, 2012.

22. G. Ros, A. D. Sappa, D. Ponsa and A. López, Visual SLAM for Driverless Cars: A Brief Survey, IEEE Workshop on Navigation, Perception, Accurate Positioning and Mapping for Intelligent Vehicles, Alcalá de Henares, Spain, June 3, 2012.

23. M. Piñol, A. D. Sappa, A. López and R. Toledo, Feature Selection Based on Reinforcement Learning for Object Recognition, Adaptive Learning Agents Workshop, Valencia, Spain, June 4-8, 2012, pp. 33-39.

24. N. Onkarappa and A. D. Sappa, An Empirical Study on Optical Flow Accuracy Depending on Vehicle Speed, IEEE Intelligent Vehicles Symposium, Alcalá de Henares, Spain, June 3-7, 2012, pp. 1138-1143.

25. M. Oliveira, A. D. Sappa and V. Santos, Color Correction for Onboard Multi-camera Systems using 3D Gaussian Mixture Models, IEEE Intelligent Vehicles Symposium, Alcalá de Henares, Spain, June 3-7, 2012, pp. 299-303.

26. F. Barrera, F. Lumbreras, and A. D. Sappa, Evaluation of Similarity Functions in Multi-modal Stereo, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 7324 Springer Verlag, Aveiro, Portugal, June 25-27, 2012, pp. 320-329.

27. M. Oliveira, A. D. Sappa and V. Santos, Color Correction using 3D Gaussian Mixture Models, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 7324 Springer Verlag, Aveiro, Portugal, June 25-27, 2012, pp. 97-106.

28. F. Barrera, F. Lumbreras, C. Aguilera and A. D. Sappa, Planar-Based Multispectral Stereo, 11th Quantitative InfraRed Thermography, Naples, Italy, June 11-14, 2012.

29. C. Aguilera, F. Barrera, A. D. Sappa and R. Toledo, A Novel SIFT-Like-Based Approach for FIR-VS Images Registration, 11th Quantitative InfraRed Thermography, Naples, Italy, June 11-14, 2012.

30. M. Rouhani and A. D. Sappa, Correspondence Free Registration through a Point-to-Model Distance Minimization, IEEE Int. Conf. on Computer Vision, Barcelona, Spain, November 6-13, 2011, pp. 2150-2157.

31. N. Onkarappa and A. D. Sappa, Space Variant Representations for Mobile Platform Vision Applications, Int. Conf. on Computer Analysis of Images and Patterns, LNCS Vol. 6855, Springer Verlag, Seville, Spain, August 29-31, 2011, pp. 146-154.

32. M. Rouhani and A. D. Sappa, Implicit B-Spline Fitting using the 3L Algorithm, IEEE Int. Conf. on Image Processing, Brussels, Belgium, September 11-14, 2011, pp. 909-912.

33. M. Oliveira, A. D. Sappa and V. Santos, Unsupervised Local Color Correction for Coarsely Registered Images, IEEE Int. Conf. on Computer Vision and Pattern Recognition,Colorado Springs, USA, June 21-23, 2011, pp. 201-208.

34. F. Barrera, F. Lumbreras and A. D. Sappa, Multimodal Template Matching Based on Gradient and Mutual Information Using Scale Space, IEEE Int. Conf. on Image Processing, Hong Kong, September 26-29, 2010, pp. 2749-2752.

35. M. Rouhani and A. D. Sappa, A Fast Implicit Polynomial Fitting Approach, IEEE Int. Conf. on Image Processing, Hong Kong, September 26-29, 2010, pp. 1429-1432.

36. N. Onkarappa and A. D. Sappa, On-Board Monocular Vision System Pose Estimation through a Dense Optical Flow, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 6111, Springer Verlag, Póvoa de Varzim, Portugal, June 21-23, 2010, pp. 230-239.

37. M. Rouhani and A. D. Sappa, Relaxing the 3L Algorithm for an Accurate Implicit Polynomial Fitting, IEEE Int. Conf. on Computer Vision and Pattern Recognition, San Francisco, CA, USA, June 13-18, 2010.

38. A. D. Sappa and M. Rouhani, Efficient Distance Estimation for Fitting Implicit Quadric Surfaces, IEEE Int. Conf. on Image Processing, Cairo, Egypt, November 7-11, 2009, pp. 3521-3524.

39. M. Rouhani and A. D. Sappa, A Novel Approach to Geometric Fitting of Implicit Quadrics, Int. Conf. on Advanced Concepts for Intelligent Vision Systems, LNCS Vol. 5807, Springer Verlag, Bordeaux, France, September 2009, pp. 121-132.

40. C. Julià, A. D. Sappa, F. Lumbreras, J. Serrat and A. López, Photometric Stereo through an Adapted Alternation Approach, IEEE Int. Conf. on Image Processing, San Diego, California, USA, October 12-15, 2008, pp. 1500-1503.

41. C. Julià, A. D. Sappa, F. Lumbreras, J. Serrat and A. López, An Adapted Alternation Approach for Recommender Systems, IEEE Int. Conf. on e-Business Engineering, Xi'an, China, October 22-24, 2008, pp. 128-135.

42. A. D. Sappa, F. Dornaika, D. Gerónimo and A. López., Registration-based moving object detection from a moving camera, IROS2008 2nd Workshop on Perception, Planning and Navigation for Intelligent Vehicles, Nice, France, September 26, 2008, pp. 65-69.

43. C. Julià, A. D. Sappa, F. Lumbreras, J. Serrat and A. López, Recovery of Surface Normals and Reflectance from Different Lighting Conditions, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 5112, Springer Verlag, Póvoa de Varzim, Portugal, June 25-27, 2008, pp. 315-325.

44. F. Dornaika and A. D. Sappa, Real Time On Board Stereo Camera Pose through Image Registration, IEEE Intelligent Vehicles Symposium, Eindhoven, Netherlands, June 4-6, 2008, pp 804-809.

45. F. Dornaika and A. Sappa, Real-time Vehicle Ego-Motion using Stereo Pairs and Particle Filters, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 4633, Springer Verlag, Montreal, Canada, August 2007, pp 469-480.

46. A. D. Sappa, F. Dornaika, D. Gerónimo and A. López, Efficient On-Board Stereo Vision Pose Estimation, Computer Aided Systems Theory, LNCS Vol. 4739, Springer Verlag, November 2007, pp. 1183-1190 (selected paper from EUROCAST2007).

47. A. D. Sappa, R. Herrero, F. Dornaika, D. Gerónimo and A. López, Road Approximation in Euclidean and v-Disparity Space: A Comparative Study, Computer Aided Systems Theory, LNCS Vol. 4739, Springer Verlag, November 2007, pp. 1105-1112 (selected paper from EUROCAST2007).

48. C. Julià, A. D. Sappa, F. Lumbreras, J. Serrat and A. López, Motion Segmentation from Feature Trajectories with Missing Data, 3rd. Iberian Conference on Pattern Recognition and Image Analysis, LNCS Vol. 4477, Springer Verlag, Girona, Spain, June 2007, pp. 483-490.

49. D. Gerónimo, A. López and A. D. Sappa, Computer Vision Approaches to Pedestrian Detection: Visible Spectrum Survey, 3rd. Iberian Conference on Pattern Recognition and Image Analysis, LNCS Vol. 4477, Springer Verlag, Girona, Spain, June 2007, pp. 547-554.

50. D. Gerónimo, A. López, D.Ponsa and A. D. Sappa, Haar Wavelets and Edge Orientation Histograms for On-board Pedestrian Detection, 3rd. Iberian Conference on Pattern Recognition and Image Analysis, LNCS Vol. 4477, Springer Verlag, Girona, Spain, June 2007, pp. 418-425.

51. H. Berti, A. D. Sappa and O. Agamennoni, Autonomous Robot Navigation with a Global and Asymptotic Convergence, IEEE Int. Conf. on Robotics and Automation, Roma, Italy, April 2007, pp. 2712-2717.

52. D. Gerónimo, A. D. Sappa, A. López and D. Ponsa, Adaptive Image Sampling and Windows Classification for On-board Pedestrian Detection, Int. Conf. on Computer Vision Systems, Bielefeld, Germany, March 2007. (Open Access).

53. A. D. Sappa, F. Dornaika, D. Gerónimo and A. López, Efficient On-Board Stereo Vision Pose Estimation, EUROCAST2007, Workshop on Cybercars and Intelligent Vehicles, Las Palmas de Gran Canaria, Spain, February, 2007, pp. 406-409.

54. A. D. Sappa, R. Herrero, F. Dornaika, D. Gerónimo and A. López, Road Approximation in Euclidean and v-Disparity Space: A Comparative Study, EUROCAST2007, Workshop on Cybercars and Intelligent Vehicles, Las Palmas de Gran Canaria, Spain, February, 2007, pp. 368-369.

55. A. D. Sappa, and B.Vintimilla, Edge Point Linking by Means of Global and Local Schemes, IEEE Int. Conf. on Signal-Image Technology and Internet-Based Systems, Hammamet, Tunisia, December 2006, pp. 551-560.

56. F. Dornaika and A. D. Sappa, 3D Face Tracking using Appearance Registration and Robust Iterative Closest Point Algorithm, 21st International Symposium on Computer and Information Sciences, LNCS Vol. 4263, Springer Verlag, Istanbul, Turkey, November 2006, pp. 532-541.

57. F. Dornaika and A. D. Sappa, Rigid and Non-Rigid Face Motion Tracking by Aligning Texture Maps and Stereo-Based 3D Models, Int. Conf. on Advanced Concepts for Intelligent Vision Systems, LNCS Vol. 4179, Springer Verlag, Antwerp, Belgium, September 2006, pp. 675-684.

58. C. Julià, A. D. Sappa, F. Lumbreras, J. Serrat and A. López, An Iterative Multiresolution Scheme for SFM, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 4141, Springer Verlag, Póvoa de Varzim, Portugal, September 18-20, 2006, pp. 804-815.

59. A. D. Sappa, D. Gerónimo, F. Dornaika and A. López, Real Time Vehicle Pose Using On-Board Stereo Vision System, Int. Conf. on Image Analysis and Recognition, LNCS Vol. 4142, Springer Verlag, Póvoa de Varzim, Portugal, September 18-20, 2006, pp. 205-216.(Nominated for a Book Chapter in "Scene Reconstruction, Pose Estimation and Tracking")

60. D. Gerónimo, A. D. Sappa, A. López and D. Ponsa, Pedestrian Detection using Adaboost Learning of Features and Vehicle Pitch Estimation, Int. Conf. on Visualization, Imaging, and Image Processing, Palma de Mallorca, Spain, August 2006.

61. F. Dornaika and A. D. Sappa, 3D Motion from Image Derivatives using the Least Trimmed Square Regression, Int. Workshop on Intelligent Computing in Pattern Analysis/Synthesis, LNCS Vol. 4153, Springer Verlag, Xi'an, China, August 2006, pp. 76-84.

62. A. D. Sappa and F. Dornaika, An Edge-Based Approach to Motion Detection, Int. Conf. on Computational Science, LNCS Vol. 3991, Springer Verlag, Reading, United Kingdom, May 28-31, 2006, pp. 563-570.

63. C. Julià, A. D. Sappa, F. Lumbreras, J. Serrat and A. López, Factorization with Missing and Noisy Data, Int. Conf. on Computational Science, LNCS Vol. 3991, Springer Verlag, Reading, United Kingdom, May 28-31, 2006, pp. 555-562.

64. F. Dornaika and A. D. Sappa, Improving Appearance-Based 3D Face Tracking Using Sparse Stereo Data, Int. Conf. on Computer Vision Theory and Applications, Setúbal, Portugal, February 2006, pp. 310-317.

65. F. Dornaika and A. D. Sappa, Appearance-based 3D Face Tracker: An Evaluation Study, IEEE Int. Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance, Beijing, China, October 2005, pp. 121-128.

66. F. Dornaika and A. D. Sappa, SFM for Planar Scenes: a Direct and Robust Approach, Int. Conf. on Informatics in Control, Automation and Robotics, Barcelona, Spain, September 2005, pp. 175-180.

67. A. D. Sappa, Efficient Closed Contour Extraction from Range Image's Edge Points, IEEE Int. Conf. on Robotics and Automation, Barcelona, Spain, April 2005, pp. 4344-4349.

68. A. D. Sappa, N. Aifanti, S. Malassiotis and M. G. Strintzis, 3D Gait Estimation from Monoscopic Video, IEEE International Conference on Image Processing, Singapore, October 2004, pp.1963-1966.

69. A. D. Sappa, N. Aifanti, S. Malassiotis and M. G. Strintzis, 3D Human Walking Modeling, Third Int. Workshop on Articulated Motion and Deformable Objects, LNCS Vol. 3179, Springer Verlag, Springer Verlag, Palma de Mallorca, Spain, September 2004, pp. 111-122.

70. A. D. Sappa, Automatic Extraction of Planar Projections from Panoramic Range Images, IEEE Int. Symp. on 3D Data Processing, Visualization & Transmission, Thessaloniki, Greece, September 2004.

71. A. D. Sappa, Surface Model Generation from Range Images of Industrial Environments, IEEE Int. Symp. on 3D Data Processing, Visualization & Transmission, Thessaloniki, Greece, September 2004.

72. A. D. Sappa, N. Aifanti, S. Malassiotis and M. G. Strintzis, Unsupervised Motion Classification by means of Efficient Feature Selection and Tracking, IEEE Int. Symp. on 3D Data Processing, Visualization & Transmission, Thessaloniki, Greece, September 2004.

