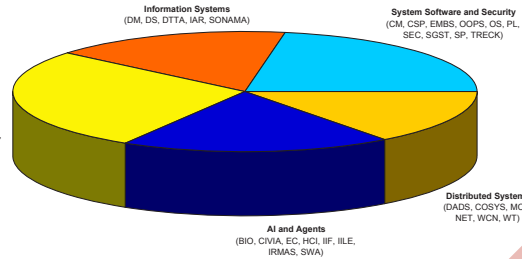


2015 Symposium on Applied Computing



Association for
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Advancing Computing as a Science & Profession

Main Menu



Committee



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Chair Messages



Table of Contents



Keyword Index



Author Index



Reviewer Index

Hosted by
University of Salamanca

The 30th Annual ACM Symposium on Applied Computing

Salamanca, Spain
April 13-17, 2015

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The ACM Special Interest Group on Applied Computing is ACM's primary applications-oriented SIG. Its mission is to further the interests of the computing professionals engaged in the development of new computing applications and applications areas and the transfer of computing technology to new problem domains. SIGAPP offers practitioners and researchers the opportunity to share mutual interests in innovative application fields, technology transfer, experimental computing, strategic research, and the management of computing. SIGAPP also promotes widespread cooperation among business, government, and academic computing activities. Its annual Symposium on Applied Computing (SAC) provides an international forum for presentation of the results of strategic research and experimentation for this inter-disciplinary environment. SIGAPP membership fees are: \$15.00 for ACM Non-members, \$15.00 for ACM Professional Members, and \$8.00 for ACM Student Members. For further information on SIGAPP, please contact Sung Shin at Sung_Shin@sdstate.edu or visit the SIGAPP website at <http://www.acm.org/sigapp>.

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Message from the Symposium Chairs

On behalf of the Organizing Committee, we welcome you to the 30th Annual ACM Symposium on Applied Computing (SAC 2015), hosted by the University of Salamanca. This international forum has been dedicated to computer scientists, engineers and practitioners for the purpose of presenting their research findings and results in various areas of applied computing. The organizing committee is grateful for your participation in this exciting international event. We hope that this conference proves interesting and beneficial for all of you.

The Symposium on Applied Computing is sponsored by the ACM Special Interest Group on Applied Computing (SIGAPP), whose mission is to further the interests of computing professionals engaged in the design and development of new computing applications, interdisciplinary applications areas, and applied research. This conference is dedicated to the study of applied computing research of real-world problems. In addition, this event provides an avenue to discuss and exchange new ideas in the wide spectrum of applied computing areas. We all recognize the importance of updating the latest developments and research in our current areas of expertise.

SAC 2015 offers Technical Tracks and Poster Sessions. The success of the conference can be attributed to the substantial contribution of dedicated Track Chairs and Co-Chairs. Each track maintains a program committee and a set of highly qualified reviewers. We wish to thank the Track Chairs, Co-Chairs, Committee Members and participating reviewers for their hard work and effort to make the SAC 2015 conference a high quality conference. We also thank our invited keynote speakers, Dr. Il-Yeol Song, College of Computing & Informatics, Drexel University, Philadelphia, Pennsylvania USA, and Dr. Matthias Klusch, German Research Center for Artificial Intelligence (DFKI), Agents and Simulated Reality Department, Saarbruecken, Germany for sharing their knowledge and expertise with SAC 2015 attendees. Most of all, we would like to especially thank the authors and presenters for sharing their experience with the rest of us and to all attendees for joining us in Salamanca, Spain this year.

The local organizing committee has been a major contributor to the success of the SAC 2015 conference. Our gratitude goes to the Local Arrangement Co-Chair Dr. Javier Bajo, Technical University of Madrid, Madrid, Spain and the Local Arrangement Co-Chair Dr. Fernando De la Prieta, University of Salamanca, Salamanca, Spain.

We also extend our thanks to the Publication Chair, Dr. Dongwan Shin, New Mexico Tech, Socorro, New Mexico, for his tremendous effort in putting together yet another conference proceedings, Posters Chair, Dr. Chih-Cheng Hung, Southern Polytechnic State University, Marietta, Georgia, USA, for his hard work to make a successful Poster Program, and Tutorials Chair Dr. Sara Rodriguez, University of Salamanca, Salamanca, Spain, for arranging an exciting set of Tutorials. A special thanks to our Program Co-Chairs: Dr. Jiman Hong, Soongsil University, Seoul, Korea, and Dr. Alessio Bechini, University of Pisa, Pisa, Italy for coordinating and bringing together an excellent Technical Program.

Again, we welcome you to SAC 2015 in the beautiful city of Salamanca, Spain. We hope you enjoy the SAC 2015 conference and your stay in Spain. Next year, we invite you to participate in SAC 2016 to be held in Pisa, Italy. The conference will be hosted by University of Pisa.

Roger L. Wainwright, SAC 2015 Conference Chair
Juan Manuel Corchado, SAC 2015 Conference Vice-Chair

Message from the Program Chairs

Welcome to the 30th International Symposium on Applied Computing (SAC 2015). For the past 29 years, SAC has become a major international venue for computing researchers and applied practitioners to convene and share ideas on recent developments in a variety of applied areas of information technology. The success of SAC has been the consolidation of a wide range of applied areas into specialized modules called Tracks. Each of the Tracks is then organized and administered by experts in the respective areas by instituting program committees, carrying out blind reviews according to the ACM guidelines, and finally selecting the highly qualified papers for the Track. Since its inception eight years ago, the Poster Sessions at SAC have become a tradition, and this year again the Poster will be an integral part of the Technical Program at SAC 2015.

The 37 Tracks present in the final program for SAC 2015 originated from the open Call for Track Proposals and are the result of an initial selection of the proposals and a subsequent merging due to organization reasons. The selection was made based both on the success of analogous Tracks in the previous SACs, and targeting new and emerging areas. The Call for Papers for these Tracks attracted 1211 submissions from 57 different countries. The submitted papers underwent the blind review process and, after the subsequent selection, 291 full papers were finally included in Conference Program to be presented during the Symposium, and published in the Conference Proceedings. The final overall acceptance rate for SAC 2014 is 24%. In addition to the accepted full papers, 77 submissions that received high enough review scores were accepted as short papers for the Poster program. The Student Research Competition (SRC) program, sponsored by Microsoft Research, was added starting from SAC 2013. The SRC program is designed to provide graduate students with the opportunity to meet and exchange ideas with researchers and practitioners in their areas of interest. The 15 SRC contributions actually present in the final program have been selected out of 42 submissions.

The Technical Program of SAC 2015 is made possible through the hard work of many people from the scientific community who have volunteered and committed many hours to make it a success. Much credit goes to the Track Chairs, who committed to guarantee a very high-level scientific profile, dedicating their personal efforts in managing the reviewing process for their Tracks. Once again this year, we follow the previous years' tradition in organizing various tracks into five different themes. The Symposium Proceedings and the technical presentations are focused around these themes to form a series of related track sessions.

On behalf of the entire SAC 2015 Organizing Committee, we congratulate all the authors for having their papers accepted in their respective Tracks, and we wish to thank all of those who made this year's technical program a great success. Specifically we wish to thank the speakers, posters chair, track chairs, reviewers, program committee members, session chairs, presenters, and all the attendees. We also wish to convey our special thanks to the local organizing committee lead by Dr. Juan Manuel Corchado from University of Salamanca, Salamanca, Spain, Dr. Javier Bajo, Technical University of Madrid, Madrid, Spain, and Dr. Fernando De la Prieta from University of Salamanca, Salamanca, Spain.

We wish you all a pleasant stay in Salamanca, hope you have a great time at SAC 2015, and you will have the opportunity to share and exchange your ideas and foster new collaborations. We would also like to take this opportunity to convey to you the news that the 31st International Symposium on Applied Computing (SAC 2016) will be held in Tuscany, Italy, a region known worldwide for its cultural, artistic, and scientific tradition. The event is scheduled to take place in the historical town of Pisa, whose "leaning tower" is one of the most famous, iconic touristic attractions in Europe. We hope to see you all at SAC 2016.

Jiman Hong, Soongsil University, Seoul, Korea
Alessio Bechini, University of Pisa, Pisa, Italy

Table of Contents

Scroll to the title and select a [Blue](#) link to open a paper. After viewing the paper, use the bookmarks to the left to return to the beginning of the Table of Contents.

Symposium Organizing Committee	iii
Sponsoring SIG Information	iv
Track Chairs (Co-Editors)	v
Message from the Symposium Chairs	xi
Message from the Program Chairs	xii

Volume I: Artificial Intelligence and Agents, Distributed Systems, and Information Systems

Computational Biology and Bioinformatics Track

Track Co-Chairs: Juan Manuel Corchado, University of Salamanca, Spain
Paola Lecca, University of Trento, Italy
Dan Tulpan, National Research Council, Canada

Track Editorial	1
Transcript-Based Reannotation for Microarray Probesets	3
<i>Eduardo Valente, Polytechnic Institute of Castelo Branco, Portugal</i> <i>Miguel Rocha, University of Minho, Portugal</i>	
Discovering Weighted Motifs in Gene Co-Expression Networks	10
<i>Sarvenaz Choobdar, University of Porto, Portugal</i> <i>Pedro Ribeiro, University of Porto, Portugal</i> <i>Fernando Silva, University of Porto, Portugal</i>	
Facing the Genome Data Deluge: Efficiently Identifying Genetic Variants with In-Memory Database Technology	18
<i>Cindy Fährnich, University of Potsdam, Germany</i> <i>Matthieu-P. Schapranow, University of Potsdam, Germany</i> <i>Hasso Plattner, University of Potsdam, Germany</i>	
All-in-Focus Imaging Technique used to Improve 3D Retinal Fundus Image Reconstruction	26
<i>Danilo Motta, Universidade de São Paulo, Brazil</i> <i>Luciana de Matos, Universidade de São Paulo, Brazil</i> <i>Amanda Caniatto de Souza, Wavetek, Brazil</i> <i>Rafael Marcato, Wavetek, Brazil</i> <i>Afonso Paiva, Universidade de São Paulo, Brazil</i> <i>Luis Alberto Vieira de Carvalho, Universidade de São Paulo, Brazil</i>	

PBS Finder: A Tool to Assist RNA Binding Proteins Studies	32
<i>Diogo Teixeira, Universidade do Porto, Portugal</i>	
<i>Andrea Cruz, Universidade do Porto, Portugal</i>	
<i>Sandra Bráz, Universidade do Porto, Portugal</i>	
<i>Alexandra Moreira, Universidade do Porto, Portugal</i>	
<i>João Relvas, Universidade do Porto, Portugal</i>	
<i>Rui Camacho, Universidade do Porto, Portugal</i>	
MyHealth: A Cross-Domain Platform for Healthcare	40
<i>Maribel Yasmina Santos, University of Minho, Portugal</i>	
<i>Cristiano Pendão, University of Minho, Portugal</i>	
<i>Bruno Ferreira, University of Minho, Portugal</i>	
<i>Luís Gonçalves, University of Minho, Portugal</i>	
<i>Guilherme Moreira, University of Minho, Portugal</i>	
<i>Adriano Moreira, University of Minho, Portugal</i>	
<i>João Á. Carvalho, University of Minho, Portugal</i>	
Inference of Disease-Specific Gene Interaction Network using a Bayesian Network Learned by Genetic Algorithm	47
<i>Daye Jeong, Yonsei University, Korea</i>	
<i>Yunku Yeu, Yonsei University, Korea</i>	
<i>Jaegyoon Ahn, UCLA, USA</i>	
<i>Youngmi Yoon, Gachon University, Korea</i>	
<i>Sanghyun Park, Yonsei University, Korea</i>	
Poster Paper	
P-SaMI: A Data-Flow Pattern to Perform Massively-Parallel Molecular Docking Experiments using a Fully-Flexible Receptor Model	54
<i>Patricia Hübler, Instituto Federal Rio Grande do Sul, Brazil</i>	
<i>Duncan Ruiz, Pontificia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>João Eduardo Ferreira, Universidade de São Paulo, Brazil</i>	
<i>Osmar Norberto de Souza, Pontificia Universidade Católica do Rio Grande do Sul, Brazil</i>	
Computational Intelligence and Video and Image Analysis Track	
Track Co-Chairs:	Agostinho Rosa, LaSEEB - ISR – IST - Technical University of Lisbon, Portugal
	Yin-Fu Huang, National Yunlin University of Science and Technology, Taiwan
Track Editorial	58
A New Approach to Biometric Recognition based on Hand Geometry	59
<i>Márcia V.P. do Nascimento, Universidade Federal da Paraíba, Brazil</i>	
<i>Leonardo V. Batista, Universidade Federal da Paraíba, Brazil</i>	
<i>N.L. Cavalcanti Jr., Universidade Federal da Paraíba, Brazil</i>	
3DLBP and HAOG fusion for Face Recognition Utilizing Kinect as a 3D Scanner	66
<i>João Baptista Cardia Neto, São Paulo State University, Brazil</i>	
<i>Aparecido Nilceu Marana, São Paulo State University, Brazil</i>	
Shape Description based on Bag of Saliency Points	74
<i>Glauco V. Pedrosa, University of São Paulo, Brazil</i>	
<i>Agma J.M. Traina, University of São Paulo, Brazil</i>	
<i>Celia A.Z. Barcelos, Federal University of Uberlandia, Brazil</i>	