73. A. D. Sappa and M. A. Garcia, Hierarchical Clustering of 3D Objects and its Application to Minimum Distance Computation, IEEE Int. Conf. on Robotics and Automation, New Orleans, LA, USA, pp. 5287-5292, April-May 2004.

74. A. D. Sappa, N. Aifanti, S. Malassiotis and M. G. Strintzis, Monocular 3D Human Body Reconstruction Towards Depth Augmentation of Television Sequences, IEEE International Conference on Image Processing, Barcelona, Spain, September 2003, pp. 325-328.

75. A. Restrepo-Spetch, M. Devy and A. D. Sappa, Robustness to Initial Conditions in Registration of Range Images Using the ICP algorithm, 3rd. Int. Symp. on Robotics and Automation, Toluca, Edo. de Mexico, Mexico, September 2002.

76. A. D. Sappa, Improving Segmentation Results by Studying Surface Continuity, 16th Int. Conf. on Pattern Recognition, Quebec city, Canada, August 2002, pp. 929-932.

77. M. Devy, A. Restrepo-Spetch and A. D. Sappa, Comparaison de Méthodes de Recalage de Données 3D par Construction dun Maillage Triangulaire ou Extraction des Contours 3D, 13ème Congrès Francophone AFRIF-AFIA de Reconnaissance des Formes et Intelligence Artificielle, Angers, France, January 2002 (in French).

78. A. D. Sappa, V. Bevilacqua and M. Devy., Improving a Genetic Algorithm Segmentation by means of a Fast Edge Detection Technique, IEEE Int. Conf. on Image Processing, Thessaloniki, Greece, October 2001, pp. 754-757.

79. A. D. Sappa, A. Restrepo-Spetch and M. Devy, Range Image Registration by using an Edge-Based Representation, 9th Int. Symp. on Intelligent Robotic Systems, Toulouse, France, July 2001.

80. A. D. Sappa and M. Devy, Efficient Contour Extraction in Range Image Segmentation for Building Modelling, Int. Symp. on Virtual and Augmented Architecture, Dublin, Ireland, June 2001.

81. A. D. Sappa, M. Devy and A. Restrepo-Spetch, Segmentation dImages 3D par Extraction des Contours 3D, ORASIS 2001, Congrès Francophone de Vision par Ordinateur, Cahors, France, June 2001 (in French).

82. A. D. Sappa and M. Devy, Fast Range Image Segmentation by an Edge Detection Strategy, IEEE Third International Conference on 3D Digital Imaging and Modeling, Quebec, Canada, June 2001.

83. A. D. Sappa and L. M. Garcia, Towards Real-Time Image Segmentation using Polynomial Functions, XIII Brazilian Symposium on Computer Graphics and Image Processing, Gramado, Brazil, October 2000, pp. 335.

84. A. D. Sappa, M. Devy and M. A. Garcia, Modeling Built Environments from Large Range Images, 8th Int. Symp. on Intelligent Robotic Systems, pp. 23-29, Reading, UK, July 2000.

85. J. Bozier, M. Devy and A. D. Sappa, A Geometrical Approach for the Incremental Modelling of Free Form Surface by Triangular Meshes, 8th Int. Symp. on Intelligent Robotic Systems, pp. 13-21, Reading, UK, July 2000.

86. A. D. Sappa, M. A. Garcia and B. Vintimilla, Geometric and Topological Lossy Compression of Dense Range Images, IEEE Int. Conf. on Image Processing, Vancouver, Canada, September 2000, pp.423-426.

87. A. D. Sappa and M. A. Garcia, Modeling Range Images with Bounded Error Triangular Meshes without Optimization, 15th Int. Conf. on Pattern Recognition, Barcelona, Spain, September 2000, pp. 392-395.

88. A. D. Sappa and M. A. Garcia, Incremental Multiview Integration of Range Images, 15th Int. Conf. on Pattern Recognition, Barcelona, Spain, September 2000, pp. 546-549.

89. M. A. Garcia, B. Vintimilla and A. D. Sappa, Approximation and Processing of Intensity Images with Discontinuity-Preserving Adaptive Triangular Meshes, Sixth European Conference on Computer Vision, LNCS Vol. 1842, Springer Verlag, Dublin, Ireland, July 2000, pp. 844-855.

90. M. A. Garcia, B. Vintimilla and A. D. Sappa, Efficient Approximation of Gray-Scale Images Through Bounded Error Triangular Meshes, IEEE Int. Conf. on Image Processing, Kobe, Japan, October 1999, pp. 168-171.

91. M. A. Garcia, B. Vintimilla and A. D. Sappa, Approximation of Intensity Images with Adaptive Triangular Meshes: Towards a Processable Compressed Representation, Irish Machine Vision and Image Processing Conference, Dublin, Ireland, September 1999.

92. M. A.Garcia, A. D. Sappa and L. Basañez, Efficient Generation of Object Hierarchies from 3D Scenes, IEEE Int. Conf. on Robotics and Automation, Detroit, USA, pp. 1359-1364, May 1999.

93. M. A. Garcia, S. Velázquez and A. D. Sappa, A Two-Stage Algorithm for Planning the Next View from Range Images, 9th British Machine Vision Conference, Southampton, UK, pp. 720-729, September 1998.

94. M. A. Garcia, S. Velázquez, A. D. Sappa and L. Basañez, Autonomous Sensor Planning for 3D Reconstruction of Complex Objects from Range Images, IEEE Int. Conf. on Robotics and Automation, Leuven, Belgium, pp. 3085-3090, May 1998.

95. M. A. Garcia, A. D. Sappa A. and L. Basañez, Efficient Approximation of Range Images Through Data Dependent Adaptive Triangulations, IEEE Int. Conf. on Computer Vision and Pattern Recognition, San Juan, Puerto Rico, pp. 628-633, June 1997.

96. M. A. Garcia, A. D. Sappa and L. Basañez, Fast Generation of Adaptive Quadrilateral Meshes from Range Images, IEEE Int. Conf. on Robotics and Automation, Albuquerque, USA, pp. 2813-2818, April 1997.

Invited talks & lectures

1. *Sistemas Computacionales: Transferencias de Tecnologías para el Sector Industrial*, Escuela Superior Politécnica del Litoral (ESPOL); **Guayaquil, Ecuador**; July 31st 2015. (2 hours)

2. *Técnicas de gamificación e introducción al crowdsourcing para el procesamiento de datos: teoría y práctica)*, Universidad del Bío-Bío, Concepción, Chile; **Lectures given at Barcelona, Spain**; October 6th to 18th 2014 (course, 100 hours).

3. *Gestión y estrategias de investigación y transferencia de tecnología (experiencias personales)*, Escuela Superior Politécnica del Litoral (ESPOL); **Guayaquil, Ecuador**; February 7th 2014 (workshop, 8 hours).

4. *Correspondencia Estereoscópica Multiespectral*, Escuela Superior Politécnica del Litoral (ESPOL); **Guayaquil, Ecuador**; December 20th 2013. (1 hour)

5. *Visión por Computador: Sistemas Avanzados de Asistencia a la Conducción*, Escuela Superior Politécnica del Litoral (ESPOL); **Guayaquil, Ecuador**; August 21st 2013. (1 hour)

6. *Visión por Computador: Extracción y Representación de Información 3D*, Escuela Superior Politécnica del Litoral (ESPOL); **Guayaquil, Ecuador**; August 14th 2013. (1 hour)

7. *Multispectral Image Processing*, Middle East College; **Muscat, Sultanate of Oman**; March 17th-21th, 2013 *(five day workshop: "Recent Trends in Technical Research")*. (40 hours)

8. *3D Information: Extraction and Representation*, Universidade de Aveiro; **Aveiro, Protugal**; February 20th 2013. (4 hours)

9. *Pedestrian detection from on-board vision systems*, LAAS-CNRS; **Toulouse, France**; November 16th 2010. (2 hours)

10. *Dense optical flow estimation techniques: applications to moving object detection*, LAAS-CNRS; **Toulouse, France**; October 19th 2009. (2 hours)

11. *New Challenges for Onboard Vision Systems.* **Tutorial Session** in 8th. Int. Conf. on visualization, Imaging and Image Processing (VIIP 08); **Palma de Mallorca, Spain**; September 2nd. 2008. (4 hours)

12. *Onboard Vision Systems: ADAS Applications.* Computer Science Department; Universidad Nacional de Buenos Aires; **Buenos Aires, Argentina**; February 18th 2008. (3 hours)

13. *The Computer Vision Center: a R&D model.* Engineering School; Universidad Nacional de La Pampa; **La Pampa, Argentina**; February 14th 2008. (2 hours)

14. *Range Image Processing & Representation.* Computer Science Department; Universidad Autónoma de Barcelona; **Bellaterra, Spain**; April 4rd 2005. (2 hour)

15. *Unsupervised Motion Classification by means of Efficient Feature Selection and Tracking.* Croucher Advanced Study Institute on Biometric Authentication (ASI 04), Hong Kong Baptist University; **Hong Kong**; 6-11 December 2004. (1 hour)

16. *3D modeling: monocular and range image based.* Computer Vision Center; **Bellaterra, Spain**; February 6th 2004. (1 hour)

17. *From 3D images to CAD models: LFM.* Informatics & Telematics Institute - Centre for Research and Technology, Hellas; **Thessaloniki, Greece**; September 16th 2002. (1 hour)

18. *Towards automatic CAD model extraction: the CAMERA project.* Department of Science and Technology; School of Automation and Industrial Control Engineering; Universidad Nacional de Quilmes; **Buenos Aires, Argentina**; December 21th 2001. (2 hours)

19. *Towards automatic CAD model extraction: the CAMERA project.* Department of Computer Engineering and Mathematics; School of Electrical and Computer Engineering; Universitat Rovira i Virgili; **Tarragona, Spain**; December 17th 2001. (full day, 8 hours)

20. *Automatic 3D model generation of Industrial Environments from Range Images.* School of Industrial Engineering; Universidad Nacional del Litoral; **Santa Fe, Argentina**; September 3rd. and 4th 2001. (two days workshop 12 hours)

21. *Light form modeler (LFM): software para la generación de modelos CAD a partir de imágenes 3D.* Engineering School; Universidad Nacional de La Pampa; **La Pampa, Argentina**; August 24th 2001. (3 hours)

22. *Towards Automatic CAD Model Extraction from Industrial Environment Range Images.* Computer Science Department, Trinity College; **Dublin, Ireland**; June 2001. (1 hour)

23. *Range Image Segmentation: Contour and Region Extraction by means of Minimum Spanning Tree Algorithm.* European Commission, Joint Research Centre; **Joint Research Centre**; January 2001. (1 hour)

24. *Generación de Modelos 3D a partir de Mapas de Profundidad.* Department of Computer Science; Escuela de Ciencias Experimentales y Tecnología; Universidad Rey Juan Carlos; **Madrid, Spain**; November 2000. (full day, 8 hours)

25. *Segmentation and Geometrical Representation.* Centre for Autonomous Systems, Numerical Analysis and Computing Science, Kungliga Tekniska Hogskolan; **Stockholm, Sweden**; June 2000. (1 hour)

26. *Geometric Feature Extraction.* Fraunhofer Institut Graphische Datenverarbeitung (Computer Graphics), Department: Multimedia Systems and Image Processing; **Darmstadt, Germany**; December 1999. (1 hour)

27. *Adaptive Triangular Mesh Generation for an accurate 3D Geometric Modeling.* Faculty of Computer Science and Electrical Engineering, State University of Campinas; **Sao Paulo Brasil**; August 1999. (2 hours)

28. *Automatic Generation of 3D Geometric Models from Range Images.* Laboratoire d'Analyse et d'Architecture des systèmes–Centre National de la Recherche Scientifique; **Toulouse, France**; July 1999. (2 hours)

29. *Generación automática de modelos 3D a partir de mapas de profundidad.* Engineering School; Universidad Nacional de La Pampa; **La Pampa, Argentina**; June 21st 1999. (3 hours)

Attendance to Courses and Seminars

1. *Ciclo Básico II de Formación Docente*, Escuela Superior Politécnica del Litoral (ESPOL); **Guayaquil, Ecuador**; May-November 2015. (174 hours)

2. *Project Cycle Management and Project Management*, Paragon Project Partners; **Guayaquil, Ecuador**; June 2015. (20 hours)

3. *Programa de Generació d'Idees 2012*, Autonomoous University of Barcelona; **Barcelona, Spain**; June 2012. (8 hours)

4. *Summer School on New Trends in Pattern Recognition for Motion Analysis*, Computer Vision Center; **Bellaterra, Barcelona, Spain**; July 7-11 2008. (40 hours)

5. *Croucher Advanced Study Institute on Biometric Authentication*, Hong Kong Baptist University; **Hong Kong**; 6-11 December 2004. (48 hours)

6. *Seminario de Automatización y Robótica en la Producción I*, Universidad Tecnológica Nacional; **Córdoba, Argentina**; May 1995. (18 hours)

7. *Cursos del Master y Doctorado en: "Diseño, Robótica y Automatización Industrial"*, Universidad de Murcia; **Murcia, Spain**; January- February 1995 (total 92 hours):

   - Automatización de sistemas de eventos discretos (20 hours)
   - Comunicaciones Industriales (24 hours)
   - Robótica Industrial (28 hours)
   - Sistemas de Almacenamiento y Transporte (20 hours)

8. *Elementos para la Automatización de Procesos de Manufactura, KVA, BITS & CHIPS '93*, Congreso Nacional de Estudiantes de Electricidad, Electrónica y Computación; **San Miguel de Tucumán, Argentina**; September 1993. (40 hours)

9. *Jornadas de Actualización para Profesores de Dibujo Técnico*, Instituto Argentino de Racionalización de Materiales (IRAM); **Buenos Aires, Argentina**; July 1992. (52 hours)

Conference Chair and Co-Chair

- **Special Session Chair**, "Advanced Visual Perception in Robotics", International Conference on Image Analysis and Recognition, Póvoa de Varzim, Portugal, July 2016.