A Shortest Path Algorithm for 2D Seismic Horizon Tracking	80
<i>Eliana L. Goldner, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Cristina N. Vasconcelos, Universidade Federal Fluminense, Brazil</i>	
<i>Pedro Mário Silva, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Marcelo Gattass, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	

OR-PCA with Dynamic Feature Selection for Robust Background Subtraction	86
<i>Sajid Javed, Kyungpook National University, Korea</i>	
<i>Andrews Sobral, Université de La Rochelle, France</i>	
<i>Thierry Bouwmans, Université de La Rochelle, France</i>	
<i>Soon Ki Jung, Kyungpook National University, Korea</i>	

Poster Papers

Compact and Discriminative Approach for Encoding Spatial-Relationship of Visual Words	92
<i>Glauco V. Pedrosa, University of São Paulo, Brazil</i>	
<i>Agma J.M. Traina, University of São Paulo, Brazil</i>	

OpenACC-Based GPU Acceleration of an Optical Flow Algorithm	96
<i>Nelson Martin, Complutense University of Madrid, Spain</i>	
<i>Jorge Collado, Complutense University of Madrid, Spain</i>	
<i>Guillermo Botella, Complutense University of Madrid, Spain</i>	
<i>Carlos Garcia, Complutense University of Madrid, Spain</i>	
<i>Manuel Prieto, Complutense University of Madrid, Spain</i>	

Student Research Competition Paper

An Architecture of Recommender System for Scientific Paper	99
<i>Arthur Max Cavalcante Rocha, Federal University of Alagoas, Brazil</i>	

Applications of Evolutionary Computing Track

Track Co-Chairs: Raúl Giráldez Rojo, Pablo de Olavide University, Spain
 Beatriz Pontes Balanza, University of Seville, Spain

Track Editorial	101
------------------------------	-----

Evolving Regression Trees Robust to Missing Data	102
<i>Luciano C. Blomberg, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>Rodrigo C. Barros, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>Duncan D. Ruiz, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil</i>	

Evolving Decision-Tree Induction Algorithms with a Multi-Objective Hyper-Heuristic	110
<i>Márcio P. Basgalupp, Federal University of São Paulo, Brazil</i>	
<i>Rodrigo C. Barros, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>Vili Podgorelec, University of Maribor, Slovenia</i>	

An Approach to the MOGAs Initialization Problem using an Algorithm based on Path Relinking	118
<i>Thiago Gomes Nepomuceno, Universidade Estadual do Ceará, Brazil</i>	
<i>José Everardo Bessa Maia, Universidade Estadual do Ceará, Brazil</i>	
<i>Leonardo Sampaio Rocha, Universidade Estadual do Ceará, Brazil</i>	

Dynamic Optimization of Multi-Layered Reinsurance Treaties	125
<i>Haoxu Wang, Dalhousie University, Canada</i>	
<i>Omar A.C. Cortes, Instituto Federal do Maranhão, Brazil</i>	
<i>Andrew Rau-Chaplin, Dalhousie University, Canada</i>	
Collective Preferences in Evolutionary Multi-Objective Optimization: Techniques and Potential Contributions of Collective Intelligence	133
<i>Daniel Cinalli, Universidade Federal Fluminense, Brazil</i>	
<i>Luis Martí, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Nayat Sanchez-Pi, Instituto de Lógica, Filosofia e Teoria da Ciência, Brazil</i>	
<i>Ana Cristina Bicharra Garcia, Universidade Federal Fluminense, Brazil</i>	
Student Research Competition Paper	
Color Image Quantization using Interactive Genetic Algorithm	139
<i>Seunghyun Jo, Seoul National University, Korea</i>	
Smart Human Computer Interaction Track	
Track Co-Chairs:	Anand Paul, Kyungpook National University, Korea
	Soon Ki Jung, Kyungpook National University, Korea
	Wenmin Wang, Peking University, China
Track Editorial	141
Benchmarking Motion Sensing Devices for Rehabilitative Gaming	143
<i>Gary Ushaw, Newcastle University, UK</i>	
<i>Richard Davison, Newcastle University, UK</i>	
<i>Janet Eyre, Newcastle University, UK</i>	
<i>Graham Morgan, Newcastle University, UK</i>	
Design Framework Enhancing Developer Experience in Collaborative Coding Environment	149
<i>Jarmo Palviainen, Tampere University of Technology, Finland</i>	
<i>Terhi Kilamo, Tampere University of Technology, Finland</i>	
<i>Johannes Koskinen, Tampere University of Technology, Finland</i>	
<i>Janne Lautamäki, Tampere University of Technology, Finland</i>	
<i>Tommi Mikkonen, Tampere University of Technology, Finland</i>	
<i>Antti Nieminen, Tampere University of Technology, Finland</i>	
Evaluation of Web Accessibility on the Maps Domain	157
<i>Jonathas Leontino Medina, Instituto Federal de Mato Grosso do Sul, Brazil</i>	
<i>Maria Istela Cagnin, Universidade Federal de Mato Grosso do Sul, Brazil</i>	
<i>Débora Maria Barroso Paiva, Universidade Federal de Mato Grosso do Sul, Brazil</i>	
Selfie Cafe: Socialization in Public Spaces	163
<i>Andre O. Bueno, Federal University of São Carlos, Brazil</i>	
<i>Junia C. Anacleto, Federal University of São Carlos, Brazil</i>	
<i>Vinicius Ferreira, Federal University of São Carlos, Brazil</i>	
<i>Janaina Abib, Federal University of São Carlos, Brazil</i>	
<i>Carolina Souza, Federal University of São Carlos, Brazil</i>	
<i>Daniel Consiglieri, Federal University of São Carlos, Brazil</i>	

An Anonymous ID-Based Remote Mutual Authentication with Key Agreement Protocol on ECC using Smart Cards	169
<i>A. Goutham Reddy, Kyungpook National University, Korea</i>	
<i>Gil-Je Lee, Kyungpook National University, Korea</i>	
<i>Kee-Young Yoo, Kyungpook National University, Korea</i>	
Towards a Catalog of Usability Smells	175
<i>Diogo Almeida, Universidade do Minho, Portugal</i>	
<i>José Creissac Campos, Universidade do Minho, Portugal</i>	
<i>João Saraiva, Universidade do Minho, Portugal</i>	
<i>João Carlos Silva, Instituto Politécnico do Cávado e do Ave, Portugal</i>	
Poster Paper	
Integrating Contexts in Healthcare: Guidelines to Help the Designers at Design Process	182
<i>Janaina C. Abib, Federal Institute of São Paulo, Brazil</i>	
<i>Junia C. Anacleto, Federal University of São Paulo, Brazil</i>	
Student Research Competition Paper	
A Methodology to Enrich Student-Teacher Interaction in eLearning	185
<i>Muhammad Farhan, University of Engineering and Technology, Lahore, Pakistan</i>	
Intelligent Information Fusion Track	
Track Co-Chairs:	Juan Manuel Corchado, University of Salamanch, Spain
	Javier Bajo, Technical University of Madrid, Spain
Track Editorial	187
Using Graph-Based Models in a Persuasive Social Recommendation System	189
<i>Javier Palanca, Universitat Politècnica de València, Spain</i>	
<i>Stella Heras, Universitat Politècnica de València, Spain</i>	
<i>Javier Jorge, Universitat Politècnica de València, Spain</i>	
<i>Vicente Julian, Universitat Politècnica de València, Spain</i>	
Smell Classification of Wines by the Learning Vector Quantization Method	195
<i>Sigeru Omatu, Osaka Institute of Technology, Japan</i>	
<i>Mitsuaki Yano, Osaka Institute of Technology, Japan</i>	
<i>Yoshinori Ikeda, Osaka Institute of Technology, Japan</i>	
Ontology Definition and Cognitive Analysis in Occupational Health and Security (OHS) Environments	201
<i>Nayat Sanchez-Pi, Instituto de Lógica, Filosofia e Teoria da Ciência, Brazil</i>	
<i>Luis Martí, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Jose Manuel Molina, Charles III University of Madrid, Spain</i>	
<i>Ana Cristina Bicharra Garcia, Federal Fluminense University, Brazil</i>	

Intelligent and Interactive Learning Environments Track

Track Co-Chairs: Ig Bittencourt, Federal University of Alagoas, Brazil
Seiji Isotani, University of São Paulo, Brazil
Emmanuel Blanchard, University of Montreal, Canada
Julita Vassileva, University of Saskatchewan, Canada

Track Editorial 207

Amê: An Environment to Learn and Analyze Adversarial Search Algorithms using Stochastic Card Games 208

Ana Beatriz Cruz, Federal Center of Technological Education of Rio de Janeiro, Brazil
Sabrina Serique, Federal Center of Technological Education of Rio de Janeiro, Brazil
Leonardo Preuss, Federal Center of Technological Education of Rio de Janeiro, Brazil
Angélica Ogasawara, Federal Center of Technological Education of Rio de Janeiro, Brazil
João Quadros, Federal Center of Technological Education of Rio de Janeiro, Brazil
Eduardo Bezerra, Federal Center of Technological Education of Rio de Janeiro, Brazil
Uéverton Souza, Federal Center of Technological Education of Rio de Janeiro, Brazil
Eduardo Ogasawara, Federal Center of Technological Education of Rio de Janeiro, Brazil

Does Gamification Work for Boys and Girls? An Exploratory Study with Virtual Learning Environment 214

Lais Z. Pedro, University of São Paulo, Brazil
Aparecida M.Z. Lopes, University of São Paulo, Brazil
Bruno G. Prates, Federal Institute of São Paulo, Brazil
Julita Vassileva, University of Saskatchewan, Canada
Seiji Isotani, University of São Paulo, Brazil

EASy-DSBuilder: Automated Assessment of Tree Data Structures in Computer Science Teaching 220

Claus A. Usener, University of Muenster, Germany

A Survey Analysis on Goal Orientation Changes in an Information Systems Distance Course: A Brazilian Case Study 227

Cheops Araujo Malta, Universidade Federal de Alagoas, Brazil
Ranilson O. Araújo Paiva, Universidade Federal de Campina Grande, Brazil
Alan Pedro da Silva, Universidade Federal de Alagoas, Brazil
Ig Ibert Bittencourt, Universidade Federal de Alagoas, Brazil
Ananias Queiroga de Oliveira Filho, Universidade São Francisco, Brazil

Improving Pedagogical Recommendations by Classifying Students According to their Interactional Behavior in a Gamified Learning Environment 233

Ranilson O. Araújo Paiva, Universidade Federal de Campina Grande, Brazil
Ig Ibert Bittencourt, Universidade Federal de Alagoas, Brazil
Alan Pedro da Silva, Universidade Federal de Alagoas, Brazil
Seiji Isotani, Universidade de São Paulo, Brazil
Patricia Jaques, Universidade do Rio dos Sinos, Brazil

Beyond Fun: An Interactive and Educational 3D Traffic Rules Game Controlled by Non-Traditional Devices 239

Maria Andréia F. Rodrigues, Universidade de Fortaleza, Brazil
Daniel V. Macedo, Universidade de Fortaleza, Brazil
Yvens R. Serpa, Universidade de Fortaleza, Brazil
Ygor R. Serpa, Universidade de Fortaleza, Brazil

Towards Automatic Prediction of Student Performance in STEM Undergraduate Degree Programs	247
<i>Laci Mary Barbosa Manhães, Universidade Federal do Rio de Janeiro, Brazil</i>	
<i>Sérgio Manuel Serra da Cruz, Universidade Federal Rural do Rio de Janeiro, Brazil</i>	
<i>Geraldo Zimbrão, Universidade Federal do Rio de Janeiro, Brazil</i>	

FAT: A Real-Time (F)orum (A)ssessment (T)ool to Assist Tutors with Discussion Forums Assessment	254
<i>Bernardo Pereira Nunes, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Matthew Tyler-Jones, University of Southampton, UK</i>	
<i>Gilda H.B. de Campos, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Sean W.M. Siqueira, Universidade Federal do Estado do Rio de Janeiro, Brazil</i>	
<i>Marco A. Casanova, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	

Poster Papers

Enforcing Reuse and Customization in the Development of Learning Objects: A Product Line Approach	261
<i>A. Ezzat Labib, Universitat Politècnica de València, Spain</i>	
<i>M. Carmen Penadés, Universitat Politècnica de València, Spain</i>	
<i>José H. Canós, Universitat Politècnica de València, Spain</i>	
<i>Abel Gómez, Inria, France</i>	