- **Special Session Chair**, "Autonomous Driving and Driver Assistance Systems", ROBOT' 2015, Lisbon, Portugal, November 2015.

- **Conference Chair**, International Conference on Computer Graphics and Imaging, Crete, Greece, June 2012.

- **Conference Chair**, International Conference on Computer Graphics and Imaging, Innsbruck, Austria, February 2010.

- **Program Chair**, International Conference on Visualization, Imaging, and Image Processing, Palma de Mallorca, Spain, September 2008.

- **Program Chair**, International Conference on Visualization, Imaging, and Image Processing, Palma de Mallorca, Spain, August 2007.

- **Program Co-Chair**, International Conference on Visualization, Imaging, and Image Processing, Palma de Mallorca, Spain, August 2006.

- **Program Co-Chair**, International Conference on Visualization, Imaging, and Image Processing, Palma de Mallorca, Spain, August 2005.

Participation in International Program Committees

- Executive Editor: Electronic Letters on Computer Vision and Image Analysis **2012-to present**.

- IEEE Intelligent Vehicles symposium: **June 2010** (San Diego CA, USA).

- IEEE Int. Conference on Intelligent Transportation Systems: **September 2010** (Madeira, Portugal).

- IEEE Int. Conference on Intelligent Computing: **August 2014** (Taiyuan, China) / **July 2013** (Nanning, China) / **July 2012** (Huangshan, China) / **August 2011** (Zhengzhou, China) / **August 2010** (Changsha, China) / **September 2009** (Ulsan, Korea) / **September 2008** (Shanghai, China) / **August 2007** (Qing Dao, China).

- IEEE Int. Conf. on Signal-Image Technology & Internet-Based Systems: **23-27th November 2015** (Bangkok - Thailand) / **23-27th November 2014** (Marrakech - Marocco) / **2-5th December 2013** (Kyoto - Japan) / **Nov. 25th-29th 2012** (Naples - Italy) / **Nov. 28th-Dec. 1st 2011** (Dijon - France) / **15-18th-December 2010** (Kuala Lumpur, Malaysia) / **Nov. 29th-Dec. 4th 2009** (Marrakesh, Marocco) / **Nov. 30th-Dec. 3rd 2008** (Bali, Indonesia) / **December 2007** (Shanghai, China).

- IEEE Int. Conf. on Intelligent Computer Communication and Processing: **September 2015** (Cluj-Napoca, Romania) / **September 2014** (Cluj-Napoca, Romania) / **September 2013** (Cluj-Napoca, Romania) / **August-September 2012** (Cluj-Napoca, Romania) / **August 2011** (Cluj-Napoca, Romania) / **August 2010** (Cluj-Napoca, Romania) / **August 2009** (Cluj-Napoca, Romania).

- IEEE Int. Conf. on Machine and Web Intelligence: **October 2010** (Algiers, Algeria).

- Int. Conf. on Image Analysis and Recognition: **July 2016** (Póvoa de Varzim, Portugal) / **October 2014** (Algarve, Portugal) / **June 2013** (Póvoa de Varzim, Portugal) / **June 2012** (Aveiro, Portugal) / **June 2011** (Burnaby, Canada) / **June 2010** (Póvoa de Varzim, Portugal) / **July 2009** (Halifax, Canada) / **June 2008** (Póvoa de Varzim, Portugal).

- Int. Workshop on Computer Image and its Applications: **June 2012** (Vancouver, Canada).

- Int. Workshop on Computer Vision in Vehicle Technology: From Earth to Mars: **June 2015** (Boston, USA) / **July 2014** (Zurich, Switzerland) / **December 2013** (Sydney, Australia) / **October 2012** (Firenze, Italy).

- Chilean Workshop on Pattern Recognition: **Nov. 2014** (Talca, Chile) / **Nov. 2013** (Temuco, Chile) / **Nov. 2012** (Valparaíso, Chile) / **Nov. 2011** (Pucon, Chile) / **Nov. 2010** (Antofagasta, Chile) / **Nov. 2009** (Santiago de Chile, Chile).

- Int. Conf. on Pattern Recognition Systems: **April 2016** (Talca, Chile).

- Int. Symposium on Programming and Systems: **May 2009** (Algiers, Algeria).

- Int. Conf. on Industrial Computer Science: **September 2005** (Rosario, Argentina).

- Int. Conf. on Visualization, Imaging, and Image Processing: **September 2004** (Marbella, Spain).

- Iberoamerican Congress on Pattern Recognition: **November 2013** (Havana, Cuba).

- Conference of the Spanish Association for Artificial Intelligence: **September 2016** (Salamanca, Spain) / **November 2015** (Albacete, Spain) / **September 2013** (Madrid, Spain) / **November 2011** (Tenerife, Spain).

- Int. Conf. on Computer Graphics and Imaging: **February 2013** (Innsbruck, Austria) / **February 2008** (Innsbruck, Austria) / **February 2007** (Innsbruck, Austria) / **August 2005** (Honolulu, USA) / **August 2004** (Kauai, USA) / **August 2003** (Honolulu, USA).

- Int. Conf. on Imaging and Signal Processing in Health Care and Technology: **May 2012** (Baltimore, USA) / **May 2011** (Washington, DC, USA).

- Int. Conf. on Computer Vision: **June 2011** (Vancouver, Canada).

- Int. Conf. on Robotics and Control Systems: **August 2016** (Chengdu, China).

- Int. Conf. on Computational Modeling of Objects Presented in Images: Fundamentals, Methods, and Applications, **May 2010** (Buffalo-Niagara, USA).

- Int. Conf. on Autonomous Robot Systems and Competitions: **May 2016** (Bragança, Portugal) / **April 2015** (Vila Real, Portugal) / **April 2014** (Espinho, Portugal) / **April 2013** (Lisbon, Portugal) / **April 2012** (Guimarães, Portugal) / **April 2011** (Lisbon, Portugal).

- Int. Workshop on Intelligent Transportation Systems and Applications: **June 2011** (Crete, Greece).

- Int. Workshop on Combinatorial Image Analysis: **November 2015** (Kolkata, India) / **May 2014** (Brno, Czech Republic) / **November 2012** (Texas, USA) / **May 2011** (Madrid, Spain).

- Int. Conf. on Advanced IT, engineering and Management (FTRA AIM Summer 2012) **July 2012** (Jeju, Korea).

- Int. Conf. on Advances in Multimedia: **February 2016** (Lisbon, Portugal) / **June 2015** (Barcelona, Spain).

- Mexican Conf. on Pattern Recognition: **June 2015** (Mexico City, Mexico) / **June 2014** (Cancun, Mexico) / **June 2013** (Querétaro, Mexico).

- Int. Conf. on Multimedia and Ubiquitous Engineering: **April 2016** (Beijing, China) / **May 2015** (Hanoi, Vietnam) / **May 2014** (Zhangjiajie, China) / **May 2013** (Daegu, Korea).

- Int. Conf. on Information Visualization Theory and Applications: **February 2016** (Rome, Italy) / **March 2015** (Berlin, Germany) / **January 2014** (Lisbon, Portugal).

- 3rd ACM Int. Regular and Data Challenge Workshop on Multimedia Analysis for Ecological Data (MAED 2014) **November 2014** (Florida, USA).

Others

- **Co-founder of "Crowdmobile S.L."**: a spin off company of the Computer Vision Center devoted to crowdsourcing applications using mobile devices (from computer vision to sentiment analysis), **December 2013** (Barcelona, Spain).

- **Advisory Committee**: International Conference on Applied Information and Communications Technology, **April 2014** (Muscat, Oman).

- **Steering Committee**: IEEE International Conference on on Big Data and Smart City, **March 2016** (Muscat, Oman).

- **CEAACES Evaluator**: Member of the evaluation board for "Evaluación, Acreditación y Recategorización de Universidades y Escuelas Politécnicas", **November-December 2015** (Quito, Ecuador).

- **Faculty Position Reviewer**:

  – Tenure and promotion to Associate Professor in the School of Industrial Engineering at Purdue University, August 2014 (Purdue, USA).

  – Associate Professor, Inintelligent Processing of Visual Information, Faculty of Engineering and Science at Aalborg University, April 2015 (Copenhague, Denmark).

- **Reviewer of Research Project Proposals for**:

  – The Research Council (TRC) of the Sultanate of Oman, Al-Athaiba-Muscat, **Sultanate of Oman**.

  – Dutch Technology Foundation STW, Utrecht, **The Netherlands**.

  – Agencia Nacional de Evaluación y Prospectiva (ANEP), Madrid, **Spain**.

  – Secretaría de Educación Superior, Ciencia, Tecnología e Innovación (SENESCYT), Quito, **Ecuador**.

  – Agencia Nacional de Promoción Científica y Técnica (ANPCyT), Buenos Aires, **Argentina**.

- **Award**: 2nd. prize in the "Idea Generation 2012" (competition of the Autonomous University of Barcelona for enterprising)

- **PhD thesis board**:

  – Lounis Chermak; Cranfield University. Subject: "Standalone and Embedded Stereo Visual Odometry based Navigation Solution", September 2014 (Cranfield, UK).

  – Javier Mateo Prous; Computer Science Department, Engineering School, Autonomous University of Barcelona. Subject: "Algorithms for the Multiple Variants of Registration in 3D Range Data", November 2013 (Barcelona, Spain).

  – Pablo De Cristóforis; Faculty of Exact and Natural Sciences, University of Buenos Aires. Subject: "Sistema de navegación monocular para robots móviles en ambientes interiores/exteriores", March 2013 (Buenos Aires, Argentina).

  – Diego Cheda; Computer Science Department, Engineering School, Autonomous University of Barcelona. Subject: "Monocular Depth Cues in Computer Vision Applications", December 2012 (Barcelona, Spain).

- Iker Zuriarrain; Engineering School, University of Mondragon. Subject: "Methods for the Implementation of Computer Vision Algorithms in FPGA-based Smart Cameras", September 2012 (Mondragon, Spain).

- Ariel Amato; Computer Science Department, Engineering School, Autonomous University of Barcelona. Subject: "Environment-Independent Moving Cast Shadow Suppression in Video Surveillance", March 2012 (Barcelona, Spain).

- Karim Hammoudi; Mathematics, Sciences and Technologies of Information and Communication, Paris-Est University. Subject: "Contributions to the 3D city modeling: - 3D polyhedral building model reconstruction from aerial images - 3D facade modeling from terrestrial 3D point cloud and images", December 2011 (Paris, France).

- Ferran Diego Andilla; Computer Science Department, Engineering School, Autonomous University of Barcelona. Subject: "Probabilistic Alignment of Video Sequences recorded by Moving Cameras", July 2011 (Barcelona, Spain).

- Luca Zappella; Department of Computer Architecture and Technology, University of Girona. Subject: "Manifold Clustering for Motion Segmentation", June 2011 (Girona, Spain).

- Rodrigo Moreno Serrano; Institute of Organization and Control of Industrial Systems, Polytechnic University of Catalonia. Subject: "Robust Perceptual Organization techniques for analysis of color images", November 2010 (Barcelona, Spain).

- Jaime Christian Meléndez Rodríguez; Computer Science and Mathematic Department, Rovira i Virgili University. Subject: "Supervised and Unsupervised Segmentation of Textured Images by Efficient Multi-level Pattern Classification", October 2010 (Tarragona, Spain).

- Ignasi Rius Ferrer; Computer Science Department, Engineering School, Autonomous University of Barcelona. Subject: "Motion Priors for Efficient Bayesian Tracking in Human Sequence Evaluation", July 2010 (Barcelona, Spain).

- Carles Fernández Tena; Computer Science Department, Engineering School, Autonomous University of Barcelona. Subject: "Understanding image sequences: the role of ontologies in cognitive vision", July 2010 (Barcelona, Spain).

- Ana Belén Moreno; Informatics School, Polytechnic University of Madrid. Subject: "Reconocimiento Facial Automático mediante Técnicas de Visión Tridimensional", July 2004 (Madrid, Spain).

- **Master thesis board**, Physics school, Autonomous University of Barcelona, "Sistemas de Visión Estereoscópica: un Análisis Experimental sobre la Redundancia de Datos", Manuel Espínola Estepa, July 2006, (Barcelona, Spain).

- **Master Thesis and Graduation Project boards**, Computer Science Department, Engineering School, Autonomous University of Barcelona, 2012/2011/2010/2009/2008/2007/2006 (Barcelona, Spain).

- **Member of both the Steering Committee and the Technical Board** of the "Multimodal Interaction in Pattern Recognition and Computer Vision" project, MEC CONSOLIDER-INGENIO 2010: MIPRCV (CSD2007-00018).

- **External advisor and collaborator** of the Intelligent Robotics and Computer Vision Group, Rovira i Virgili University, since June 2007 (Tarragona, Spain).

- **Technical Committee**, IEEE Int. Conf. on Image Processing: September 2016 (Phoenix, USA) / September 2015 (Québec City, Canada) / October 2014 (Paris, France) / September 2013 (Melbourne, Australia) / September-October 2012 (Florida, USA) / September 2011 (Brussels, Belgium) / September 2010 (Hong Kong) / November 2009 (Cairo, Egypt) / October 2008 (San Diego, California, USA) / September 2007 (San Antonio, Texas, USA) / October 2006 (Atlanta, USA) / September 2005 (Genova, Italy) / October 2004 (Singapur).

- **Associate Editor**, IEEE Int. Conf. on Intelligent Transportation Systems, October 2011 (Washington DC, USA).

- **Technical Committee**, International Multi-Conference on Automation, Control, and Information Technology-Signal and Image Processing, June 2005 (Novosibirsk, Russia).

- **Journal Reviewer**:

  - IEEE Transactions on Image Processing (2014/2011/2008/2007/2006/ 2005).
  - IEEE Transactions on Intelligent Transportation Systems (2012/2011/2010/2009/2008/ 2007/2006).
  - IEEE Transactions on System, Man, and Cybernetics (Part B) (2007/2006/2005/ 2004/2003).
  - IEEE Transactions on Pattern Analysis and Machine Intelligence (2014/2013/2011).
  - IEEE Transactions on Multimedia (2011/2009).
  - IEEE Robotics and Automation Magazine (2013/2012).
  - Elsevier, Computer Vision and Image Understanding (2014).
  - Elsevier, Pattern Recognition (2007).
  - Elsevier, Pattern Recognition Letters (2011/2010/2009/2006/2005).
  - Elsevier, Image and Vision Computing Journal (2008/2007).
  - Elsevier, Aerospace Science and Technology (2011).
  - Elsevier, Infrared Physics and Technology (2016/2015).
  - Springer, Multimedia Tools and Applications (2014).
  - Springer, Journal of Mathematical Imaging and Vision (2008/2007).
  - Springer, Journal of Real-Time Image Processing (2013/2010/2009).
  - SPIE, Electronic Imaging (2012/2011/2008/2007).
  - Electronic Letters on Computer Vision and Image Analysis (2012/2007/2006/2005/2004).
  - Journal of Multimedia Processing and Technologies (2011).
  - Journal of Optical Society of America A (2012).
  - EURASIP Journal on Advances in Signal Processing (2008/2004).
  - IET Image Processing Journal (2008/2007).
  - Int. Journal of Pattern Recognition and Artificial Intelligence (2010/2009).
  - MDPI Sensors (2015/2011/2010).
  - IEEE Sensors Journal (2015).
  - Hindawi Jorunal of Sensors (2015).
  - Hindawi International Journal of Distributed Sensor Networks (2014).

- Integrated Computer-Aided Engineering Journal (2015).
  - Latin American Applied Research (2008).
  - Ingeniare, Revista Chilena de Ingeniería (2014).

- **Conference Reviewer**:

  - IEEE Intelligent Vehicles Symposium: **June 2013** (Gold Coast City, Australia) / **June 2012** (Alcalá de Henares, Spain).

  - IEEE Int. Conf. on Robotics and Automation: **May 2013** (Karlsruhe, Germany) / **May 2011** (Shanghai, China) / **May 2009** (Kobe, Japan) / **May 2008** (Pasadena, California, USA) / **April 2007** (Roma, Italy).

  - IEEE Int. Conf. on Intelligent Robots and Systems: **November 2013** (Tokyo, Japan) / **November 2010** (Taipei, Taiwan) / **October 2009** (St. Louis, MO, USA) / **Oct.-Nov. 2007** (San Diego, California, USA).

  - IEEE Int. Conf. on Intelligent Transportation Systems: **Septmber 2015** (Canarias, Spain) / **October 2014** (Qingdao, China) / **October 2013** (The Hague, The Netherlands) / **October 2009** (St. Louis, MO, USA) / **October 2008** (Beijing, China).

  - IEEE Int. Conf. on Intelligent Computing: **August 2014** (Taiyuan, China) / **August 2006** (Kunming, China).

  - IEEE Int. Symposium on Robot and Human Interactive Communication (RO-MAN): **August 2013** (Gyeongju, Korea).

  - Asian Conference on Computer Vision: **November 2014** (Singapore) / **November 2012** (Daejeon, Korea) / **November 2010** (Queenstown, New Zealand) / **September 2009** (Xi'an, China).

  - Int. Conf. on Multimodal Interfaces and Workshop on Machine Learning for Multimodal Interaction **November 2009** (Cambridge, MA, USA).

  - Int. Conf. on Pattern Recognition **August 2014** (Stockholm, Sweden).

- **Sponsored by The Croucher Foundation** to the "Recent Development on Biometric Authentication Lectures", held at the Hong Kong Baptist University, 6-11 December 2004, Hong Kong.

- Member of SigVision group (Special interest group in computer Vision), LAAS-CNRS, Toulouse, France, 1999/01.

- Senior Member of IEEE.

**Fortegnelse over bedømmelsesudvalg til
stilling Assistant Professor in Energy Planning (201714) ved PLAN**

Navn: Professor mso Brian Vad Mathiesen
Arbejdssted: PLAN, AAU
E-mail: bvm@plan.aau.dk

Navn: Professor Martin O.W. Greiner
Arbejdssted: Aarhus University, Department of Engineering
E-mail: greiner@eng.au.dk

Akademisk Råd har taget stilling til, at medlemmer af bedømmelsesudvalget er sagkyndige inden for stillingsområdet på et niveau, der mindst svarer til det, der forudsættes for stillingen, dog ikke under lektorniveau.

Assistant Professor in Energy Planning (201714)

Position No.
201714

At Technical Faculty of IT and Design, Department of Planning, Copenhagen a position as Assistant Professor in Energy Planning is open for appointment from August 15, 2017. The position is available for period of 4 years.

The Department of Development and Planning conducts research and teaching on development and planning in a broad sense, including social science aspects as well as more technical aspects of development, and with a focus on environmental, international as well as administrative dimensions.

Job description
In the projects, RE-INVEST and CORE we are opening a position within energy planning with research focused on energy system analyses. In addition, the position includes teaching obligations on relevant bachelor and master level programs. The purpose of the position is to develop state-of-the-art methodologies and to conduct advanced energy system analyses on an international and national level, as well as in a transition to 100% renewable energy. Focus is on interconnections and energy storage as well as sector integration and smart energy systems. Key competences for the positions is:

- Experience in energy system modelling on the EnergyPLAN tool is required (preferably as part of a finished PhD position)
- Experience in programing and tool development is an advantage
- Experience in modelling integrated smart energy systems (electricity, heat and gas) is a requirement
- Strong analytical skills and previous project management experience are advantages
- Ability to work independently with the overall project targets

The position is offered in Copenhagen. The tasks are conducted in close collaboration with key RE-INVEST partners (www.reinvestproject.eu) financed by Innovation Fund Denmark as well as partners in the CORE project financed by ForskEL/EUDP.

You may obtain further professional information from Brian Vad Mathiesen bvm@plan.aau.dk , Phone: 99401 7218

Qualification requirements:

Appointment as an Assistant Professor presupposes scientific qualifications at PhD-level or similar scientific qualifications. The research potential of each applicant will be emphasized in the overall assessment. Appointment as an Assistant Professor cannot exceed a period of four years in total at Aalborg University in a temporary position (appointment at Assistant Professor level cannot exceed a period of eight years in total in Denmark). The application must contain the following:

- A statement outlining your reasons for applying, and intentions and visions with, the position.
- Your curriculum vitae, including personal data, educational background, scientific qualifications, dissemination skills, participation in committees and boards, and additional qualifications relevant for the position.
- Copies of relevant diplomas (Master of Science and PhD). On request you could be asked for an official English translation.
- A complete list of publications.
- Publications you wish to be considered by the assessment committee. You may attach up to 5 publications.
- A specification of your teaching qualifications relative to the teaching portfolio. If this is not enclosed you must include an explanation for its absence.
- References/recommendations.

An assessment committee will assess all candidates. The applications are only to be submitted online by using the "Apply online" button below.

For further information concerning the application procedure please contact Nickie Hermansen by mail nkh@adm.aau.dk or phone (+45) 9940 7902 Information regarding

guidelines, ministerial circular in force, teaching portfolio and procedures can be seen here.

Workplace
Aalborg

Agreement
Employment is in accordance with the Ministerial Order on the Appointment of Academic Staff at Universities (the Appointment Order) and the Ministry of Finance's current Job Structure for Academic Staff at Universities. Employment and salary are in accordance with the collective agreement for state-employed academics.

Deadline
19/05/2017

Apply online

Aalborg University (AAU) conducts teaching and research to the highest level in the fields of humanities, engineering, and natural, health, and social sciences.

top

Curriculum Vitae

Name		Martin Greiner
Age		54
Appointment		Professor
Place of Work		Department of Engineering, Aarhus University Inge Lehmans Gade 10, DK-8000 Aarhus C, Denmark Tel: +45 2149 1002, Email: greiner@eng.au.dk
Education	1995 1990 1987	Habilitation (Theoretical Physics), JLU, Giessen, Germany PhD (Theoretical Physics), Justus Liebig University. MSc (Theoretical Physics), Justus Liebig University.
Appointments	2010 - 2001 - 2010 2000 - 2001 1995 - 2000 1993 - 1995 1991 - 1993	Professor, System Engineering, Department of Engineering, Aarhus University, Denmark. Senior Research Scientist, Corporate Research and Technology, Siemens AG, Munich, Germany. Visiting Professor, Duke University, Durham, USA. Research Scientist, Technical Universtiy and Max-Planck Institute for Physics of Complex Systems, Dresden, Germany. Post-doctoral fellow, Justus Liebig University, Giessen, Germany. Post-doctoral fellow, University of Arizona, Tucson, USA.
Scientific papers, patents and contributions		ca. 80 articles in refereed international journals, ca. 55 papers in mostly refereed international proceedings, uncountable number of invited conference talks, colloquia and seminars.
Research		Current fields of interests include

- Large-scale renewable energy systems: modelling, design and planning of sustainable energy systems and markets with a large share of variable renewable energy sources.
- Turbulence, wind flows, modelling + optimization + control of wind farms.
- Physics and mathematics of complex networks: applications ranging from communication and electricity networks to social and biological networks.

With strong experiences both in academic and industrial cooperate research, the research competences range from very fundamental to very applied, and reflect a unique understanding of both ends.

Publications (selected)

D Heide et.al.: *Seasonable optimal mix of wind and solar power in a future, highly renewable Europe*, Renewable Energy 35 (2010) 2483-2489.

MG Rasmussen et.al.: *Storage and balancing synergies in a fully or highly renewable pan-European power system*, Energy Policy 51 (2012) 642-651.

S Becker et.al.: *Transmission grid extensions during the build-up of a fully renewable pan-European electricity supply*, Energy 64 (2014) 404-418.

RA Rodriguez et.al.: *Cost-optimal design of a simplified, highly renewable pan-European electricity system*, Energy 83 (2015) 658-668.

B Tranberg et.al.: *Power flow tracing in a simplified highly renewable European electricity network*, New J. Physics 17 (2015) 105002.

PUBLICATIONS (Martin Greiner)

Renewable Energy Networks
Wind Energy
Complex Networks
Turbulence
Wavelets in Statistical Physics
Exotic Particle Production in Ultrarelativistic Heavy-Ion Collisions
Collective Nuclear Structure Models and Group Theory
Radioactive Cluster Decay

Renewable Energy Networks

Journal Articles

D.P. Schlachtberger, S. Becker, S. Schramm, M. Greiner:
Backup flexibility classes in emerging large-scale renewable electricity systems,
Energy Conversion and Management 125 (2016) 336-46.

B. Tranberg, A.B. Thomsen, R.A. Rodriguez, G.B. Andresen, M. Schäfer, M. Greiner:
Power flow tracing in a simplified highly renewable European electricity network,
New Journal of Physics 17 (2015) 105002.

G.B. Andresen, A.A. Søndergaard, M. Greiner:
Validation of Danish wind time series from a new global renewable energy atlas for energy system analysis,
Energy 93 (2015) 1074-88.

R.A. Rodriguez, S. Becker, M. Greiner:
Cost-optimal design of a simplified, highly renewable pan-European electricity system,
Energy 83 (2015) 658-68.

R.A. Rodriguez, M. Dahl, S. Becker, M. Greiner:
Localized vs. synchronized exports across a highly renewable pan-European transmission network,
Energy, Sustainability and Society 5 (2015) 21.

S. Becker, B.A. Frew, G.B. Andresen, M.Z. Jacobson, S. Schramm, M. Greiner:
Renewable build-up pathways for the US: Generation costs are not system costs,
Energy 81 (2015) 437-45.

G.B. Andresen, R.A. Rodriguez, S. Becker, M. Greiner:
The potential for arbitrage of wind and solar surplus power in Denmark,
Energy 76 (2014) 49-58.

S. Becker, B.A. Frew, G.B. Andresen, T. Zeyer, S. Schramm, M. Greiner, M.Z. Jacobson:
Features of a fully renewable US electricity system: Optimized mixes of wind and solar PV and transmission grid extensions,
Energy 72 (2014) 443-58.

T.V. Jensen, M. Greiner:
Emergence of a phase transition for the required amount of storage in highly renewable electricity systems,
Eur. Phys. J. Special Topics 223 (2014) 2475-81.