Dynamic: A Collaborative Filtering Strategy for Assigning Examination's Rooms to Supervisors	264
<i>Montassar Ben Messaoud, Institut Supérieur de Gestion de Tunis, Tunisia</i>	

Evaluation of a Haptic Virtual Reality Simulator for Endodontics Training	267
<i>Tales Bogoni, Universidade do Estado de Mato Grosso, Brazil</i>	
<i>Márcio Pinho, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>Roberta Scarparo, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil</i>	

Integrating Educational Repositories to Improve the Reuse of Learning Objects	270
<i>Heitor Barros, Universidade Federal de Campina Grande, Brazil</i>	
<i>Evandro Costa, Universidade Federal de Alagoas, Brazil</i>	
<i>Jonathas Magalhães, Universidade Federal de Campina Grande, Brazil</i>	
<i>Ranilson Paiva, Universidade Federal de Campina Grande, Brazil</i>	

Student Research Competition Paper

Smart Learning Environments for Social Learning	273
<i>Enrica Pesare, Università degli studi di Bari Aldo Moro, Italy</i>	

Intelligent Robotics and Multi-Agent Systems Track

Track Co-Chairs:	Christopher Kiekintveld, University of Texas at El Paso, USA
	Rui P. Rocha, University of Coimbra, Portugal
	Denis Wolf, University of São Paulo, Brazil

Track Editorial	275
------------------------------	-----

Robust Resource Allocation in Security Games and Ensemble Modeling of Adversary Behavior	277
<i>Arjun Tambe, University of Southern California, USA</i>	
<i>Thanh Nguyen, University of Southern California, USA</i>	

TRiStar: An i* Extension for Teleo-Reactive Systems Requirements Specifications	283
<i>José Miguel Morales, Universidad Politécnica de Cartagena, Spain</i>	
<i>Elena Navarro, University of Castilla-La Mancha, Spain</i>	
<i>Pedro Sánchez, Universidad Politécnica de Cartagena, Spain</i>	
<i>Diego Alonso, Universidad Politécnica de Cartagena, Spain</i>	
Visual Similarity Analysis in Loop Closure through Data Dimensionality Reduction via Diffusion Maps	289
<i>Leandro A.S. Moreira, Military Institute of Engineering, Brazil</i>	
<i>Claudia M. Justel, Military Institute of Engineering, Brazil</i>	
<i>Paulo F.F. Rosa, Military Institute of Engineering, Brazil</i>	
Improving the Kicking Accuracy in a Soccer Robot	295
<i>Ricardo Dias, University of Aveiro, Portugal</i>	
<i>João Silva, University of Aveiro, Portugal</i>	
<i>José Luis Azevedo, University of Aveiro, Portugal</i>	
<i>Bernardo Cunha, University of Aveiro, Portugal</i>	
<i>António J.R. Neves, University of Aveiro, Portugal</i>	
<i>Nuno Lau, University of Aveiro, Portugal</i>	
Distributed Task Servicing using Multiple Robots with Human-in-the-Loop under Limited Communication Range	301
<i>Parikshit Maini, IIT-Delhi, India</i>	
<i>P.B. Sujit, IIT-Delhi, India</i>	
Distributed Target Identification in Robotic Swarms	307
<i>Paolo Stegagno, Max Planck Institute for Biological Cybernetics, Germany</i>	
<i>Caterina Massidda, Max Planck Institute for Biological Cybernetics, Germany</i>	
<i>Heinrich H. Bülthoff, Max Planck Institute for Biological Cybernetics, Germany</i>	
Force Model of a Robotic Particle Chain for 3D Displays	314
<i>Matteo Lasagni, Graz University of Technology, Austria</i>	
<i>Kay Römer, Graz University of Technology, Austria</i>	
On the Similarities between Control based and Behavior based Visual Servoing	320
<i>Benjamin Fonooni, Umeå University, Sweden</i>	
<i>Thomas Hellström, Umeå University, Sweden</i>	
Poster Papers	
ORCAS: Optimized Robots Configuration and Scheduling System	327
<i>Marin Lujak, University Rey Juan Carlos, Spain</i>	
<i>Alberto Fernández, University Rey Juan Carlos, Spain</i>	
NVL: A Coordination Language for Unmanned Vehicle Networks	331
<i>Eduardo R.B. Marques, Universidade de Lisboa, Portugal</i>	
<i>Manuel Ribeiro, Universidade do Porto, Portugal</i>	
<i>José Pinto, Universidade do Porto, Portugal</i>	
<i>João B. Sousa, Universidade do Porto, Portugal</i>	
<i>Francisco Martins, Universidade de Lisboa, Portugal</i>	
Sustaining Mutual Cooperation in Iterated Prisoner's Dilemma Game	335
<i>Kim Minsam, Hong Kong University of Science and Technology, Hong Kong</i>	
<i>Szeto Kwok Yip, Hong Kong University of Science and Technology, Hong Kong</i>	

The Semantic Web and Applications Track

Track Co-Chairs: Soon Ae Chun, City University of New York, USA

Hyoil Han, Marshall University, USA

Track Editorial	338
Semantic Analysis of Focused Multi-Document Summarization (fMDS) of Text	339
<i>Quinsulon Israel, Drexel University, USA</i>	
<i>Hyoil Han, Marshall University, USA</i>	
<i>Il-Yeol Song, Drexel University, USA</i>	
pFOIL-DL: Learning (Fuzzy) EL Concept Descriptions from Crisp OWL Data using a Probabilistic Ensemble Estimation	345
<i>Umberto Straccia, ISTI - CNR, Italy</i>	
<i>Matteo Mucci, ISTI - CNR, Italy</i>	
RDF Chain Query Optimization in a Distributed Environment	353
<i>Alexander Hogenboom, Erasmus University Rotterdam, The Netherlands</i>	
<i>Ewout Niewenhuijse, Erasmus University Rotterdam, The Netherlands</i>	
<i>Milan Jansen, Erasmus University Rotterdam, The Netherlands</i>	
<i>Flavius Frasinca, Erasmus University Rotterdam, The Netherlands</i>	
<i>Damir Vandić, Erasmus University Rotterdam, The Netherlands</i>	
Learning Folksonomies from Task-Oriented Dialogues	360
<i>Gregory Moro Puppi Wanderley, Pontifícia Universidade Católica do Paraná, Brazil</i>	
<i>Emerson Cabrera Paraiso, Pontifícia Universidade Católica do Paraná, Brazil</i>	
Processing Billions of RDF Triples on a Single Machine using Streaming and Sorting	368
<i>Francesco Corcoglioniti, Fondazione Bruno Kessler, Italy</i>	
<i>Marco Rospocher, Fondazione Bruno Kessler, Italy</i>	
<i>Michele Mostarda, Fondazione Bruno Kessler, Italy</i>	
<i>Marco Amadori, Fondazione Bruno Kessler, Italy</i>	
An Ontological Approach for Simulating Legal Action in the Brazilian Penal Code	376
<i>Cleyton Mário de O. Rodrigues, Federal University of Pernambuco, Brazil</i>	
<i>Frederico Luis Gonçalves de Freitas, Federal University of Pernambuco, Brazil</i>	
<i>Eunice Palmeira da Silva, Federal University of Pernambuco, Brazil</i>	
<i>Ryan Ribeiro de Azevedo, Federal University of Pernambuco, Brazil</i>	
<i>Patricia Vieira da Silva Barros, Federal University of Pernambuco, Brazil</i>	
Exploiting Multilinguality for Creating Mappings between Thesauri	382
<i>Mauro Dragoni, Fondazione Bruno Kessler, Italy</i>	
Towards an Ontology Pattern Language for Harmonizing Software Process Related ISO Standards	388
<i>Fabiano B. Ruy, Federal University of Espírito Santo; Federal Institute of Espírito Santo, Brazil</i>	
<i>Ricardo A. Falbo, Federal University of Espírito Santo, Brazil</i>	
<i>Monalessa P. Barcellos, Federal University of Espírito Santo, Brazil</i>	
<i>Giancarlo Guizzardi, Federal University of Espírito Santo, Brazil</i>	
Horn-Rule based Compression Technique for RDF Data	396
<i>Gayathri V, Indian Institute of Technology Madras, India</i>	
<i>P. Sreenivasa Kumar, Indian Institute of Technology Madras, India</i>	

An Approach for Building Lexical-Semantic Resources based on Heterogeneous Information Sources	402
<i>José Gildo De Araújo Júnior, Federal University of Campina Grande, Brazil</i>	
<i>Ulrich Schiel, Federal University of Campina Grande, Brazil</i>	
<i>Leandro Balby Marinho, Federal University of Campina Grande, Brazil</i>	
A Supervised Learning Approach to Detect Subsumption Relations between Tags in Folksonomies	409
<i>Alex Sandro C. Rêgo, Inst. Federal de Educação da Paraíba; Univ. Federal de Campina Grande, Brazil</i>	
<i>Leandro Balby Marinho, Universidade Federal de Campina Grande, Brazil</i>	
<i>Carlos Eduardo S. Pires, Universidade Federal de Campina Grande, Brazil</i>	
High Throughput Indexing for Large-Scale Semantic Web Data	416
<i>Long Cheng, Technische Universität Dresden, Germany</i>	
<i>Spyros Kotoulas, IBM Research, Ireland</i>	
<i>Tomas E. Ward, National University of Ireland Maynooth, Ireland</i>	
<i>Georgios Theodoropoulos, Durham University, UK</i>	
Poster Paper	
A Supervised Machine Learning Approach for Taxonomic Relation Recognition through Non-Linear Enumerative Structures	423
<i>Jean-Philippe Fauconnier, Institut de Recherche en Informatique de Toulouse, France</i>	
<i>Mouna Kamel, Institut de Recherche en Informatique de Toulouse, France</i>	
<i>Bernard Rothenburger, Institut de Recherche en Informatique de Toulouse, France</i>	
Dependable and Adaptive Distributed Systems Track	
Track Co-Chairs:	Karl M. Goeschka, UAS Technikum Vienna, Austria
	Rui Oliveira, Universidade do Minho, Portugal
	Peter Pietzuch, Imperial College London, United Kingdom
	Giovanni Russello, University of Auckland, New Zealand
Track Editorial	426
Optimal Planning for Architecture-Based Self-Adaptation via Model Checking of Stochastic Games	428
<i>Javier Cámara, Carnegie Mellon University, USA</i>	
<i>David Garlan, Carnegie Mellon University, USA</i>	
<i>Bradley Schmerl, Carnegie Mellon University, USA</i>	
<i>Ashutosh Pandey, Carnegie Mellon University, USA</i>	
Modeling Dependable Systems with Continuous Time Bayesian Networks	436
<i>Martin Gröbbl, Heidelberg Institute for Theoretical Studies, Germany</i>	
Workload Characterization Model for Optimal Resource Allocation in Cloud Middleware	442
<i>Shruti Kunde, Xerox Research Center India, India</i>	
<i>Tridib Mukherjee, Xerox Research Center India, India</i>	
Evaluation of an Adaptive Framework for Resilient Monte Carlo Executions	448
<i>A.J. Rubio-Montero, CIEMAT, Spain</i>	
<i>M.A. Rodríguez-Pascual, CIEMAT, Spain</i>	
<i>R. Mayo-García, CIEMAT, Spain</i>	
A Taxonomy of Reliable Request-Response Protocols	456
<i>Naghmeah Ivaki, University of Coimbra, Portugal</i>	
<i>Nuno Laranjeiro, University of Coimbra, Portugal</i>	
<i>Filipe Araujo, University of Coimbra, Portugal</i>	

Poster Papers

Scalable Model for Dynamic Configuration and Power Management in Virtualized Heterogeneous Web Clusters 464

André F. Monteiro, Fluminense Federal University, Brazil

Orlando Loques, Fluminense Federal University, Brazil

An Experimental Evaluation of Machine-to-Machine Coordination Middleware 468

Filipe Campos, INESC TEC & University of Minho, Portugal

José Pereira, INESC TEC & University of Minho, Portugal

Parameterization of Fail-Operational Architectural Patterns 471

Dulcinea Penha, Fraunhofer-Inst. für Eingebettete Systeme und Kommunikationstechnik ESK, Germany

Gereon Weiss, Fraunhofer-Inst. für Eingebettete Systeme und Kommunikationstechnik ESK, Germany

Cooperative Systems Track

Track Co-Chairs: Rachid Anane, Coventry University, United Kingdom

Predictability in Human-Agent Cooperation: Adapting to Humans' Personalities 474

Sebastian Ahrndt, Technische Universität Berlin, Germany

Benjamin Breitung, Technische Universität Berlin, Germany

Johannes Fähndrich, Technische Universität Berlin, Germany

Sahin Albayrak, Technische Universität Berlin, Germany

A Dynamic-Adaptive Architecture for 3D Collaborative Virtual Environments based on Graphic Clusters 480

Diego R.C. Dias, Federal University of São Carlos, Brazil

Marcelo P. Guimarães, Federal University of São Paulo, Brazil

Torsten W. Kuhlen, RWTH Aachen University, Germany

Luis C. Trevelin, Federal University of São Carlos, Brazil

Cooperative Middleware Platform as a Service for Internet of Things Applications 488

Leonardo Albernaz Amaral, Catholic University of Rio Grande do Sul, Brazil

Ramão Tiago Tiburski, Catholic University of Rio Grande do Sul, Brazil

Everton de Matos, Catholic University of Rio Grande do Sul, Brazil

Fabiano Hessel, Catholic University of Rio Grande do Sul, Brazil

Meta-Strategy for Cooperative Tasks with Learning of Environments in Multi-Agent Continuous Tasks 494

Ayumi Sugiyama, Waseda University, Japan

Toshiharu Sugawara, Waseda University, Japan

Poster Papers

Rescheduling and Checkpointing as Strategies to Run Synchronous Parallel Programs on P2P Desktop Grids 501

Rodrigo da Rosa Righi, Unisinos, Brazil

Alexandre Veith, Unisinos, Brazil

Vinicius Facco Rodrigues, Unisinos, Brazil

Gustavo Rostirolla, Unisinos, Brazil

Cristiano André da Costa, Unisinos, Brazil

Kleinner Farias, Unisinos, Brazil

Antonio Marcos Alberti, Inatel, Brazil

Efficient Approach for Reusing and Sharing Train Driving Plans using Case-Based Reasoning 505

André P. Borges, Pontifícia Universidade Católica do Paraná, Brazil

Osmar B. Dordal, Pontifícia Universidade Católica do Paraná, Brazil

Denise M.V. Sato, Pontifícia Universidade Católica do Paraná, Brazil

Fabrcio Enembreck, Pontifícia Universidade Católica do Paraná, Brazil

Bráulio C. Ávila, Pontifícia Universidade Católica do Paraná, Brazil

Edson E. Scalabrin, Pontifícia Universidade Católica do Paraná, Brazil

Mobile Collaboration: A Collaborative Editing Service in the Cloud 509

Nadir Guetmi, LIAS/ISAE-ENSMA, Poitiers University, France

Moulay Driss Mechaoui, University of Sciences and Technology Oran 'Mohamed Boudiaf', Algeria

Abdessamad Imine, Université de Lorraine and INRIA-LORIA Grand Est, France

Ladjel Bellatreche, LIAS/ISAE-ENSMA, Poitiers University, France

Mobile Computing and Applications Track

Track Co-Chairs: Hong Va Leong, The Hong Kong Polytechnic University, Hong Kong, China

Alvin Chan, The Hong Kong Polytechnic University, Hong Kong, China

Track Editorial 513

Optimizing Network I/O Performance through Adaptive Hypercall Coalescing in Embedded Virtualization 515

Shuxin Cheng, Shanghai Jiao Tong University, China

Jianguo Yao, Shanghai Jiao Tong University, China

Fei Hu, Shanghai Jiao Tong University, China

Estimating Core Body Temperature based on Human Thermal Model using Wearable Sensors 521

Takashi Hamatani, Graduate School of Information Science and Technology, Japan

Akira Uchiyama, Graduate School of Information Science and Technology, Japan

Teruo Higashino, Graduate School of Information Science and Technology, Japan

Integrating Mobile Sensing and Social Network for Personalized Health-Care Application 527

Huan Li, Beihang University, China

Qi Zhang, Beihang University, China

Kejie Lu, University of Puerto Rico at Mayagüez, USA

A Context Simulator as Testing Support for Mobile Apps 535

Vaninha Vieira, Federal University of Bahia, Brazil

Konstantin Holl, Fraunhofer Institute for Experimental Software Engineering IESE, Germany

Michael Hassel, Mannheim University of Applied Sciences, Germany

Determining the Location of Buildings given a Single Picture, Environment Maps and Inaccurate GPS Coordinates 542

Jonas C. Sampaio, Federal Fluminense University, Brazil

Raphael S. Evangelista, Federal Fluminense University, Brazil

Leandro A.F. Fernandes, Federal Fluminense University, Brazil

On-Device Anomaly Detection for Resource-Limited Systems 548

Maroua Ben Attia, École de technologie supérieure, Canada

Chamseddine Talhi, École de technologie supérieure, Canada

Abdelwahab Hamou-Lhadj, Concordia University, Canada

Babak Khosravifar, École de technologie supérieure, Canada

Vincent Turpaud, École de technologie supérieure, Canada

Mario Couture, Research and Development Canada (DRDC), Canada

To Cloud or Not to Cloud: A Context-Aware Deployment Perspective of Augmented Reality Mobile Applications	555
<i>Nayyab Zia Naqvi, Katholieke Universiteit Leuven, Belgium</i>	
<i>Karel Moens, Katholieke Universiteit Leuven, Belgium</i>	
<i>Arun Ramakrishnan, Katholieke Universiteit Leuven, Belgium</i>	
<i>Davy Preuveneers, Katholieke Universiteit Leuven, Belgium</i>	
<i>Danny Hughes, Katholieke Universiteit Leuven, Belgium</i>	
<i>Yolande Berbers, Katholieke Universiteit Leuven, Belgium</i>	
 ubiMonitor: Intelligent Fusion of Body-Worn Sensors for Real-Time Human Activity Recognition	563
<i>Heba Aly, Alexandria University, Egypt</i>	
<i>Mohamed A. Ismail, Alexandria University, Egypt</i>	
 A Scheduler for Mobile Cloud based on Weighted Metrics and Dynamic Context Evaluation	569
<i>Francisco Airton Silva, Federal University of Pernambuco, Brazil</i>	
<i>Paulo Maciel, Federal University of Pernambuco, Brazil</i>	
<i>Gileno Filho, Federal University of Pernambuco, Brazil</i>	
<i>Rubens Matos, Federal University of Pernambuco, Brazil</i>	
 MpOS: A Multiplatform Offloading System	577
<i>Philipp B. Costa, Federal University of Ceará, Brazil</i>	
<i>Paulo A.L. Rego, Federal University of Ceará, Brazil</i>	
<i>Lincoln S. Rocha, Federal University of Ceará, Brazil</i>	
<i>Fernando A.M. Trinta, Federal University of Ceará, Brazil</i>	
<i>José N. De Souza, Federal University of Ceará, Brazil</i>	
 Poster Papers	
 Multi-Store Metadata-Based Supervised Mobile App Classification	585
<i>Giacomo Berardi, Istituto di Scienza e Tecnologie dell'Informazione, Consiglio Nazionale delle Ricerche, Italy</i>	
<i>Andrea Esuli, Istituto di Scienza e Tecnologie dell'Informazione, Consiglio Nazionale delle Ricerche, Italy</i>	
<i>Tiziano Fagni, Istituto di Scienza e Tecnologie dell'Informazione, Consiglio Nazionale delle Ricerche, Italy</i>	
<i>Fabrizio Sebastiani, Qatar Computing Research Institute, Qatar</i>	
 Using Fractal Clustering to Explore Behavioral Correlation: A New Approach to Reduce Energy Consumption in WSN	589
<i>Fernando Rodrigues, University of Fortaleza, Brazil</i>	
<i>Angelo Brayner, University of Fortaleza, Brazil</i>	
<i>Jose E. Bessa Maia, State University of Ceara, Brazil</i>	
 Performance Characterization and Scalable Design of Sensing-as-a-Service Platform	592
<i>Tridib Mukherjee, Xerox Research Center India, India</i>	
<i>Amit Kumar, Xerox Research Center India, India</i>	
<i>Deepthi Chander, Xerox Research Center India, India</i>	
<i>Koustuv Dasgupta, Xerox Research Center India, India</i>	
<i>Amandeep Chugh, Xerox Research Center India, India</i>	
<i>Anirban Mondal, Xerox Research Center India, India</i>	
 Towards Context-Aware Behaviour Generation	596
<i>Paulo Artur de Sousa Duarte, Federal University of Ceará, Brazil</i>	
<i>Felipe Mota Barreto, Federal University of Ceará, Brazil</i>	
<i>Francisco Anderson de Almada Gomes, Federal University of Ceará, Brazil</i>	
<i>Windson Viana de Carvalho, Federal University of Ceará, Brazil</i>	
<i>Fernando Antonio Mota Trinta, Federal University of Ceará, Brazil</i>	

Student Research Competition Paper

A New Layer of Security to Credit Card Payments with Mobile Device GPS	599
<i>Jussi Laakkonen, Lappeenranta University of Technology, Finland</i>	

Networking Track

Track Co-Chairs: Mario M. Freire, University of Beira Interior, Portugal
Marilia Curado, University of Coimbra, Portugal
Manuela Pereira, University of Beira Interior, Portugal
Teresa Vazão, IST/INESC ID Lisboa, Portugal

Track Editorial	601
------------------------------	-----

Content Placement in Heterogeneous End-to-End Virtual Networks	602
---	-----

Kostas Katsalis, University of Thessaly, Greece
Vasilis Sourlas, CERTH-ITI, Greece
Thanasis Papaioannou, CERTH-ITI, Greece
Thanasis Korakis, University of Thessaly, Greece
Leandros Tassioulas, Yale University, USA

HTTP over UDP: An Experimental Investigation of QUIC	609
---	-----

Gaetano Carlucci, Politecnico di Bari & Quavlive, Italy
Luca De Cicco, Politecnico di Bari & Quavlive, Italy
Saverio Mascolo, Politecnico di Bari & Quavlive, Italy

High Speed Network Impacts and Power Consumption Estimation for Cloud Data Centers	615
---	-----

Daniel Lago, University of Campinas, Brazil
Edmundo Madeira, University of Campinas, Brazil
Deep Medhi, University of Missouri, Kansas City, USA

Energy Harvesting based Protection of Border Surveillance Systems	621
--	-----

Nourhene Ellouze, University of Carthage, Tunisia
Slim Rekhis, University of Carthage, Tunisia
Noureddine Boudriga, University of Carthage, Tunisia

Feasibility of Information-Centric Networking Integration into LTE Mobile Networks	627
---	-----

Andre Gomes, University of Bern, Switzerland
Torsten Braun, University of Bern, Switzerland

Translating Full Duplexity into Capacity Gains for the High-Priority Traffic Classes of IEEE 802.11	634
--	-----

Saulo Queiroz, Federal University of Technology, Parana; Federal University of Parana, Brazil
Roberto Hexsel, Federal University of Parana, Brazil

Refactoring Internet of Things Middleware through Software-Defined Network	640
---	-----

Lucas M.R. Arbiza, Federal University of Rio Grande do Sul, Brazil
Leandro M. Bertholdo, Federal University of Rio Grande do Sul, Brazil
Carlos Raniery P. dos Santos, Federal University of Rio Grande do Sul, Brazil
Lisandro Z. Granville, Federal University of Rio Grande do Sul, Brazil
Liane M.R. Tarouco, Federal University of Rio Grande do Sul, Brazil

Effective Multicast Messaging for Kademlia Network	646
---	-----

Lubos Matl, Czech Technical University, Czech Republic
Tomas Cerny, Czech Technical University, Czech Republic
Michael J. Donahoo, Baylor University, USA

Designing Network Servers within a Hierarchical Scheduling Framework	653
---	-----

Zahid Iqbal, University of Porto, Portugal

Luis Almeida, University of Porto, Portugal

Moris Behnam, Mälardalen University Västerås, Sweden

Poster Papers

QoS Prediction for Network Data Traffic using Hierarchical Modified Regularized Least Squares Rough Support Vector Regression	659
--	-----

Arindam Chaudhuri, Samsung R&D Institute Delhi, India

Soumya Maity, Indian Institute of Technology Kharagpur, India

Soumya K. Ghosh, Indian Institute of Technology Kharagpur, India

A Solution to the MCSP Problem Considering Physical Layer Degradations in Transparent Optical Networks	662
---	-----

Alexandre Fontinele, Federal University of Piauí, Brazil

Iallen Santos, Federal University of Piauí, Brazil

André Soares, Federal University of Piauí, Brazil

José Maranhão, University of Campinas, Brazil

Felipe Mazullo, Tsukuba University, Japan

From Software Defined Network to Network Defined for Software	665
--	-----

Celio Trois, Federal University of Paraná, Brazil

Magnos Martinello, Federal University of Espírito Santo, Brazil

Luis C.E. de Bona, Federal University of Paraná, Brazil

Marcos D. Del Fabro, Federal University of Paraná, Brazil

Feedback Management for Scaling Clients in Streaming Multicast	669
---	-----

Julio Cano, University of Porto, Portugal

Luis Almeida, Mälardalen University, Sweden

Wireless Communications and Networking Track

Track Co-Chairs: Dongkyun Kim, Kyungpook National University, Korea

Wei Wang, San Diego State University, USA

Track Editorial	672
------------------------------	-----

Channel and Power Allocation Algorithm to Optimize the Performance of Large WLANs	673
--	-----