S. Becker, R.A. Rodriguez, G.B. Andresen, S. Schramm, M. Greiner:
Transmission grid extensions during the build-up of a fully renewable pan-European electricity supply,

Energy 64 (2014) 404-18.

R.A. Rodriguez, S. Becker, G.B. Andresen, D. Heide, M. Greiner:
Transmission needs across a fully renewable European power system,
Renewable Energy 63 (2014) 467-76.

M.G. Rasmussen, G.B. Andresen, M. Greiner:
Storage and balancing synergies in a fully or highly renewable pan-European power system,
Energy Policy 51 (2012) 642-51.

D. Heide, M. Greiner, L. von Bremen, C. Hoffmann:
Reduced storage and balancing needs in a fully renewable European power system with excess wind and solar power generation,
Renewable Energy 36 (2011) 2515-23.

D. Heide, L. von Bremen, M. Greiner, C. Hoffmann, M. Speckmann, S. Bofinger:
Seasonal optimal mix of wind and solar power in a future, highly renewable Europe,
Renewable Energy 35 (2010) 2483-9.

Wind Energy

Journal Articles

J. Herp, U. Poulsen, M. Greiner:
Wind farm power optimization including flow variability,
Renewable Energy 81 (2015) 173-181.

J. Cleve, M. Greiner, P. Enevoldsen, B. Birkemose, L. Jensen:
Model-based analysis of wake-flow data in the Nysted offshore wind farm,
Wind Energy 12 (2009) 125-35.

Complex Networks

Journal Articles

J. Scholz, M. Greiner:
Self-organizing weights for Internet AS-graphs and surprisingly simple routing metrics,
EPL 94 (2011) 28008.

J. Scholz, W. Krause, M. Greiner:
Decorrelation of networked communication flow via load-dependent routing weights,
Physica A 387 (2008) 2987-3000.

D. Heide, M. Schäfer, M. Greiner:
Robustness of networks against fluctuation-induced cascading failures,
Phys. Rev. E 77 (2008) 056103.

J. Scholz, M. Greiner:
Topology control with IPD network creation games,
New Journal of Physics 9 (2007) 185.

M. Kuhnt, I. Glauche, M. Greiner:
Impact of observational incompleteness on the structural properties of protein interaction networks,
Physica A 373 (2007) 759-69.

M. Schäfer, J. Scholz, M. Greiner:
Proactive robustness control of heterogeneously loaded networks,
Phys. Rev. Lett. 96 (2006) 108701.

R. Sollacher, M. Greiner, I. Glauche:
Impact of interference on the wireless ad hoc networks capacity and topology,
Wireless Communication 12 (2006) 53-61.

W. Krause, J. Scholz, M. Greiner:
Optimized network structure and routing metric in wireless multihop ad hoc communication,
Physica A 361 (2006) 707-723.

J. Scholz, M. Dejori, M. Stetter, M. Greiner:
Noisy scale-free networks,
Physica A 350 (2005) 622-642.

I. Glauche, W. Krause, R. Sollacher, M. Greiner:
Distributive routing & congestion control in wireless multihop ad hoc communication networks,
Physica A 341 (2004) 677-701.

W. Krause, I. Glauche, R. Sollacher, M. Greiner:
Impact of network structure on the capacity of wireless multihop ad hoc communication,
Physica A 338 (2004) 633-658.

I. Glauche, W. Krause, R. Sollacher, M. Greiner:
Continuum percolation of wireless ad hoc communication networks,
Physica A 325 (2003) 577-600.

Conference Articles

W. Krause, R. Sollacher, M. Greiner:
Self-* topology control in wireless multihop ad hoc communication networks,
Int. Workshop on SELF-STAR: Self-* Properties in Complex Information Systems, Bologna, May 31 - June 2, 2004,
eds. O. Babaoglu, M. Jelasity, A. Montresor, C. Fetzer, S. Leonardi, A. van Moorsel and M. van Steen,
Springer Lecture Notes in Computer Science, Self-star Properties in Complex Information Systems: Conceptual and Practical Foundations, Vol. 3460 (2005) pp. 49-62.

W. Krause, I. Glauche, R. Sollacher, M. Greiner:
Towards a Selforganized Control of Wireless Multihop Ad Hoc Communication Networks,
ARCS 2004 – Organic and Pervasive Computing, Workshop on Self Organization in Physics and Computer Science, Augsburg, March 26, 2004,
eds. U. Brinkschulte, J. Becker, D. Fey, K. Großpietsch, C. Hochberger, E. Maehle and T. Runkler,
Gesellschaft für Informatik (2004) pp. 283-290.

W. Krause, I. Glauche, R. Sollacher, M. Greiner:
Selforganization in Communication Networks and beyond,
Idea-Finding Symposium of the Frankfurt Institute for Advanced Studies, Frankfurt, April 15-17, 2003,
eds. W. Greiner and J. Reinhardt, EP Systema, Debrecen, Hungary (2004) pp. 103-116.

Turbulence

Journal Articles

J. Cleve, J. Schmiegel, M. Greiner:
Apparent scale correlations in a random multifractal process,
Eur. Phys. J. B 63 (2008) 109-16.

J. Cleve, T. Dziekan, J. Schmiegel, O.E. Barndorff-Nielsen, B.R. Pearson, K.R. Sreenivasan, M. Greiner:
Finite-size scaling of two-point statistics and the turbulent energy cascade generators,
Phys. Rev. E 71 (2005) 026309 (12 pages).

J. Cleve, M. Greiner, B.R. Pearson, K.R. Sreenivasan:
Intermittency exponent of the turbulent energy cascade,
Phys. Rev. E 69 (2004) 066316 (6 pages).

J. Schmiegel, J. Cleve, H. Eggers, B. Pearson, M. Greiner:
Stochastic energy-cascade model for 1+1 dimensional fully developed turbulence,
Phys. Lett. A 320 (2004) 247-253.

J. Cleve, M. Greiner, K.R. Sreenivasan:
On the surrogacy of the energy dissipation field in fully developed turbulence,
Europhys. Lett. 61 (2003) 756-761.

M. Greiner, B. Jouault:
An experimentalists view of discrete and continuous cascade models in fully developed turbulence,
Fractals 10 (2002) 321-327.

H. Eggers, T. Dziekan, M. Greiner:
Translationally invariant cumulants in energy cascade models of turbulence,
Phys. Lett. A 281 (2001) 249-255.

J. Cleve, M. Greiner:
The Markovian metamorphosis of a simple turbulent cascade model,
Phys. Lett. A 273 (2000) 104-108.

M. Wolf, J. Schmiegel, M. Greiner:
Artificiality of multifractal phase transitions,
Phys. Lett. A 266 (2000) 276-281.

B. Jouault, M. Greiner, P. Lipa:
Fix-point multiplier distributions in discrete turbulent cascade models,
Physica D 136 (2000) 125-144.

B. Jouault, P. Lipa, M. Greiner:
Multiplier phenomenology in random multiplicative cascade processes,

Phys. Rev. E 59 (1999) 2451-2454.

M. Greiner, J. Schmiegel, F. Eickemeyer, P. Lipa, H. Eggers:
Spatial correlations of singularity strengths in multifractal branching processes,
Phys. Rev. E 58 (1998) 554-564.

M. Greiner, H. Eggers, P. Lipa:
Analytic multivariate generating function for random multiplicative cascade processes,
Phys. Rev. Lett. 80 (1998) 5333-5336.

M. Greiner, J. Giesemann, P. Lipa:
Translational invariance in turbulent cascade models,
Phys. Rev. E 56 (1997) 4263-4274.

Conference Articles

M. Greiner, J. Cleve, J. Schumacher, K.R. Sreenivasan:
Observational impact of surrogacy on the turbulent energy cascade,
iTi Conference on Turbulence, Bad Zwischenahn, September 21-24, 2003,
in: Progress in Turbulence, eds. J. Peinke, A. Kittel, S. Barth and M. Oberlack, Springer Proceedings in Physics, Vol. 101, Springer, Berlin (2005) pp. 55-58.

M. Greiner, J. Cleve, J. Schmiegel, K.R. Sreenivasan:
Data-driven stochastic processes in fully developed turbulence,
IMA 2003 Summer Program: Probability and Partial Differential Equations in Modern Applied Mathematics, Minneapolis, USA, Juli 21 - August 1, 2003,
in: Probability and Partial Differential Equations in Modern Applied Mathematics, eds. E.C. Waymire and J. Duan, IMA Volumes in Mathematics and its Applications, Vol. 140, Springer, New York (2005) pp. 137-150.

J. Cleve, M. Greiner:
News about the intermittency exponent,
IUTAM Symposium on Reynolds Number Scaling in Turbulent Flow, Princeton, USA, September 11-13, 2002,
ed. A.J. Smits, Kluwer Academic publishers (2003) pp. 245-248.

M. Greiner:
Turbulent random multiplicative branching processes,
Workshop on Multiscale and Multiplicative Processes in Fluid Flows, Aarhus, Denmark, August 23-28, 2001,
MaPhySto Lecture Notes 11 (August 2002) pp. 81-88.

M. Greiner:
Spatial statistics of a turbulent random multiplicative branching process,
Workshop on Spatial Statistics – Statistical Physics, Wuppertal, March 5-8, 2001.

H.C. Eggers, M. Greiner:
Cumulant ratios in fully developed turbulence,

Proceedings of the IX-th International Workshop on Multiparticle Production, Torino, June 11-18, 2000,
eds. A. Giovannini and R. Ugoccioni, Nuclear Physics B Supplement.

B. Jouault, J. Schmiegel, M. Greiner, P. Lipa:
Wavelet multiplier correlations in turbulent cascades,
Int. Workshop on Self-similar Systems, Dubna, Russia, July 30 - August 7, 1998,
eds. V.B. Priezzhev and V.P. Spiridonov, JINR, Dubna (1999) pp. 83-87.

H.C. Eggers, M. Greiner, P. Lipa:
Analytical solution for multivariate statistics in random multiplicative cascades,
8-th International Workshop on Multiparticle Production, Correlations and Fluctuations'98: from QCD to particle interferometry, Matrahaza (Ungarn), June 14-21, 1998,
eds. T. Csörgő, S. Hegyi, R.C. Hwa and G. Jancso, World Scientific (1999) pp. 264-271.

M. Greiner, P. Lipa, J. Giesemann:
Turbulent cascades,
Workshop on The State of Physics at the End of the 20th Century: in honor of Peter Carruthers, Santa Fe (USA), Oct. 1996,
eds. F. Cooper, I. Sarcevic, C.-I. Tan and G. West, World Scientific, Singapore (1999) pp. 101-110.

Wavelets in Statistical Physics

Journal Articles

M. Greiner, B. Jouault, J. Schmiegel, J. Giesemann, P. Lipa, H. Eggers:
Wavelets – from signal analysis to the analysis of complex processes,
Rev. Mex. Fis. 44, S2 (1998) 11-14.

J. Pando, P. Lipa, M. Greiner, L.-Z. Fang:
Probing hierarchical clustering by scale-scale correlations of wavelet coefficients,
Astrophys. J. 496 (1998) 9.

A. Ludu, M. Greiner, J.P. Draayer:
Wavelets and quantum algebras,
J. Math. Phys. 39 (1998) 2346-2361.

J. Giesemann, M. Greiner, P. Lipa:
Wavelet cascades,
Physica A 247 (1997) 41-58.

P. Lipa, M. Greiner, P. Carruthers:
Introduction to wavelets and applications to correlation measurements,
Acta Phys. Slov. 46 (1996) 557.

M. Greiner, P. Lipa, P. Carruthers:
Wavelets – some applications in physics,
Complexity 2 (1996) 31.

H.E. Roman, J.W. Kantelhardt, M. Greiner:
Wavelets and multifractality – Application to Anderson localized wavefunctions,
Europhys. Lett. 35 (1996) 641.

M. Greiner, J. Giesemann, P. Lipa, P. Carruthers:
Wavelet-correlations in hierarchical branching processes,
Z. Phys. C 69 (1996) 305.

J.W. Kantelhardt, H.E. Roman, M. Greiner:
Discrete wavelet approach to multifractality,
Physica A 220 (1995) 219.

M. Greiner, P. Lipa, P. Carruthers:
Wavelet-correlations in the p-model,
Phys. Rev. E 51 (1995) 1948-1960.

Book Articles

M. Greiner, J. Giesemann:

Correlation structure of wavelet cascades,
in: Wavelets in Physics, eds. L.Z. Fang and R.L. Thews,
World Scientific, Singapore (1998), pp. 89-131.

Conference Articles

M. Greiner, J. Giesemann, R. Hetzel, P. Lipa:
Wavelets: probing hierarchical clustering in complex multiparticle processes,
European conference on Advances in Nuclear Physics and Related Areas, Thessaloniki (Greece),
July 8-12, 1997,
eds. D.M. Brink, M.E. Grypeos and S.E. Massen, Giahoudi-Giapouli Publishing, Thessaloniki
(1999) pp. 136-143.

M. Greiner, J. Giesemann, P. Lipa:
Wavelet correlations in complex multiparticle reactions,
8th International Conference on Nuclear Reaction Mechanisms, Varenna (Italy), June 9-14, 1997,
ed. E. Gadioli, Ricerca Scientifica ed Educazione Permanente, Supplemento n. 111 (1997) pp.
465-472.

M. Greiner, P. Lipa, J. Giesemann:
Wavelet-correlations in hierarchical cascade processes,
7th International Workshop on Multiparticle Production – Correlations and Fluctuations, Nijmegen
(Netherlands), July 1996,
eds. R.C. Hwa, W. Kittel, W.J. Metzger and D.J. Schotanus, World Scientific, Singapore (1997) p.
212.

M. Greiner, P. Lipa, J. Giesemann:
Wavelet-correlations in hierarchical cascade processes – The question of scaling and clustering in
complex reactions,
International Conference on Nuclear Physics at the Turn of the Millennium: Structure of Vacuum
and Elementary Matter, Wilderness (South Africa), March 1996,
eds. H. Stöcker, A. Gallmann and J.H. Hamilton, World Scientific, Singapore (1997) p. 604.

M. Greiner, P. Lipa, P. Carruthers, J. Giesemann:
Wavelet correlations in multiparticle cascades: A new approach to learn more about the evolution
dynamics,
XXV International Symposium on Multiparticle Dynamics, Stara Lesna (Slowakia), Sept. 1995,
eds. D. Bruncko, L. Sandor and J. Urban, World Scientific, Singapore (1996) p. 562.

M. Greiner, P. Lipa, P. Carruthers:
Wavelets: A new tool to study selfsimilarity and clustering in complex reactions,
CORINNE II: International Workshop on Multi-Particle Correlations and Nuclear Reactions, Nantes
(France), Sept. 1994,
eds. J. Aichelin and D. Ardouin, World Scientific, Singapore (1995) p. 449.

P. Lipa, M. Greiner, P. Carruthers:
Analysis of multiparticle correlations and the wavelet transform,

NATO Advanced Research Workshop Hot Hadronic Matter: Theory and Experiment, Divonne-les-Bains (France), June 1994.

M. Greiner, P. Lipa, P. Carruthers:
Wavelet correlations in selfsimilar cascades,
NATO Advanced Study Institute: Hot and Dense Nuclear Matter, Bodrum (Turkey), Oct. 1993,
eds. W. Greiner, H. Stöcker and A. Gallmann, Plenum Press, New York (1994) p. 265.

P. Carruthers, M. Greiner, P. Lipa:
Ideas on wavelet analyses applied to high energy physics,
XXIII International Symposium on Multiparticle Dynamics, Aspen (USA), Sept. 1993,
eds. M. Block and A. White, World Scientific, Singapore (1994) p. 281.

P. Lipa, M. Greiner, P. Carruthers:
Wavelet analysis of multiparticle correlations,
Cracow Workshop on Multiparticle Production, Cracow (Poland), May 1993,
ed. R.C. Hwa, World Scientific, Singapore (1994).

Exotic Particle Production in Ultrarelativistic Heavy-Ion Collisions

Journal Articles

F. Krauss, M. Greiner, G. Soff:
Photon and gluon induced processes in relativistic heavy-ion collisions,
Prog. Part. Nucl. Phys. 39 (1997) 503-564.

M. Vidović, M. Greiner, G. Soff:
New hunt for an intermediate mass Higgs boson in peripheral ultrarelativistic heavy-ion collisions,
Mod. Phys. Lett. A 10 (1995) 2471.

M. Vidović, M. Greiner, G. Soff:
Rapidity distributions of electromagnetically produced particles in peripheral ultrarelativistic heavy-ion collisions,
J. Phys. G: Nucl. Part. Phys. 21 (1995) 545.

M. Greiner, M. Vidović, C. Hofmann, A. Schäfer, G. Soff:
Deduction of the in-medium gluon distribution from photon-gluon fusion processes in peripheral ultrarelativistic heavy-ion collisions,
Phys. Rev. C 51 (1995) 911.

M. Greiner, M. Vidović, G. Soff, C. Best:
Exotic particle production via strong transverse electromagnetic fields,
Rev. Mex. Fis. 39, S2 (1993) 114.

M. Vidović, M. Greiner, G. Soff:
Electromagnetic dissociation of Pb nuclei in peripheral ultrarelativistic heavy-ion collisions,
Phys. Rev. C 48 (1993) 2011.

M. Greiner, M. Vidović, G. Soff:
Electromagnetic production of Higgs bosons, SUSY partices, glueballs and mesons in ultrarelativistic heavy-ion collisions,
Phys. Rev. C 47 (1993) 2288.

M. Vidović, M. Greiner, C. Best, G. Soff:
Impact-parameter dependence of the electromagnetic particle production in ultrarelativistic heavy-ion collisions,
Phys. Rev. C 47 (1993) 2308.

M. Greiner, D. Hilberg, C. Hofmann, G. Soff:
Production of Higgs bosons in central ultrarelativistic heavy-ion collisions,
J. Phys. G: Nucl. Part. Phys. 19 (1993) 261.

G. Soff, D. Hilberg, C. Hofmann, S. Schneider, M. Vidović, M. Greiner:
The production of Higgs bosons and Z^0 bosons in heavy-ion colliders,
Rev. Mex. Fis. 38, S2 (1992) 196.

M. Greiner, M. Vidović, J. Rau, G. Soff:
Impact-parameter dependence of the Higgs-boson production in ultrarelativistic heavy-ion collisions,
J. Phys. G: Nucl. Part. Phys. 17 (1991) L45.

Conference Articles

M. Vidovic, G. Soff, M. Greiner:
Coulomb dissociation of ^{208}Pb and ^{197}Au collisions,
XXXII Intenational Winter Meeting on Nuclear Physics, Bormio (Italy), Jan. 1994,
ed. I. Iori, Ricerca Scientifica ed Educazione Permanente, Supplemento n. 97 (1994) p. 371.

G. Soff, M. Vidovic, M. Greiner, S. Schneider, D. Hilberg:
Photon-induced processes in ultrarelativistic heavy-ion collisions,
NATO Advanced Study Institute: Hot and Dense Nuclear Matter, Bodrum (Turkey), Oct. 1993,
eds. W. Greiner, H. Stöcker and A. Gallmann, Plenum Press, New York (1994) p. 321.

M. Greiner, M. Vidovic, G. Soff:
Processes in peripheral ultrarelativistic heavy-ion collisions,
NATO Advanced Study Institute: Frontier Topics in Nuclear Physics, Predeal (Romania), Aug. 1993,
eds. W. Scheid and A. Sandulescu, Plenum Press, New York (1994) p. 447.

G. Soff, M. Vidović, S. Schneider, D. Hilberg, C. Hofmann, M. Greiner:
Particle production in high energy heavy-ion collisions,
Symposium on Nuclear Physics of Our Times, Sanibel Island (USA), Nov. 16-22, 1992,
ed. A.V. Ramayya, World Scientific, Singapore (1993) p. 498-506.

M. Greiner, M. Vidović, G. Soff:
Higgs boson production in ultrarelativistic heavy-ion collisions,
International Symposium on Nuclear Physics of Our Times, Sanibel Island (USA), Nov. 16-22, 1992,
ed. A.V. Ramayya, World Scientific, Singapore (1993) p. 489-497.

C. Hofmann, S. Schneider, M. Vidovic, C. Best, D. Hilberg, A. Schäfer, W. Greiner, M. Greiner, G. Soff:
Production of exotic particles in central and peripheral heavy-ion collisions,
XXX Intenational Winter Meeting on Nuclear Physics, Bormio (Italy), Jan. 1992,
ed. I. Iori, Ricerca Scientifica ed. Educazione Permanente, Supplemento n. 91 (1992) p. 406.

G. Soff, W. Michelbach, M. Greiner, M. Vidovic, C. Best, S. Schneider, D. Hilberg, C. Hofmann:
Ultrarelativistic heavy-ion collisions and the formation of new particles,
7th Adriatic International Conference on Nuclear Physics, Brioni (Yugoslavia), May 1991,
eds. R. Caplar and W. Greiner, World Scientific, Singapore (1991) p. 353.

M. Greiner, M. Vidovic, J. Rau, C. Hofmann, G. Soff:
Production of Exotic Particles in Ultrarelativistic Heavy-Ion Collisions,

Collective Nuclear Structure Models and Group Theory

Journal Articles

J. Schmiegel, M. Greiner, G. Soff:
Linearised collective Schrödinger equation and supersymmetry,
J. Phys. G: Nucl. Part. Phys. 25 (1999) L29-L33.

D. Heumann, E.D. Mshelia, G. Braunss, M. Greiner, W. Scheid:
Bargmann-Wigner equations in five-dimensional space,
Nuovo Cimento A 111 (1998) 477-491.

D. Heumann, M. Greiner, W. Scheid, G. Braunss:
Extension of the Spin-dependent Generalized Collective Model to even-odd nuclei with spin 1/2 and 5/2,
Int. J. Mod. Phys. E 3 (1994) 1203.

D. Heumann, M. Greiner, W. Scheid, G. Braunss:
The Spin-dependent Generalized Collective Model in relation to the j=3/2-IBFM,
Phys. Rev. C 50 (1994) 812.

D. Heumann, M. Greiner, W. Scheid:
Linearized collective Schrödinger equation with spin-dependent potentials for spin-3/2 nuclei and application to $^{187,189,191}Ir$,
Mod. Phys. Lett. A 6 (1991) 3653.

M. Greiner, D. Heumann, W. Scheid:
Spin-dependent potentials in the linearized collective Schrödinger equation for nuclear quadrupole vibrations,
Z. Phys. A: At. Nucl. 336 (1990) 139.

M. Greiner, W. Scheid:
The linearized Schrödinger equation for nuclear quadrupole surface vibrations,
Phys. Rev. C 42 (1990) 262.

R. Herrmann, G. Plunien, M. Greiner, W. Scheid:
Collective spin from the linearization of the Schrödinger equation in multi-dimensional Riemannian spaces used in collective nuclear models,
Mod. Phys. A 4 (1989) 4961.

H. Wu, M. Greiner, D. H. Feng:
Collective spin in nuclear dynamical symmetry,
Phys. Rev. C 39 (1989) 1059.

M. Greiner, W. Scheid, R. Herrmann:
Collective spin from the linearisation of $(2\lambda + 1)$-dimensional Schrödinger equations as used for nuclear surface vibrations,

J. Phys. A: Math. Gen. 21 (1988) 3227.

M. Greiner, W. Scheid, R. Herrmann:
Collective spin by linearization of the Schrödinger equation for nuclear collective motion,
Mod. Phys. Lett. A 3 (1988) 859.

Conference Articles

M. Greiner, D. Heumann, W. Scheid, G. Braunss, P. Hess:
Spin-dependent generalized collective model,
NATO Advanced Study Institute: Frontier Topics in Nuclear Physics, Predeal (Romania), Aug. 1993,
eds. W. Scheid and A. Sandulescu, Plenum Press, New York (1994) p. 217.

M. Greiner, D. Heumann, W. Scheid:
Linearised collective Schrödinger equation for nuclear quadrupole surface vibrations,
XIV Nuclear Physics Symposium, Oaxtepec (Mexico), Jan. 1991,
ed. M.E. Brandan, World Scientific, Singapore (1991) p. 85.

M. Greiner, D. Heumann, W. Scheid:
Linearised collective Schrödinger equation for nuclear quadrupole surface vibrations,
Summer School Recent Advances in Nuclear Structure, Predeal (Romania), Sept. 1990,
ed. D. Bucurescu, G. Cata-Danil and N.V. Zamfir, World Scientific, Singapore (1991) p. 289.

M. Greiner, W. Scheid:
The collective spin of nuclear surface vibrations,
NATO Advanced Study Institute, International Advanced Courses on The nuclear equation of state, Peniscola (Spain), May 1989,
eds. W. Greiner and H. Stöcker, Plenum Press, New York (1989) p. 533.

M. Greiner, W. Scheid:
The collective spin of nuclear surface vibrations,
XXVII International Winter Meeting on Nuclear Physics, Bormio (Italy), Jan. 1989,
ed. I. Iori, Ricerca Scientifica ed. Educazione Permanente, Supplemento n. 69 (1989) p. 8.

M. Greiner, W. Scheid, R. Herrmann:
Linearisation of the Schrödinger equation for nuclear surface vibrations and the collective spin,
Workshop on Microscopic Models in Nuclear Structure Physics, Oak Ridge (USA), Oct. 1988,
eds. B.M. Guidry et. al., World Scientific, Singapore (1989) p. 156.

M. Greiner, W. Scheid, R. Herrmann:
Linearisation of the Schrödinger equation for nuclear surface vibrations and the collective spin,
Summer School on Recent advances in nuclear physics, Poiana-Brasov (Romania), Sept. 1988,
eds. M. Petrovici and N. Zamfir, World Scientific, Singapore (1989) p. 213.

Radioactive Cluster Decay

Journal Articles

R. Gupta, M. Horoi, A. Sandulescu, M. Greiner, W. Scheid:
Cluster preformation probabilities and fine structure effects in heavy cluster decays using folding potentials,
J. Phys. G: Nucl. Part. Phys. 19 (1993) 2063.

M. Greiner, W. Scheid, V. Oberacker:
Coulomb-induced α-decay and cluster emission within the superasymmetric fission model for the collision of ^{238}U on ^{238}U,
J. Phys. G: Nucl. Phys. 14 (1988) 589.

M. Greiner, W. Scheid:
Radioactive decay into excited states via heavy ion emission,
J. Phys. G: Nucl. Phys. 12 (1986) L229.

Conference Articles

K. Depta, R. Herrmann, J.A. Maruhn, W. Greiner, M. Greiner, W. Scheid:
Nuclear Deformation, Cluster Structure, Fission and Cluster Radioactivity, A Unifying Point of View,
International Symposium on Nuclear Fission and Heavy Ion Induced Reactions, Rochester (USA), April 1986.