Marcelo Riedi, University of Parana, Brazil

Giovanna G. Basilio, University of Parana, Brazil

Marcelo E. Pellenz, Pontifícia Universidade Católica do Paraná, Brazil

Manoel C. Penna, Pontifícia Universidade Católica do Paraná, Brazil

Edgard Jamhour, Pontifícia Universidade Católica do Paraná, Brazil

Richard D. Souza, University of Parana, Brazil

Hermes I. Del Monego, University of Parana, Brazil

Performance Evaluation of Heterogeneous Wireless Networks Considering Competing Objectives and Viewpoints	680
--	-----

Jason B. Ernst, University of Guelph, Canada

Stefan C. Kremer, University of Guelph, Canada

Joel J.P.C. Rodrigues, University of Beira Interior, University ITMO, Portugal, Russia

A Source-Location Privacy Protection Strategy via Pseudo Normal Distribution-Based Phantom Routing in WSNs	688
<i>Jun Huang, Chongqing University of Posts and Telecommunications, China</i>	
<i>Meisong Sun, Chongqing University of Posts and Telecommunications, China</i>	
<i>Shitong Zhu, Chongqing University of Posts and Telecommunications, China</i>	
<i>Yi Sun, Chongqing University of Posts and Telecommunications, China</i>	
<i>Cong-cong Xing, Nicholls State University, USA</i>	
<i>Qiang Duan, The Pennsylvania State University, USA</i>	
Vehicular Content Centric Network (VCCN): A Survey and Research Challenges	695
<i>Safdar H. Bouk, Kyungpook National University, Republic of Korea</i>	
<i>Syed Hassan Ahmed, Kyungpook National University, Republic of Korea</i>	
<i>Dongkyun Kim, Kyungpook National University, Republic of Korea</i>	
Statistical, Forecasting and Metaheuristic Techniques for Network Anomaly Detection	701
<i>Gilberto Fernandes Jr., University of Beira Interior, Portugal</i>	
<i>Eduardo H.M. Pena, State University of Londrina, Brazil</i>	
<i>Luiz F. Carvalho, State University of Londrina, Brazil</i>	
<i>Joel J.P.C. Rodrigues, University of Beira Interior, Portugal</i>	
<i>Mario L. Proença Jr., State University of Londrina, Brazil</i>	
RSSI-Based Localization of a Wireless Sensor Node with a Flying Robot	708
<i>Frank Bohdanowicz, University of Koblenz-Landau, Germany</i>	
<i>Hannes Frey, University of Koblenz-Landau, Germany</i>	
<i>Rafael Funke, University of Koblenz-Landau, Germany</i>	
<i>Dominik Mosen, University of Koblenz-Landau, Germany</i>	
<i>Florentin Neumann, University of Koblenz-Landau, Germany</i>	
<i>Ivan Stojmenović, Deakin University and University of Ottawa, Australia and Canada</i>	
Poster Paper	
Interference Aware Channel Assignment for Structured Wireless Sensor Networks	716
<i>E. Jamhour, University of Parana, Brazil</i>	
<i>M.E. Pellenz, University of Parana, Brazil</i>	
<i>M.C. Penna, University of Parana, Brazil</i>	
<i>R.D. Souza, University of Parana, Brazil</i>	
<i>G. Brante, University of Parana, Brazil</i>	
Student Research Competition Paper	
Multi-Criteria based Vertical Handover Decision in Heterogeneous Wireless Network	720
<i>Murad Khan, Kyungpook National University, Korea</i>	
Web Technologies Track	
Track Co-Chairs: Angelo Di Iorio, University of Bologna, Italy	
Davide Rossi, University of Bologna, Italy	
Stefano Zacchioli, Université Paris Diderot - Paris 7, France	
Track Editorial	722
Generating XML Data for XPath Queries	724
<i>Dušan Rychnovský, Charles University in Prague, Czech Republic</i>	
<i>Irena Holubová, Charles University in Prague, Czech Republic</i>	

Bing-SF-IDF+: A Hybrid Semantics-Driven News Recommender	732
<i>Michel Capelle, Erasmus University Rotterdam, The Netherlands</i>	
<i>Marnix Moerland, Erasmus University Rotterdam, The Netherlands</i>	
<i>Frederik Hogenboom, Erasmus University Rotterdam, The Netherlands</i>	
<i>Flavius Frasinca, Erasmus University Rotterdam, The Netherlands</i>	
<i>Damir Vandić, Erasmus University Rotterdam, The Netherlands</i>	
Efficient Approximate Thompson Sampling for Search Query Recommendation	740
<i>Chu-Cheng Hsieh, eBay, Inc., USA</i>	
<i>James Neufeld, University of Alberta, Edmonton, Canada</i>	
<i>Tracy King, eBay, Inc., USA</i>	
<i>Junghoo Cho, University of California, Los Angeles, USA</i>	
Locating Domain-Specific Contents and Experts on Social Bookmarking Communities	747
<i>Simon Kassing, Delft University of Technology, The Netherlands</i>	
<i>Jasper Oosterman, Delft University of Technology, The Netherlands</i>	
<i>Alessandro Bozzon, Delft University of Technology, The Netherlands</i>	
<i>Geert-Jan Houben, Delft University of Technology, The Netherlands</i>	
Web Page Segmentation Evaluation	753
<i>Andrés Sanoja, Université Pierre et Marie Curie, France</i>	
<i>Stéphane Gançarski, Université Pierre et Marie Curie, France</i>	
Multi-Component Similarity Method for Web Product Duplicate Detection	761
<i>Ronald van Bezu, Erasmus University Rotterdam, The Netherlands</i>	
<i>Sjoerd Borst, Erasmus University Rotterdam, The Netherlands</i>	
<i>Rick Rijkse, Erasmus University Rotterdam, The Netherlands</i>	
<i>Jim Verhagen, Erasmus University Rotterdam, The Netherlands</i>	
<i>Damir Vandić, Erasmus University Rotterdam, The Netherlands</i>	
<i>Flavius Frasinca, Erasmus University Rotterdam, The Netherlands</i>	
Handling Flash-Crowd Events to Improve the Performance of Web Applications	769
<i>Ubiratam de Paula Junior, Fluminense Federal University, Brazil</i>	
<i>Lúcia M.A. Drummond, Fluminense Federal University, Brazil</i>	
<i>Daniel de Oliveira, Fluminense Federal University, Brazil</i>	
<i>Yuri Frota, Fluminense Federal University, Brazil</i>	
<i>Valmir C. Barbosa, Federal University of Rio de Janeiro, Brazil</i>	
Automated Generation of Visual Web Tests from DOM-Based Web Tests	775
<i>Maurizio Leotta, Università di Genova, Italy</i>	
<i>Andrea Stocco, Università di Genova, Italy</i>	
<i>Filippo Ricca, Università di Genova, Italy</i>	
<i>Paolo Tonella, Fondazione Bruno Kessler, Italy</i>	
Leveraging Task-Based Data to Support Functional Testing of Web Applications	783
<i>Flávio Rezende de Jesus, Federal University of Itajuba, Brazil</i>	
<i>Leandro Guarino de Vasconcelos, National Institute for Space Research, Brazil</i>	
<i>Laércio A. Baldochi Jr., Federal University of Itajuba, Brazil</i>	
Security Assessment of Clickjacking Risks in Web Applications: Metrics based Approach	791
<i>Hossain Shahriar, Kennesaw State University, USA</i>	
<i>Hisham Haddad, Kennesaw State University, USA</i>	

Poster Papers

Migratom.js: A Javascript Migration Framework for Distributed Web Computing and Mobile Devices 798

Tai-Lun Tseng, National Taiwan University, Taiwan
Shih-Hao Hung, National Taiwan University, Taiwan
Chia-Heng Tu, Institute for Information Industry, Taiwan

Serena: Scalable Middleware for Real-Time Web Applications 802

Kennedy Kambona, Vrije Universiteit Brussel, Belgium
Elisa Gonzalez Boix, Vrije Universiteit Brussel, Belgium
Wolfgang De Meuter, Vrije Universiteit Brussel, Belgium

Catalogue: Graph Representation of File Relations for a Globally Distributed Environment 806

Yamato Miyashita, Graduate School of Science and Technology Keio University, Japan
Hiroyo Ishikawa, Keio University, Japan
Fumio Teraoka, Keio University, Japan
Kunitake Kaneko, Keio University, Japan

RE-CMS: A Reverse Engineering Toolkit for the Migration to CMS-Based Web Applications 810

Feliu Trias, Kybele Research Group, Spain
Valeria de Castro, Kybele Research Group, Spain
Marcos López-Sanz, Kybele Research Group, Spain
Esperanza Marcos, Kybele Research Group, Spain

Data Mining Track

Track Co-Chairs: Hasan Jamil, University of Idaho, USA
Raymond Wong, University of New South Wales, Australia
Stefan Kramer, Johannes Gutenberg University - Mainz, Germany

Locality-Preserving L1-Graph and its Application in Clustering 813

Shuchu Han, Stony Brook University, USA
Hao Huang, Stony Brook University, USA
Hong Qin, Stony Brook University, USA
Dantong Yu, Brookhaven National Lab, USA

A Joint Model for Topic-Sentiment Modeling from Text 819

Mohamed Dermouche, AMI Software, and Université de Lyon, France
Leila Khouas, AMI Software R&D, France
Julien Velcin, Université de Lyon, France
Sabine Loudcher, Université de Lyon, France

Computationally-Efficient Classification of HEp-2 Cell Patterns in IIF Images 825

Luis Fernando Planella Gonzalez, Pontifical Catholic University of Rio Grande do Sul, Brazil
Duncan Dubugras Alcoba Ruiz, Pontifical Catholic University of Rio Grande do Sul, Brazil
Márcio Sarroglia Pinho, Pontifical Catholic University of Rio Grande do Sul, Brazil

Semi-Supervised Clustering using Multi-Assistant-Prototypes to Represent each Cluster 831

Walter J. Silva, Universidade Federal de Uberlândia, Brazil
Maria Camila N. Barioni, Universidade Federal de Uberlândia, Brazil
Sandra de Amo, Universidade Federal de Uberlândia, Brazil
Humberto L. Razente, Universidade Federal de Uberlândia, Brazil

Approximate Block Coordinate Descent for Large Scale Hierarchical Classification	837
<i>Anveshi Charuvaka, George Mason University, USA</i>	
<i>Huzefa Rangwala, George Mason University, USA</i>	
Bias-Aware Lexicon-Based Sentiment Analysis	845
<i>Mohsin Iqbal, University of the Punjab, Pakistan</i>	
<i>Asim Karim, Lahore University of Management Sciences, Pakistan</i>	
<i>Faisal Kamiran, University of the Punjab, Pakistan</i>	
Key Correlation Mining by Simultaneous Monotone and Anti-Monotone Constraints Checking	851
<i>Souad Bouasker, University of Tunis ElManar, Tunisia</i>	
<i>Sadok Ben Yahia, University of Tunis ElManar, Tunisia</i>	
FOSHU: Faster On-Shelf High Utility Itemset Mining – With or without Negative Unit Profit	857
<i>Philippe Fournier-Viger, University of Moncton, Canada</i>	
<i>Souleymane Zida, University of Moncton, Canada</i>	
Multi-View Learning with Dependent Views	865
<i>Ulf Brefeld, TU Darmstadt, Germany</i>	
Alternating Model Trees	871
<i>Eibe Frank, University of Waikato, New Zealand</i>	
<i>Michael Mayo, University of Waikato, New Zealand</i>	
<i>Stefan Kramer, University of Mainz, Germany</i>	
Accelerating Recommender Systems using GPUs	879
<i>André Valente Rodrigues, University of Porto, Portugal</i>	
<i>Alípio Jorge, University of Porto, Portugal</i>	
<i>Inês Dutra, University of Porto, Portugal</i>	
On the Spectrum between Binary Relevance and Classifier Chains in Multi-Label Classification	885
<i>Sophie Burkhardt, Johannes Gutenberg University Mainz, Germany</i>	
<i>Stefan Kramer, Johannes Gutenberg University Mainz, Germany</i>	
EP-MEANS: An Efficient Nonparametric Clustering of Empirical Probability Distributions	893
<i>Keith Henderson, Lawrence Livermore National Laboratory, USA</i>	
<i>Brian Gallagher, Lawrence Livermore National Laboratory, USA</i>	
<i>Tina Eliassi-Rad, Rutgers University, USA</i>	
On the Discovery of Fake Binary Ratings	901
<i>Murat Okkalioglu, Yalova University, Turkey</i>	
<i>Mehmet Koc, Bilecik Seyh Edebali University, Turkey</i>	
<i>Huseyin Polat, Anadolu University, Turkey</i>	
Sequence Mining under Multiple Constraints	908
<i>Nicolas Béchet, Université de Bretagne Sud - IRISA, France</i>	
<i>Peggy Cellier, INSA de Rennes - IRISA, France</i>	
<i>Thierry Charnois, Université Paris 13 - LIPN, France</i>	
<i>Bruno Crémilleux, Université de Caen Basse-Normandie, France</i>	