**Fortegnelse over bedømmelsesudvalg til
stilling P21709 Postdoc in Outcome Measures in adult hearing rehabilitation ved Department of
Electronic Systems**

Navn: Professor Dorte Hammershøi
Arbejdssted: Department of Electronic Systems, AAU
E-mail: dh@es.aau.dk

Navn: Associate Professor Rodrigo Ordoñez
Arbejdssted: Department of Electronic Systems, AAU
E-mail: rop@es.aau.dk

Akademisk Råd har taget stilling til, at medlemmer af bedømmelsesudvalget er sagkyndige inden for stillingsområdet på et niveau, der mindst svarer til det, der forudsættes for stillingen, dog ikke under lektorniveau.

Postdoc in Outcome Measures in adult hearing rehabilitation

Godkendt d. 27-4-17

Eskild Holm Nielsen
dekan

Position No.
P21709

At the Technical Faculty of IT and Design, Department of Electronic Systems a position as postdoc in Outcome Measures in adult hearing rehabilitaion is open for appointment from 1st June 2017 or soon thereafter. The position is available for a period of two years.

The position is part of the collaborative research program for Better Hearing Rehabilitation (BEAR), including University of Southern Denmark, The Danish Technical University, Odense, Aalborg and Copenhagen University Hospitals, DELTA a part of FORCE, Oticon, GN Resound and Widex. The project is funded by the Innovation Fund Denmark, and partners.

The Department of Electronic Systems is one of the largest departments at Aalborg University with a total of more than 250 employees. The department is internationally recognized in particular for its contributions within Information and Communication Technology (ICT). The research and teaching of the Department of Electronic Systems focus on electronic engineering and the activity areas are organized in the sections: Antennas, Propagation and Radio Networking section (APNet), Automation Control section (Control), Signal and Information Processing section (SIP), Wireless Communication Networks section (WCN) and Communication, Media and Information technologies (CMI).

The department focuses on maintaining a close interplay with the university's surroundings - locally, nationally and internationally – as well as producing unique basic research and educating talented and creative engineers. The department collaborates with leading ICT researchers all over the world.

Job description
The main task of the successful candidate will be to contribute to the advancement and completion of the work package on "Measures of Aided Hearing Performance in real-life situations". The aim is to characterize how hearing-aid users perform with their hearing aids, and what could improve their hearing-aid benefit and experience. A test battery evaluating the user's experience will be designed. This test battery shall include tests that reflect everyday experiences, and may include field tests for selected subgroups of users. The test battery shall also include outcome measures that link to user expectations, possible listener preferences, and user needs in general. The data shall be quantified and analyzed jointly with other data for the same individuals, which reflect e.g. speech-in-noise performance, spatial hearing, listening effort and sound quality. The latter will be obtained in collaboration with other project participants.

It will be required to develop setups for computer-controlled tests, and/or to program questionnaires, and/or to conduct contextual inquiries with users, their relatives, relevant health personal, etc.

HA users are recruited according to a joint protocol from the participating University Hospitals.

The overall ambition of the BEAR project is to evaluate the potential of new outcome measures for clinical application. In the choice of methods, priorities shall reflect this consideration.

You may obtain further information from Professor Dorte Hammershøi, Department of Electronic Systems (phone: + 0045 9940 8705, email: dh@es.aau.dk) concerning the scientific aspects of the position.

Qualification requirements:
Appointment as Postdoc presupposes scientific qualifications at PhD–level or similar scientific qualifications. The research potential of each applicant will be emphasized in the overall assessment. Appointment as a Postdoc cannot exceed a period of four years in total at Aalborg University.

The application must contain the following:
• A motivated text wherein the reasons for applying, qualifications in relation to the position, and intentions and visions for the position are stated.
• A current curriculum vitae.
• Copies of relevant diplomas (Master of Science and PhD). On request you could be asked for an official English translation.
• Scientific qualifications. A complete list of publications must be attached with an indication of the works the applicant wishes to be considered. You may attach up to 5 publications.
• Dissemination qualifications, including participation on committees or boards, participation in organisations and the like.
• Additional qualifications in relation to the position.
• References/recommendations.
• Personal data.

The applications are only to be submitted online by using the "Apply online" button below.

An assessment committee will assess all candidates.

For further information concerning the application procedure please contact Anne Christoffersen by mail ach@adm.aau.dk or phone (+45) 9940 9680

Information regarding guidelines, ministerial circular in force and procedures can be seen here.

Workplace
Aalborg

Agreement
Employment is in accordance with the Ministerial Order on the Appointment of Academic Staff at Universities (the Appointment Order) and the Ministry of Finance's current Job Structure for Academic Staff at Universities. Employment and salary are in accordance with the collective agreement for state-employed academics.

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Aalborg University (AAU) conducts teaching and research to the highest level in the fields of humanities, engineering, and natural, health, and social sciences.

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**Fortegnelse over bedømmelsesudvalg til
stilling P21714 Postdoc i alarm og pejlesystemer til personer med demens ved Department of
Architecture, Design and Media Technology**

Navn: Associate Professor Matthias Rehm
Arbejdssted: Department of Architecture Design and Media Technology
E-mail: matthias@create.aau.dk

Navn: Associate Professor Hendrik Knocke
Arbejdssted: Department of Architecture Design and Media Technology
E-mail: hk@create.aau.dk

Akademisk Råd har taget stilling til, at medlemmer af bedømmelsesudvalget er sagkyndige inden for stillingsområdet på et niveau, der mindst svarer til det, der forudsættes for stillingen, dog ikke under lektorniveau.

P21714 Postdoc i alarm og pejlesystemer til personer med demens

Stillingsnummer
P21714

Ved Det Tekniske Fakultet for IT og Design, Institut for Arkitektur, Design og Medieteknologi er en stilling som "Postdoc i alarm og pejlesystemer til personer med demens" ledig fra 1. juli 2017 eller snarest derefter og til 31. januar 2019.

Institut for Arkitektur, Design og Medieteknologi har som mål at udvikle innovative, ingeniørbaserede uddannelses- og forskningsmiljøer, som integrerer kreativitet, ingeniørfaglighed og teknologi med arkitektur, urban design, industriel design, digital design og medieteknologi. Instituttet er blandt de førende forsknings- og uddannelsesmiljøer i Danmark, som beskæftiger sig med den udfordring, der ligger i samspillet mellem kreativitet og teknologi og udvikler nye områder inden for forskning og uddannelse rettet mod slutbrugeren.

Stillingsbeskrivelse
Stillingen som postdoc er en fuldtidsstilling, som tilknyttes HCI gruppen hos Media Technology i Aalborg.

Stillingen omfatter forskning i alarm og pejlesystemer til personer med demens. Fokus i forskningsprojektet er på at få tilpasset de nuværende løsninger til de tre brugergrupper (personer med demens, plejepersonale og pårørende).

Der vil desuden være en række undervisningsopgaver indenfor Interaction Design samt vejledningsopgaver på uddannelserne Medialogi og Produkt- og Designpsykologi.

Ansøgere der har dokumenteret erfaring fra lignende forskningsprojekter og undervisningsopgaver samt kendskab til metoder inden for Interaktionsdesign, Brugervenlighed og User Experience Design vil blive foretrukket.

Spørgsmål til stillingen kan rettes til Professor Thomas Moeslund på mail:
tbm@create.aau.dk

Kvalifikationskrav:
Ansættelse som postdoc forudsætter videnskabelige kvalifikationer som ph.d. eller tilsvarende videnskabelige kvalifikationer. Ved den samlede vurdering af den enkelte ansøger lægges vægt på ansøgerens forskningspotentiale.

Den samlede ansættelse som postdoc kan ikke være på mere end 4 år ved Aalborg Universitet.

Ansøgningen skal indeholde dokumentation for:
- En motiveret tekst, hvori begrundelser for at ansøge, kvalifikationer i forhold til stillingen samt intentioner og visioner for stillingen angives.
- Opdateret curriculum vitae.
- Kopier af relevante eksamensbeviser (kandidat og ph.d.)
- Videnskabelige kvalifikationer. Der skal vedhæftes en komplet publikationsliste med angivelse af de arbejder, ansøgerne ønsker at påberåbe sig. Ansøgerne må max. vedhæfter 5 af disse publikationer.
- Undervisningsmæssige kvalifikationer beskrevet i undervisningsportfolio. Såfremt dette ikke er medsendt skal ansøger vedlægge begrundelse herfor.
- Formidlingsmæssige kvalifikationer, herunder deltagelse i udvalg, bestyrelser, foreninger o.l.
- Øvrige kvalifikationer i forhold til stillingen.
- Referencer/anbefalinger.
- Personlige data.

Den samlede ansøgning inkl. bilag kan kun sendes elektronisk ved at vælge nedenstående "søg online" funktion.

Bedømmelse af ansøgere sker ved sagkyndigt udvalg. Såfremt der er spørgsmål til ansøgningensproceduren, kan der rettes henvendelse til Anne Christoffersen,

ach@adm.aau.dk, tlf. (045) 9940 9680.

Information vedrørende vejledninger, ansættelsesprocedure samt gældende lovgivning på området kan ses her.

Løn og ansættelsesvilkår
Ansættelse sker i henhold til Ansættelsesbekendtgørelse nr. 242 af 13. marts 2012 samt Finansministeriets gældende Stillingsstruktur for videnskabeligt personale ved universiteter. Ansættelse og aflønning iht. overenskomst for akademikere i Staten.

Arbejdssted
Aalborg

Ansøgningsfrist
22/05/2017

Søg online

Aalborg Universitet (AAU) driver undervisning og forskning til højeste niveau inden for humaniora, samfunds-, ingeniør-, natur- og sundhedsvidenskab.

top

AALBORG UNIVERSITET

Fakultetskontoret for ENGINEERING, SUND og TECH

Sagsfremstilling

Overskrift og varighed:	Serviceeftersyn af universitetets vedtægt
Sagsbehandler:	Bettina Thomsen, bt@adm.aau.dk, tlf. 9728, eller Signe Hernvig, she@adm.aau.dk, tlf. 3206
Sagsfremstilling:	Som følge af en kommende universitetslovsændring og et generelt ønske fra rektoratet om et serviceeftersyn af universitetets vedtægt, vil Rektorsekretariatet i løbet af det næste halve år foretage en revision af vedtægten. Med henblik på at kunne formulere et første udkast til en ny vedtægt, søger vi input fra de organer, der er nævnt i universitetets gældende vedtægt. I denne indledende del af processen har vi brug for input fra universitetets organer: akademiske råd, institutråd, studieråd, studienævn og ph.d.-udvalg.

Ifølge bemærkningerne til universitetsloven skal det tydeligt fremgå af vedtægten, hvilke opgaver de enkelte råd, udvalg og nævn skal varetage, samt hvilken kompetence det enkelte råd, udvalg og nævn har ved varetagelsen af disse opgaver.

Nedenfor er indsat de gældende vedtægtsbestemmelser vedr. akademisk råds kompetencer/opgaver.

I relation til de eksisterende vedtægtsbestemmelser anmodes akademisk råd om at overveje følgende:

Er der kompetencer/opgaver vedr. akademisk råd i den gældende vedtægt, som ikke bør fremgår af vedtægten, og hvorfor?
Er der kompetencer/opgaver vedr. akademisk råd, som ikke fremgår af den gældende vedtægt, men som bør fremgå, og hvorfor?

NB: De kompetencer/opgaver, der fremgår af universitetsloven, og som således ikke kan fraviges, er markeret med gul.