Poster Papers

Exploring Multiple Clusterings in Attributed Graphs	915
<i>Gustavo Paiva Guedes, Federal Center of Technological Education of Rio de Janeiro, Brazil</i>	
<i>Eduardo Ogasawara, Federal Center of Technological Education of Rio de Janeiro, Brazil</i>	
<i>Eduardo Bezerra, Federal Center of Technological Education of Rio de Janeiro, Brazil</i>	
<i>Geraldo Xexéo, Federal University of Rio de Janeiro, Brazil</i>	

Upper Bounds to Expected Support for Frequent Itemset Mining of Uncertain Big Data	919
<i>Alfredo Cuzzocrea, ICAR-CNR & University Calabria, Italy</i>	
<i>Carson K. Leung, University of Manitoba, Canada</i>	

Semantically Enriching Text Representation Model for Document Clustering	922
<i>Han-joon Kim, University of Seoul, Korea</i>	
<i>Kee-Joo Hong, University of Seoul, Korea</i>	
<i>Jae Young Chang, Hansung University, Korea</i>	

ZBLP: A Parameter-Less Label Propagation Algorithm on Stereo Videos	926
<i>Chongsheng Zhang, Henan University, China</i>	
<i>JingJun Bi, Henan University, China</i>	
<i>Changchang Liu, Henan University, China</i>	

Student Research Competition Papers

Improve General Contextual SLIM Recommendation Algorithms by Factorizing Contexts	929
<i>Yong Zheng, DePaul University, USA</i>	

A Fast Support Vector Data Description System for Anomaly Detection using Big Data	931
<i>Rekha A G, IIMK, India</i>	

Data Streams Track

Track Co-Chairs: Albert Bifet, Yahoo! Research Barcelona, Spain
Shonali Krishnaswamy, Monash University, Australia
João Gama, LIAAD-University Porto, Portugal

Track Editorial	933
------------------------------	-----

SNCStream: A Social Network-Based Data Stream Clustering Algorithm	935
<i>Jean Paul Barddal, Pontifícia Universidade Católica do Paraná, Brazil</i>	
<i>Heitor Murilo Gomes, Pontifícia Universidade Católica do Paraná, Brazil</i>	
<i>Fabício Enembreck, Pontifícia Universidade Católica do Paraná, Brazil</i>	

Pairwise Combination of Classifiers for Ensemble Learning on Data Streams	941
<i>Heitor Murilo Gomes, Pontifícia Universidade Católica do Paraná, Brazil</i>	
<i>Jean Paul Barddal, Pontifícia Universidade Católica do Paraná, Brazil</i>	
<i>Fabício Enembreck, Pontifícia Universidade Católica do Paraná, Brazil</i>	

Forgetting Methods for Incremental Matrix Factorization in Recommender Systems	947
<i>Pawel Matuszyk, Otto-von-Guericke-University Magdeburg, Germany</i>	
<i>João Vinagre, Universidade do Porto, Portugal</i>	
<i>Myra Spiliopoulou, Otto-von-Guericke-University Magdeburg, Germany</i>	
<i>Alípio Mário Jorge, Universidade do Porto, Portugal</i>	
<i>João Gama, Universidade do Porto, Portugal</i>	

Deep Learning in Partially-Labeled Data Streams	954
<i>Jesse Read, Aalto University and HIIT, Finland</i>	
<i>Fernando Perez-Cruz, Universidad Carlos III, Spain</i>	
<i>Albert Bifet, Huawei Noah's Ark Lab, Hong Kong</i>	

Poster Papers

Visualization of Evolving Large Scale Ego-Networks	960
<i>Rui Sarmiento, LIAAD/INESC TEC, Portugal</i>	
<i>Mário Cordeiro, LIAAD/INESC TEC, Portugal</i>	
<i>João Gama, LIAAD/INESC TEC, Portugal</i>	

Collaborative Filtering with Recency-Based Negative Feedback	963
<i>João Vinagre, Universidade do Porto, Portugal</i>	
<i>Alípio Mário Jorge, Universidade do Porto, Portugal</i>	
<i>João Gama, Universidade do Porto, Portugal</i>	

Database Theory, Technology and Applications Track

Track Co-Chairs: Junping Sun, Nova Southeastern University, USA
Ramzi A. Haraty, Lebanese American University, Lebanon
Apostolos Papadopoulos, Aristotle University, Greece

Track Editorial	966
------------------------------	-----

Performance Prediction for Set Similarity Joins	967
<i>Christiane Faleiro Sidney, Federal University of Lavras, Brazil</i>	
<i>Diego Sarmiento Mendes, Federal University of Lavras, Brazil</i>	
<i>Leonardo Andrade Ribeiro, Federal University of Goiás, Brazil</i>	
<i>Theo Härder, University of Kaiserslautern, Germany</i>	

HB+tree: Use Hadoop and HBase even Your Data isn't that Big	973
<i>Athanasios Kaplanis, University of Patras, Greece</i>	
<i>Marios Kendea, University of Patras, Greece</i>	
<i>Spyros Sioutas, Ionian University, Greece</i>	
<i>Christos Makris, University of Patras, Greece</i>	
<i>Giannis Tzimas, Technological Educational Institute of Western Greece, Greece</i>	

Adaptive Sorted Neighborhood Blocking for Entity Matching with MapReduce	981
<i>Demetrio Gomes Mestre, Federal University of Campina Grande, Brazil</i>	
<i>Carlos Eduardo Pires, Federal University of Campina Grande, Brazil</i>	
<i>Dimas C. Nascimento, Federal University of Campina Grande, Brazil</i>	

Bt-Join: A Join Operator for Asymmetric Storage Device	988
<i>Neusa L. Evangelista, University of Fortaleza, Brazil</i>	
<i>José de Aguiar M. Filho, University of Fortaleza, Brazil</i>	
<i>Angelo Brayner, University of Fortaleza, Brazil</i>	
<i>Namom Alencar, University of Fortaleza, Brazil</i>	

Combine-and-Conquer: Improving the Diversity in Similarity Search through Influence Sampling 994

Lucio F.D. Santos, University of São Paulo, Brazil

Willian D. Oliveira, University of São Paulo, Brazil

Luiz O. Carvalho, University of São Paulo, Brazil

Monica R.P. Ferreira, University of São Paulo, Brazil

Agma J.M. Traina, University of São Paulo, Brazil

Caetano Traina Jr., University of São Paulo, Brazil

A Framework for Investigating the Performance of Sum Aggregations Over Encrypted Data Warehouses 1000

Claudian Cruz Lopes, Federal University of Pernambuco, Brazil

Valéria Cesário Times, Federal University of Pernambuco, Brazil

Personalized Recommendation of SOLAP Queries: Theoretical Framework and Experimental Evaluation 1008

Saida Aissi, High Institute of Management, Tunisia

Mohamed Salah Gouider, High Institute of Management, Tunisia

Tarek Sboui, Université Laval, Tunisia

Lamjed Ben Said, High Institute of Management, Tunisia

An ETL Optimization Framework using Partitioning and Parallelization 1015

Xiufeng Liu, University of Waterloo, Canada

Nadeem Iftikhar, University College of Northern Denmark, Denmark

Parallel Similarity Search based on the Dimensions Value Cardinalities of Image Descriptor Vectors 1023

Dimitrios Rafailidis, Aristotle University of Thessaloniki, Greece

Yannis Manolopoulos, Aristotle University of Thessaloniki, Greece

Information Access and Retrieval Track

Track Co-Chairs: Gloria Bordogna, CNR, Italy

Gabriella Pasi, Univ. Milano Bicocca, Italy

Towards a Feature-Rich Data Set for Personalized Access to Long-Tail Content 1031

Christin Seifert, University of Passau, Germany

Jörg Schlötterer, University of Passau, Germany

Michael Granitzer, University of Passau, Germany

Real-Time Recommendations for User-Item Streams 1039

Andreas Lommatzsch, TU Berlin, Germany

Sahin Albayrak, TU Berlin, Germany

GoSim : A Tool for flexible Preference-Driven Group Formation 1047

Yves Mouafo, LIAS ENSMA, France

Zoé Faget, LIAS ENSMA, France

Allel Hadjali, LIAS ENSMA, France

Classifying Websites by Industry Sector: A Study in Feature Design 1053

Giacomo Berardi, Istituto di Scienza e Tecnologie dell'Informazione, Consiglio Nazionale delle Ricerche, Italy

Andrea Esuli, Istituto di Scienza e Tecnologie dell'Informazione, Consiglio Nazionale delle Ricerche, Italy

Tiziano Fagni, Istituto di Scienza e Tecnologie dell'Informazione, Consiglio Nazionale delle Ricerche, Italy

Fabrizio Sebastiani, Qatar Computing Research Institute, Qatar

A Sentiment-Based item Description Approach for kNN Collaborative Filtering	1060
<i>Rafael M. D'Addio, University of São Paulo, Brazil</i>	
<i>Marcelo G. Manzato, University of São Paulo, Brazil</i>	
On the Impact of Entity Linking in Microblog Real-Time Filtering	1066
<i>Giacomo Berardi, ISTI-CNR, Italy</i>	
<i>Diego Ceccarelli, ISTI-CNR, Italy</i>	
<i>Andrea Esuli, ISTI-CNR, Italy</i>	
<i>Diego Marcheggiani, ISTI-CNR, Italy</i>	
Column-Specific Context Extraction for Web Tables	1072
<i>Katrin Braunschweig, Technische Universität Dresden, Germany</i>	
<i>Maik Thiele, Technische Universität Dresden, Germany</i>	
<i>Julian Eberius, Technische Universität Dresden, Germany</i>	
<i>Wolfgang Lehner, Technische Universität Dresden, Germany</i>	
A Universal Topic Framework (UniZ) and Its Application in Online Search	1078
<i>Youngchul Cha, Microsoft, USA</i>	
<i>Keng-hao Chang, Microsoft, USA</i>	
<i>Hari Bommaganti, Microsoft, USA</i>	
<i>Ye Chen, Microsoft, USA</i>	
<i>Tak Yan, Microsoft, USA</i>	
<i>Bin Bi, UCLA, USA</i>	
<i>Junghoo Cho, UCLA, USA</i>	
BranchGuide: An Indexing Technique for Efficient, Lossless Processing of Branching Path Queries	1086
<i>Talles Brito, Federal Institute of Education, Science and Technology of Ceará, Brazil</i>	
<i>Gledson Elias, Federal University of Paraíba, Brazil</i>	
Leveraging Temporal Expressions to Filter Vital Documents Related to an Entity	1093
<i>Rafik Abbes, University of Toulouse, France</i>	
<i>Karen Pinel-Sauvagnat, University of Toulouse, France</i>	
<i>Nathalie Hernandez, University of Toulouse, France</i>	
<i>Mohand Boughanem, University of Toulouse, France</i>	
Exploring Graph Topology via Matrix Factorization to Improve Wikification	1099
<i>Raoni Ferreira, Universidade de São Paulo, Brazil</i>	
<i>Maria da Graça Campos Pimentel, Universidade de São Paulo, Brazil</i>	
<i>Marco Cristo, Universidade Federal do Amazonas - Instituto de Computação, Brazil</i>	

Poster Paper

Applying Multi-View based Metadata in Personalized Ranking for Recommender Systems	1105
<i>Marcos A. Domingues, University of São Paulo, Brazil</i>	
<i>Camila V. Sundermann, University of São Paulo, Brazil</i>	
<i>Flávio M.M. Barros, Faculdade de Engenharia Agrícola, Brazil</i>	
<i>Marcelo Garcia Manzato, University of São Paulo, Brazil</i>	
<i>Maria G.C. Pimentel, University of São Paulo, Brazil</i>	
<i>Solange O. Rezende, University of São Paulo, Brazil</i>	
<i>Stanley Oliveira, Embrapa Informática Agropecuária, Brazil</i>	

Student Research Competition Papers

From Context to Query 1108
Jörg Schlotterer, University of Passau, Germany

Multi-Document Text Summarization for Competitor Intelligence: A Methodology based on Topic Identification and Artificial Bee Colony Optimization 1110
Swapnajit Chakraborti, Indian Institute of Management Indore, India

Experience in Item based Recommender System 1112
Ankit Chaudhary, Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India

Social Network and Media Analysis Track

Track Co-Chairs: Sang-Wook Kim, Hanyang University, Korea

Track Editorial 1115

An ILS Algorithm to Evaluate Structural Balance in Signed Social Networks 1117
Mario Levorato, Fluminense Federal University, Brazil
Lucia Drummond, Fluminense Federal University, Brazil
Yuri Frota, Fluminense Federal University, Brazil
Rosa Figueiredo, University of Avignon, France

Modelling Consumers Decision-Making Process about Excluding Products as a Result of Mutual Influence 1123
Vinicius Nonnenmacher, Universidade do Vale do Rio dos Sinos, Brazil
Luiz Paulo Luna de Oliveira, Universidade do Vale do Rio dos Sinos, Brazil
Bardo E.J. Bodmann, Universidade Federal do Rio Grande do Sul, Brazil
Marta Becker Villamil, Universidade do Vale do Rio dos Sinos, Brazil

Multimodal Graph-Based Analysis over the DBLP Repository: Critical Discoveries and Hypotheses ... 1129
Gabriel P. Gimenes, University of São Paulo, Brazil
Hugo Galdron, University of São Paulo, Brazil
Jose F. Rodrigues Jr., University of São Paulo, Brazil
Mario Gazziro, Federal University of Santo Andre, Brazil

A Naïve Bayes Model based on Overlapping Groups for Link Prediction in Online Social Networks ... 1136
Jorge Valverde-Rebaza, University of São Paulo, Brazil
Alan Valejo, University of São Paulo, Brazil
Lilian Berton, University of São Paulo, Brazil
Thiago de Paulo Faleiros, University of São Paulo, Brazil
Alneu de Andrade Lopes, University of São Paulo, Brazil

Authorship Contribution Dynamics on Publication Venues in Computer Science: An Aggregated Quality Analysis 1142
Thiago H.P. Silva, Universidade Federal de Minas Gerais, Brazil
Mirella M. Moro, Universidade Federal de Minas Gerais, Brazil
Ana Paula C. Silva, Universidade Federal de Minas Gerais, Brazil

An Effective Approach to Group Recommendations based on Belief Propagation 1148
Irfan Ali, Hanyang University, Korea
Sang-Wook Kim, Hanyang University, Korea

An Evolutionary Game Model for the Spread of Non-Cooperative Behavior in Online Social Networks ... 1154
Sarah Rajtmajer, The Pennsylvania State University, USA
Christopher Griffin, The Pennsylvania State University, USA
Derek Mikesell, The Pennsylvania State University, USA
Anna Squicciarini, The Pennsylvania State University, USA

Community Detection, with Lower Time Complexity, using Coupled Kuramoto Oscillators 1160
João E.M. de Oliveira, Federal University of São Paulo, Brazil
Marcos G. Quiles, Federal University of São Paulo, Brazil
Marcos D.N. Maia, National Institute For Space Research, Brazil
Elbert E.N. Macau, National Institute For Space Research, Brazil

Predicting Well-Being with Geo-Referenced Data Collected from Social Media Platforms 1167
João Loff, IST /INESC-ID, Portugal
Manuel Reis, IST /INESC-ID, Portugal
Bruno Martins, IST / INESC-ID, Portugal

Classification of Twitter Follow Links based on the Followers' Intention 1174
Hikaru Takemura, Kyoto University, Japan
Atsushi Tanaka, Mainichi Broadcasting System, Inc., Japan
Keishi Tajima, Kyoto University, Japan

Poster Papers

Multi-Stage Seed Selection for Viral Marketing 1181
Anastasia Mochalova, Katholische Universität Eichstätt-Ingolstadt, Germany
Alexandros Nanopoulos, Katholische Universität Eichstätt-Ingolstadt, Germany

Web Accessibility in Social Networking Services: Blind Users Perspective 1184
Janaína R. Loureiro, Federal University of Mato Grosso do Sul, Brazil
Maria Istela Cagnin, Federal University of Mato Grosso do Sul, Brazil
Débora M.B. Paiva, Federal University of Mato Grosso do Sul, Brazil

Volume II: Software Development, System Software and Security

Enterprise Engineering Track

Track Co-Chairs: Artur Caetano, University of Lisbon, Portugal
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Rafael Accorsi, University of Freiburg, Germany
Ulrich Frank, University of Duisburg-Essen, Germany

Track Editorial 1187

Using ArchiMate to Model a Process Assessment Framework 1189
Nuno Silva, Universidade de Lisboa, Portugal
Miguel Mira da Silva, Universidade de Lisboa, Portugal
Béatrix Barafort, CRP Henri Tudor, Luxembourg
Marco Vicente, Universidade de Lisboa, Portugal
Pedro Sousa, Universidade de Lisboa, Portugal

Using Event Logs and the Ψ-Theory to Analyse Business Processes	1195
<i>Pedro Linares Pinto, Universidade de Lisboa, Portugal</i>	
<i>Carlos Mendes, INOV - Inesc Inovação, Portugal</i>	
<i>Miguel Mira da Silva, Universidade de Lisboa, Portugal</i>	
<i>Artur Caetano, Universidade de Lisboa, Portugal</i>	
Runtime Detection of Business Process Compliance Violations: An Approach based on Anti Patterns	1203
<i>Ahmed Awad, Cairo University, Egypt</i>	
<i>Ahmed Barnawi, King Abdulaziz University, Saudi Arabia</i>	
<i>Amal Elgammal, Cairo University, Egypt</i>	
<i>Radwa Elshawi, Princess Nourah Bint Abdulrahman University, Saudi Arabia</i>	
<i>Abduallah Almalaise, King Abdulaziz University, Saudi Arabia</i>	
<i>Sherif Sakr, King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia</i>	
Modelling Strategy with ArchiMate	1211
<i>Adina Aldea, University of Twente, The Netherlands</i>	
<i>Maria-Eugenia Jacob, University of Twente, The Netherlands</i>	
<i>Jos van Hillegersberg, University of Twente, The Netherlands</i>	
<i>Dick Quartel, BiZZdesign, The Netherlands</i>	
<i>Lianne Bodenstaff, BiZZdesign, The Netherlands</i>	
<i>Henry Franken, BiZZdesign, The Netherlands</i>	
SLA Composition in Service Networks: A Tool for Representing Relationships between SLAs and Contracts	1219
<i>Marco Zappatore, University of Salento, Italy</i>	
<i>Antonella Longo, University of Salento, Italy</i>	
<i>Mario A. Bochicchio, University of Salento, Italy</i>	
Matching of Events and Activities – An Approach based on Behavioral Constraint Satisfaction	1225
<i>Thomas Baier, University of Potsdam, Germany</i>	
<i>Andreas Rogge-Solti, Wirtschaftsuniversität Wien, Austria</i>	
<i>Jan Mendling, Wirtschaftsuniversität Wien, Austria</i>	
<i>Mathias Weske, University of Potsdam, Germany</i>	
Mining Processes with Multi-Instantiation	1231
<i>Ingo Weber, NICTA & University of New South Wales, Australia</i>	
<i>Mostafa Farshchi, NICTA & Swinburne University of Technology, Australia</i>	
<i>Jan Mendling, Wirtschaftsuniversitaet Wien, Austria</i>	
<i>Jean-Guy Schneider, Swinburne University of Technology, Australia</i>	
Poster Papers	
Classification Model for Predicting Cost Slippage in Governmental ICT Projects	1238
<i>Christos Makris, University of Patras, Greece</i>	
<i>Pantelis Vikatos, University of Patras, Greece</i>	
<i>Joost Visser, Software Improvement Group & Radboud University Nijmegen, The Netherlands</i>	
A Conceptual Framework for Enterprise Agility	1242
<i>Joshua Chibuike Nwokeji, Middlesex University London, United Kingdom</i>	
<i>Tony Clark, Middlesex University London, United Kingdom</i>	
<i>Balbir Barn, Middlesex University London, United Kingdom</i>	
<i>Vinay Kulkarni, Tata Consulting Services, India</i>	

When Four-Eyes Become Too Much – A Survey on the Interplay of Authorization Constraints and Workflow Resilience	1245
<i>Julius Holderer, University of Freiburg, Germany</i>	
<i>Rafael Accorsi, University of Freiburg, Germany</i>	
<i>Günter Müller, University of Freiburg, Germany</i>	
Student Research Competition Paper	
A Framework for Enterprise Agility	1249
<i>Joshua Chibuike Nwokeji, Middlesex University London, United Kingdom</i>	
Multimedia and Visualization Track	
Track Co-Chairs:	Maria da Graça C. Pimentel, Universidade de São Paulo, Brazil
	Takayuki Itoh, Ochanomizu University, Japan
	Rudinei Goularte, Universidade de São Paulo, Brazil
Track Editorial	1251
Personalized VIDEO Summarization using SIFT	1252
<i>Kaveh Darabi, Brunel University, United Kingdom</i>	
<i>Gheorghita Ghinea, Brunel University, United Kingdom</i>	
Shot-HR: A Video Shot Representation Method based on Visual Features	1257
<i>Tamires T.S. Barbieri, São Paulo University, Brazil</i>	
<i>Tiago H. Trojahn, São Paulo University, Brazil</i>	
<i>Moacir P. Ponti-Jr, São Paulo University, Brazil</i>	
<i>Rudinei Goularte, São Paulo University, Brazil</i>	
Anomalous Network Communication Detection System by Visual Pattern on a Client Computer	1263
<i>Hayate Goto, The University of Electro-Communications, Japan</i>	
<i>Tetsuji Takada, The University of Electro-Communications, Japan</i>	
Automatic Multi-Camera Remix from Single Video	1270
<i>Sujeet Mate, Nokia Technologies, Tampere, Finland</i>	
<i>Igor D.D. Curcio, Nokia Technologies, Tampere, Finland</i>	
<i>Antti Eronen, Nokia Technologies, Tampere, Finland</i>	
<i>Arto Lehtiniemi, Nokia Technologies, Tampere, Finland</i>	
Controlling the Focus and Input Events in Multimedia Applications	1278
<i>Luiz Fernando Gomes Soares, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Marcio Ferreira Moreno, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
<i>Alan Lívio Guedes Vasconcelos, Pontifical Catholic University of Rio de Janeiro, Brazil</i>	
An Approach for Controlling Synchronous Remote Instances of a Multimedia Presentation	1285
<i>Caio César Viel, Federal University of São Carlos, Brazil</i>	
<i>Erick Lazaro Melo, Federal University of São Carlos, Brazil</i>	
<i>Cesar A.C. Teixeira, Federal University of São Carlos, Brazil</i>	

Poster Papers

A Robust Video Watermarking Algorithm in H.264/AVC Compressed Domain 1291

Lotfi Abdi, University of Tunis El Manar, Tunisia

Faten Ben Abdallah, University of Sousse, Tunisia

Aref Meddeb, University of Sousse, Tunisia

Visual Detection of Singularities in Review Platforms 1294

Alessandro Colantonio, Bay31 AG, Switzerland

Roberto Di Pietro, Bell Labs, Alcatel-Lucent, France

Marinella Petrocchi, CNR IIT, Italy

Angelo Spognardi, CNR IIT, Italy

Multicore Software Engineering, Performance, Applications, and Tools Track

Track Co-Chairs: Jeremy S. Bradbury, University of Ontario of Technology, Canada

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Track Editorial 1296

Database Engines on Multicores Scale: A Practical Approach 1297

João Soares, Universidade Nova de Lisboa, Portugal

Nuno Preguiça, Universidade Nova de Lisboa, Portugal

NGrid: A Proximity Data Structure for Fluids Animation with GPU Computing 1303

Mark Joselli, Pontificia Universidade Católica do Paraná, Brazil

José Ricardo da Silva Junior, Federal Fluminense University, Brazil

Esteban Chua, Federal Fluminense University, Brazil

Boosting Locality in Multi-Version Partial Data Replication 1309

João A. Silva, Universidade Nova de Lisboa, Portugal

João M. Lourenço, Universidade Nova de Lisboa, Portugal

Hervé Paulino, Universidade Nova de Lisboa, Portugal

C and OpenCL Generation from MATLAB 1315

João Bispo, University of Porto, Portugal

Luís Reis, University of Porto, Portugal

João M.P. Cardoso, University of Porto, Portugal

A Scalable Multi-Producer Multi-Consumer Wait-Free Ring Buffer 1321

Andrew Barrington, University of Central Florida, USA

Steven Feldman, University of Central Florida, USA

Damian Dechev, University of Central Florida, USA

Compiler-Enhanced Memory Bandwidth Usage Reduction in OpenACC 1329

Ebad Salehi, University of Victoria, Canada

Ahmad Lashgar, University of Victoria, Canada

Amirali Baniasadi, University of Victoria, Canada

Poster Papers

G-KNN: An Efficient Document Classification Algorithm for Sparse Datasets on GPUs using KNN 1335