§ 21. Fakulteternes akademiske råd har ansvar for at udvikle og vedligeholde en høj akademisk standard og har herunder til opgave:
    1) at godkende strategiplan for fakultetet efter indstilling fra dekanen og inden for rammerne af den strategi, der fastlægges på institutionsniveau,

	2) at udtale sig om centrale strategiske forsknings- og uddannelsesom-råder og planer for vidensudveksling
	3) at drøfte og indstille budget for fakultetet til dekanen, herunder i for-hold til stillingsallokeringer
	4) at nedsætte sagkyndige udvalg til bedømmelse af ansøgere til viden-skabelige stillinger (NB: ifølge universitetsloven indstiller akademisk råd til rektor om sammensætningen af sagkyndige udvalg – på AAU har rek-tor delegeret kompetencen til at nedsætte sagkyndige udvalg til akade-misk råd)
	5) at tildele ph.d.- og doktorgrader,
	6) at fastlægge retningslinjer til fremme af en god videnskabelig praksis og for behandling af sager om videnskabelig uredelighed,
	7) at afgive udtalelser vedrørende den fysiske udbygning,
	8) at arbejde for diversitet og ligebehandling i forskning og undervis-ning samt
	9) at rådgive dekanen i spørgsmål om kvalitetssikring af ph.d.-uddannelser og øvrige uddannelser ved fakultetet.
	Stk. 2. Akademisk råd kan udtale sig om alle akademiske forhold af betydning for fakultetets virksomhed og har pligt til at drøfte akademiske forhold, som rektor, direktøren eller dekanen forelægger. Akademisk råd kan drøfte, hvorvidt forskningsfriheden generelt eller konkret respekteres under fakultetet, og kan afgive udtalelse herom.
Indstilling:	*I relation til de eksisterende vedtægtsbestemmelser anmodes akademisk råd om at overveje og kommentere følgende:* *Er der kompetencer/opgaver vedr. akademisk råd i den gældende vedtægt, som ikke bør fremgår af vedtægten, og hvorfor?* *Er der kompetencer/opgaver vedr. akademisk råd, som ikke fremgår af den gældende vedtægt, men som bør fremgå, og hvorfor?*
Bilag:	

AALBORG UNIVERSITET

**Fakultetskontoret for
ENGINEERING, SUND og TECH**

Dokument dato: 03-05-2017

Dokumentansvarlig: bbc

Senest revideret:

Senest revideret af:

Sagsnr.:

Sagsfremstilling

Overskrift og varighed:	Orientering om og drøftelse af det strategiske arbejde med ligestilling og diversitet på AAU (30 min)
Sagsbehandler:	HR, AAU
Sagsfremstilling:	Trods tidligere strategiske indsatser indenfor ligestilling og diversitet er udviklingen ikke altid foregået i det tempo og omfang, som har været ønske. Direktionen har derfor besluttet at sætte mere fokus på dette område og hæve ambitionsniveauet for resultaterne. Der er etableret Udvalg for Ligestilling og Diversitet. Dekan Lars Hvilsted Rasmussen, SUND er formand, og TECHs repræsentant er Bent Thomsen. Der skal udarbejdes en strategisk handleplan for perioden 2017 – 2021. Der er indgået aftale med Videnscenter for Ligestilling, Diversitet og Køn (EDGE), som bl.a. skal supportere udvalget med analyser og i det hele taget understøtte og kvalitetssikre det strategiske arbejde. Lars Hvilsted Rasmussen vil kort orientere om udvalgets arbejde. Lektor Stine Thidemann Faber, EDGE / Institut for Kultur og Globale Studier vil præsentere de analyser m.v., som EDGE har planlagt.
Indstilling:	- At akademisk råd tager orienteringen til efterretning - At akademisk råd bidrager med synspunkter på, hvad der er forudsætningen for at ligestillings- og diversitetsarbejdet skaber resultater.
Bilag:	Kommissorium for Udvalget for Ligestilling og Diversitet på AAU

Kommissorium for Udvalget for Ligestilling og Diversitet

Udvalget for Ligestilling og Diversitet er nedsat af direktionen på Aalborg Universitet. Udvalget har ansvaret for den strategiske og langsigtede udvikling af og arbejde med ligestillingsområdet på Aalborg Universitet.

Temamæssigt beskæftiger udvalget sig med køn, alder, etnicitet, nationalitet, seksuel orientering, religiøs observans, medarbejdere med fysisk og/eller psykisk funktionsnedsættelse mv.

Udvalgets sammensætning

- Direktionsmedlem (formand)[1]
- En prodekan[2]
- En institutleder[3]
- HR-chefen
- Repræsentant fra HUM[4]
- Repræsentant fra SAMF[5]
- Repræsentant fra TEK/NAT[6]
- Repræsentant fra SUND[7]
- TAP-repræsentant[8]

Formål

Udvalget for ligestilling og diversitet har til at formål at følge og skabe rammen for ligestillingsarbejdet på Aalborg Universitet med henblik på at skabe lige muligheder for alle.

Udvalgets opgaver

- Med udgangspunkt i strategiens (*Viden for Verden*) ambitioner, udarbejdes 5-årsplaner for ligestilling og diversitet på Aalborg Universitet (første periode 2016-2021)

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[1] Direktionsmedlemmet udpeges af rektor.
[2] Prodekanen udpeges af prodekankredsen blandt de, der ikke er repræsenteret ved direktionsmedlem.
[3] Rektor beder fakulteterne om at indmelde ét forslag til en institutlederrepræsentant. Rektor udpeger institutlederrepræsentanten blandt forslagene.
[4] HUM-repræsentanten vælges blandt og udpeges af medlemmerne af Akademisk Råd.
[5] SAMF-repræsentanten vælges blandt og udpeges af medlemmerne af Akademisk Råd.
[6] TEK/NAT-repræsentanten vælges blandt og udpeges af medlemmerne af Akademisk Råd.
[7] SUND-repræsentanten vælges blandt og udpeges af medlemmerne af Akademisk Råd.
[8] TAP-repræsentanten vælges blandt og udpeges af medlemmerne af B-siden i HSU.

- *Ad hoc* analyser og handlinger indenfor relevante områder af ligestilling og diversitetsområdet
- Formidling, internt såvel som eksternt, af universitetets ligestilling og diversitetsindsats
- Årlig afrapportering til universitetets bestyrelse, direktion, hovedsamarbejdsudvalg, akademiske råd m.fl.
- Monitorere og overvåge at universitetet overholder Lov om ligestilling, primært ift. kønsbalancen, samt udarbejde udkast til universitetets årlige indberetninger jf. krav i loven
- Monitorere og overvåge at universitetet overholder egne vedtægter (§ 24, 8), samt Samarbejdsaftalen
- Monitorerer og overvåge udviklingen bredt indenfor udvalgets arbejdsområde
- Udvikling og vedligeholdelse af universitetets ligestillingsrapport (forefindes i Qlikview)
- Udarbejdelse af div. afrapporteringer til ministerier, styrelser mv.

Forholdet til direktionen og universitetets øvrige organer

Udvalget fungerer som et rådgivende organ for direktionen og bestyrelsen.

Formanden orienterer direktionen, bestyrelsen og hovedsamarbejdsudvalget om udvalgets virke.

Formanden indstiller udvalgets sager til beslutning eller godkendelse i direktionen.

Formanden har i øvrigt pligt til tværgående opmærksomhed, dvs. at forholde sig til, om emner drøftet i organet har berøringsflader til andre organer.

Møder og referater

Formanden indkalder til og leder møderne i udvalget.

Der afholdes ordinære møder 4 gange om året. Ét hvert kvartal med udgangspunkt i det af udvalget vedtagne årshjul.

Møderne afholdes i arbejdstiden og gerne på skiftende matrikler/campusser. Ligestillingsudvalgets tilstedeværelse på det pågældende campus afvikles med fokus på synlighed, og at også lokale interessenter (ledere, medarbejdere, tillidsrepræsentanter, arbejdsmiljørepræsentanter m.fl.) kan interagere med udvalgsmedlemmerne ift. videndeling og inspiration.

Ekstraordinære møder afholdes, når formanden finder det nødvendigt.

På årets sidste møde aftaler udvalget mødeplan, samt reviderer og vedtager årshjulet for det kommende år.

Medlemmerne skal have den fornødne tid til rådighed til udvalgsarbejdet.

Sekretariatet indkalder til møder og udsender dagsorden 10 dage før mødets afholdelse.

Formanden kan ved særlige grunde beslutte, at indkaldelse sker med kortere varsel.

Ligestillingsudvalgets referater er relativt korte beslutningsreferater med angivelse af hovedtemaerne i drøftelserne, samt konklusionerne heraf. Hvis medlemmerne ønsker at få konkrete individuelle eller partsmæssige synspunkter ført til referat, skal man gøre opmærksom på dette under mødet.

Sekretæren udarbejder et referat fra hvert møde og sender det til medlemmerne senest 5 arbejdsdage efter mødets afholdelse. Medlemmerne har 5 arbejdsdage, efter modtagelse af referat fra sekretæren, til at kommentere herpå, hvorefter referatet er godkendt og offentliggøres på AAU's hjemmeside (inside.aau.dk), samt arkiveres i CAPTIA.

Om nødvendigt inddrages formandsskabet i eventuelle ændringer i referatet, inden endelig godkendelse.

Sagernes fremlæggelse

Sager der ønskes behandlet i udvalget skal fremsendes skriftligt (sagsfremstilling og bilag) én uge inden udsendelse af dagsorden. Sager fremsendes til sekretariatet.

Sager, som optages på dagsordenen, kan enten fremstilles som en: orientering, drøftelse eller beslutning/godkendelse og behandles i henhold hertil.

Tavshedspligt

Drøftelserne i udvalget er som udgangspunkt åbne. Dog har medlemmerne den tavshedspligt, der følger af forvaltningslovens § 27, f.eks. når en oplysning ved lov eller anden gyldig bestemmelse er betegnet som fortrolig, eller når det i øvrigt er nødvendigt at hemmeligholde den for at varetage væsentlige hensyn til institutionens eller private interesser. Sager der behandles fortroligt får en begrundelse herfor.

Budget

Udvalget har et selvstændigt budget, der skal dækkes de økonomiske udgifter ved arrangementer og mødeafholdelser, herunder rejseaktiviteter. Samtidig skal budgettet tilråde, at der foretages kvalitative og kvantitative analyser for at monitorere ligestillingsarbejdet på AAU. Sekretariatet søger årligt om et fast beløb til udvalget, og budgettet forankres i HR-afdelingen.

Sekretariatsbetjening

Udvalget sekretariatsbetjenes af HR-afdelingen.

Ikrafttrædelse, ændringer og opsigelse

Dette kommissorium er drøftet af Udvalget for Ligestilling og Diversitet den 13.10.2016 og efterfølgende indstillet til godkendelse i direktionen.

Udvalget for Ligestilling og Diversitet kan indstille ændringer af kommissoriet til direktionen, hvis udvalget måtte finde det nødvendigt.

Godkendt af direktionen d. 4. november 2016

Det Tekniske Fakultet for IT og Design - Fortegnelse over sager godkendt af Dekanen i perioden 21.03.2017-08.05.2017

Kodeforklaring

A1: Ansættelse med opslag

A2: Ansættelse u/ opslag (tidsbegrænset)

1F: 1. forlængelse

2F: 2. forlængelse

3F: Forlængelse pga barsel/orlov/fastansætte

G: Genansættelse

O: oprykning

(i) intern ansættelse (u) ekstern ansættelse

	Periode Fra	Til	Institut	Kode
Ansættelse/genansættelse af videnskabelige assistenter				
Ilkcan Keles	01.05.2017	31.10.2017	CS	A2
Lars Grundahl	01.09.2017	28.02.2018	Plan	A2
Kasper Halkjær Jensen	01.04.2017	31.01.2018	Create	A2
Ramin Irani	01.06.2017	31.01.2018	ES	A2
Nicolai Bæk Thomsen	01.06.2017	31.07.2017	ES	1F
Chenjuan Guo	10.05.2017	30.04.2018	CS	A2
Ansættelse/genansættelse af adjunkter (tidsbegrænset)				
Rikke Gade	01.01.2018	31.12.2018	Create	1F
Sara Bjørn Aaen	01.05.17	30.04.20	Plan	A1
Ansættelse/genansættelse af adjunkter (ikke tidsbegrænset)				
Ansættelse af studieadjunkter				
Ansættelse/genansættelse af PostDoc				
Linda Nhu Laursen	17.03.2017	30.04.2019	Create	A1
Burak Cakmak	15.04.2017	14.04.2018	ES	A2
Boris Andersen	01.04.2017	31.03.2018	Plan	A2
Thi Thao Nguyen Ho	01.06.2017	31.05.2018	Datalogi	A2
Jacob Bjerre Mikkelsen	01.04.2017	31.03.2018	Create	A2
Signe Christensen	01.08.2017	31.07.2020	Create	A1
Idongesit Williams	01.05.2017	31.08.2017	ES	A2
Søren Tranberg Hansen	01.05.2017	30.11.2017	ES	A2
Ansættelse af lektorer (tidsbegrænset)				
Jimmy Jessen Nielsen	01.04.2017	31.03.2021	ES	A1
Ansættelse af lektorer (tidsubegrænset)				
Cedomir Stefanovic	01.06.2017		ES	A1
Per Lynggaard	01.05.2017		ES	A1
Ansættelse af studielektorer				

Ansættelse/genansættelse af professorer

Ansættelse/genansættelse af professorer MSO

Ansættelse/genansættelse af adjungerende

Professor Emeritus

Lektor Emeritus

Orlov

Jannick H. Schmidt (80%)	21.03.2017	21.03.2018	Plan
Anne Kirkegaard Bejder	27.11.2017	07.01.2018	Create
Vinay Setty	01.08.2017	31.07.2018	CS

Opsigelser

Nuno Pratas	17.04.2017		ES
Muhammad Bilal	31.03.2017		ES
David Connolly	30.04.2017		PLAN
Julie Gade	30.04.2017		Create

Opslag af stillinger

Associate Professor in Problem Based Learning and Engineering Education (42219)	15.08.2017	14.08.2020	Plan
Studielektor i Integrated Food Studies (SL2912)	01.05.2017	30.04.2020	Plan
Videnskabelig assistent i computergrafik	01.07.2017	30.06.2018	Create
Postdoc in Outcome Measures… (P21705)	01.07.2017	30.06.2018	ES
Associate Professor in Wireless Communication…	15.07.2017	14.07.2020	ES
Adjunkt i Computer Vision and Computer ….	01.08.2017	31.07.2020	Create
P21714 Postdoc i alarm og pejlesystemer til personer	01.07.2017	31.01.2019	Create

Overflyttelser, ændring i timetal

Flemming Christensen	01.03.2017	31.12.2017	ES	29,6 t.

Godkendte sager af dekanen TECH fra den 21.03.2017-05.05.2017

Stipendieopslag:
Wireless Communications, Institut for Elektroniske Systemer (8-17027**)**

Tildeling af stipendium:
Susana Paardekooper, Institut for Planlægning, pr. 1. august 2017 (20-17016)
Yilin Ji, Institut for Elektroniske Systemer pr. 15. maj 2017 (8-17015)