Leonardo Rocha, Federal University of São João, Brazil
Gabriel Ramos, Federal University of São João, Brazil
Rodrigo Chaves, Federal University of São João, Brazil
Rafael Sachetto, Federal University of São João, Brazil
Daniel Madeira, Federal University of São João, Brazil
Felipe Viegas, Federal University of Minas Gerais, Brazil
Guilherme Andrade, Federal University of Minas Gerais, Brazil
Sérgio Daniel, Federal University of Minas Gerais, Brazil
Marcos Gonçalves, Federal University of Minas Gerais, Brazil
Renato Ferreira, Federal University of Minas Gerais, Brazil

Parallel Trajectory Synchronization for Aircraft Conflicts Resolution 1339

Eduardo de la Iglesia, EUROCONTROL, The Netherlands
Guillermo Botella, Complutense University of Madrid, Spain
Carlos Garcia, Complutense University of Madrid, Spain
Manuel Prieto, Complutense University of Madrid, Spain

Requirements Engineering Track

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Joao Araujo, Universidade Nova de Lisboa, Portugal

Track Editorial 1342

Engineering Trust- and Reputation-Based Security Controls for Future Internet Systems 1344

Kristian Beckers, paluno, University Duisburg-Essen, Germany
Maritta Heisel, paluno, University Duisburg-Essen, Germany
Francisco Moyano, University of Malaga, Spain
Carmen Fernandez-Gago, University of Malaga, Spain

VoiceToModel: An Approach to Generate Requirements Models from Speech Recognition Mechanisms 1350

Fábio Soares, Universidade Nova de Lisboa, Portugal
João Araújo, Universidade Nova de Lisboa, Portugal
Fernando Wanderley, Universidade Nova de Lisboa, Portugal

TRL – A Traceability Representation Language 1358

Arthur Marques, Federal University of Campina Grande, Brazil
Franklin Ramalho, Federal University of Campina Grande, Brazil
Wilkerson L. Andrade, Federal University of Campina Grande, Brazil

Towards a Requirements Traceability Process Centered on the Traceability Model 1364

Arthur Marques, Federal University of Campina Grande, Brazil
Franklin Ramalho, Federal University of Campina Grande, Brazil
Wilkerson L. Andrade, Federal University of Campina Grande, Brazil

An Approach to Early Evaluation of Informational Privacy Requirements 1370

Balbir S. Barn, Middlesex University, UK
Giuseppe Primiero, Middlesex University, UK
Ravinder Barn, Royal Holloway, University of London, UK

Dynamic Decision-Making based on NFR for Managing Software Variability and Configuration Selection	1376
<i>André Almeida, Federal Institute of Education, Science and Technology, Brazil</i>	
<i>Nelly Bencomo, Aston University, United Kingdom</i>	
<i>Thais Batista, Federal University of Rio Grande do Norte, Brazil</i>	
<i>Everton Cavalcante, IRISA-UMR CNRS/Université de Bretagne-Sud, France</i>	
<i>Francisco Dantas, State University of Rio Grande do Norte, Brazil</i>	
A Multi-Criteria Approach for Assessing Cloud Deployment Options based on Non-Functional Requirements	1383
<i>Ronaldo Gonçalves Jr., University of Fortaleza, Brazil</i>	
<i>Tiago Rolim, University of Fortaleza, Brazil</i>	
<i>Américo Sampaio, University of Fortaleza, Brazil</i>	
<i>Nabor C. Mendonca, University of Fortaleza, Brazil</i>	
M-4REuse: Reusing use Cases Specifications	1390
<i>Maurício Manoel, University of Pernambuco, Brazil</i>	
<i>Maria Lencastre, University of Pernambuco, Brazil</i>	
Poster Papers	
Deriving the Behavior of Context-Sensitive Systems from Contextual Goal Models	1397
<i>Jéssyka Vilela, Federal University of Pernambuco, Brazil</i>	
<i>Jaelson Castro, Federal University of Pernambuco, Brazil</i>	
<i>João Pimentel, Federal University of Pernambuco, Brazil</i>	
<i>Monique Soares, Federal University of Pernambuco, Brazil</i>	
<i>Paulo Cavalcanti, Federal University of Pernambuco, Brazil</i>	
<i>Márcia Lucena, Universidade Federal do Rio Grande do Norte, Brazil</i>	
A Risk-Aware Framework for Compliance Goal-Obstacle Analysis	1401
<i>Bendra Ojameruaye, University of Birmingham, United Kingdom</i>	
<i>Rami Bahsoon, University of Birmingham, United Kingdom</i>	
Software Architecture: Theory, Technology, and Applications Track	
Track Co-Chairs:	Antonio Bucchiarone, Bruno Kessler Foundation of Trento, Italy
	Raffaella Mirandola, Politecnico di Milano, Israel
	Patrizia Scandurra, University of Bergamo, Italy
	Sungwon Kang, Koera Advanced Institute of Science and Technology, Korea
Track Editorial	1403
A Multi-Scale Modeling Approach for Software Architecture Deployment	1405
<i>Amal Gassara, University of Sfax, Tunisia</i>	
<i>Ismael Bouassida Rodriguez, University of Sfax, Tunisia</i>	
<i>Mohamed Jmaiel, University of Sfax, Tunisia</i>	
A Meta-Process to Construct Software Architectures for System of Systems	1411
<i>Marcelo Benites Gonçalves, University of São Paulo, Brazil</i>	
<i>Flavio Oquendo, Université de Bretagne-Sud, France</i>	
<i>Elisa Yumi Nakagawa, University of São Paulo, Brazil</i>	

OntolAD: A Formal Ontology for Architectural Descriptions	1417
<i>Milena Guessi, University of São Paulo, Brazil</i>	
<i>Dilvan A. Moreira, University of São Paulo, Brazil</i>	
<i>Gabriel Abdalla, University of São Paulo, Brazil</i>	
<i>Flavio Oquendo, University of South Brittany, France</i>	
<i>Elisa Yumi Nakagawa, University of São Paulo, Brazil</i>	
Requirements, Design and Evaluation of a Privacy Reference Architecture for Web Applications and Services	1425
<i>Tania Basso, State University of Campinas, Brazil</i>	
<i>Regina Moraes, State University of Campinas, Brazil</i>	
<i>Mario Jino, State University of Campinas, Brazil</i>	
<i>Marco Vieira, University of Coimbra, Portugal</i>	
A Systematic Literature Review on the Description of Software Architectures for Systems of Systems	1433
<i>Milena Guessi, University of São Paulo, Brazil</i>	
<i>Valdemar V.G. Neto, University of São Paulo, Brazil</i>	
<i>Thiago Bianchi, University of São Paulo, Brazil</i>	
<i>Katia R. Felizardo, University of São Paulo, Brazil</i>	
<i>Flavio Oquendo, IRISA - University of South Brittany, France</i>	
<i>Elisa Y. Nakagawa, University of São Paulo, Brazil</i>	
Architecting Cloud Tools using Software Product Line Techniques: An Exploratory Study	1441
<i>Leonardo P. Tizzei, IBM Research, Brazil</i>	
<i>Leonardo G. Azevedo, IBM Research, Brazil</i>	
<i>Maximilien de Bayser, IBM Research, Brazil</i>	
<i>Renato F.G. Cerqueira, IBM Research, Brazil</i>	
A Quantitative, Evidence-Based Approach for Recommending Software Modules	1449
<i>Thais Burity, Federal University of Paraíba, Brazil</i>	
<i>Gledson Elias, Federal University of Paraíba, Brazil</i>	
A Decision-Making Tool to Support Architectural Designs based on Quality Attributes	1457
<i>Italo Carlo Lopes Silva, Federal University of Alagoas, Brazil</i>	
<i>Patrick H.S. Brito, Federal University of Alagoas, Brazil</i>	
<i>Baldoino F. dos S. Neto, Federal University of Alagoas, Brazil</i>	
<i>Evandro Costa, Federal University of Alagoas, Brazil</i>	
<i>Andre Almeida Silva, Federal University of Alagoas, Brazil</i>	
Poster Papers	
AutoQA: Quality Attributes as a Service in Cloud	1464
<i>Ashish Agrawal, Indian Institute of Technology Kanpur, India</i>	
<i>Prabhakar T.V., Indian Institute of Technology Kanpur, India</i>	
Towards a Multi-Scale Modeling Approach for Software Architectures	1468
<i>Ilhem Khlif, University of Sfax, Tunisia</i>	
<i>Mohamed Hadj Kacem, University of Sfax, Tunisia</i>	
<i>Ahmed Hadj Kacem, University of Sfax, Tunisia</i>	
<i>Khalil Drira, LAAS-CNRS and Université de Toulouse, France</i>	

Software Engineering Track

Track Co-Chairs: Byungjeong Lee, Univesity of Seoul, Korea
Eunjee Song, Baylor University, USA

Track Editorial	1471
Exploring Decision Drivers on God Class Detection in Three Controlled Experiments	1472
<i>José Amancio M. Santos, State University of Feira de Santana, Brazil</i> <i>Manoel G. de Mendonça, Federal University of Bahia, Brazil</i>	
Incremental Aspect Weaving – An Approach to Faster AOP Learning	1480
<i>Y. Raghu Reddy, IIIT Hyderabad, India</i> <i>Anish Shankar, IIIT Hyderabad, India</i> <i>Madhavan Chethur, IIIT Hyderabad, India</i>	
DesignSpace – An Infrastructure for Multi-User/Multi-Tool Engineering	1486
<i>Andreas Demuth, Johannes Kepler University Linz, Austria</i> <i>Markus Riedl-Ehrenleitner, Johannes Kepler University Linz, Austria</i> <i>Alexander Nöhrer, Johannes Kepler University Linz, Austria</i> <i>Peter Hehenberger, Johannes Kepler University Linz, Austria</i> <i>Klaus Zeman, Johannes Kepler University Linz, Austria</i> <i>Alexander Egyed, Johannes Kepler University Linz, Austria</i>	
Pattern-Based Transformation of Sequence Diagrams using QVT	1492
<i>Dae-Kyoo Kim, Oakland University, USA</i> <i>Byunghun Lee, Oakland University, USA</i>	
A Bayesian Network Approach to Assist on the Interpretation of Software Metrics	1498
<i>Mirko Perkusich, Instituto Federal de Educação, Ciência e Tecnologia da Paraíba, Brazil</i> <i>Amaury Medeiros, Universidade Federal de Campina Grande, Brazil</i> <i>Lenardo Chaves e Silva, Universidade Federal de Campina Grande, Brazil</i> <i>Kyller Costa Gorgônio, Universidade Federal de Campina Grande, Brazil</i> <i>Hyggo Oliveira de Almeida, Universidade Federal de Campina Grande, Brazil</i> <i>Angelo Perkusich, Universidade Federal de Campina Grande, Brazil</i>	
Automated Software Winnowing	1504
<i>Gregory Malecha, Harvard University, USA</i> <i>Ashish Gehani, SRI International, USA</i> <i>Natarajan Shankar, SRI International, USA</i>	
Parallel Reachability Testing based on Hadoop MapReduce	1512
<i>XiaoFang Qi, Southeast University, China</i> <i>YueRan Li, Southeast University, China</i> <i>Mingming Zhou, Southeast University, China</i>	
A Framework to Formally Verify Conformance of a Software Process to a Software Method	1518
<i>Djamel-Eddine Khelladi, Sorbonne Université, France</i> <i>Reda Bendraou, Sorbonne Université, France</i> <i>Souheib Baarir, LRDE, EPITA, France</i> <i>Yoann Laurent, Sorbonne Université, France</i> <i>Marie-Pierre Gervais, Université Paris Ouest Nanterre La Défense/LIP6, France</i>	
SLC: A Visual Cohesion Metric to Predict the Usability of Graphical User Interfaces	1526
<i>Khalid Alemerien, North Dakota State University, USA</i> <i>Kenneth Magel, North Dakota State University, USA</i>	

Test Coverage and Impact Analysis for Detecting Refactoring Faults: A Study on the Extract Method Refactoring	1534
<i>Everton L.G. Alves, Federal University of Campina Grande, Brazil</i>	
<i>Tiago Massoni, Federal University of Campina Grande, Brazil</i>	
<i>Patricia D.L. Machado, Federal University of Campina Grande, Brazil</i>	
Acceptance Factors of Pull Requests in Open-Source Projects	1541
<i>Daricélio Moreira Soares, Federal University of Acre, Brazil</i>	
<i>Manoel Limeira de Lima Júnior, Federal University of Acre, Brazil</i>	
<i>Leonardo Murta, Fluminense Federal University, Brazil</i>	
<i>Alexandre Plastino, Fluminense Federal University, Brazil</i>	
From UML Diagrams to Simulink Models: A Precise and Verified Translation	1547
<i>Andrei Costa, Federal University of Pelotas, Brazil</i>	
<i>Simone Cavalheiro, Federal University of Pelotas, Brazil</i>	
<i>Luciana Foss, Federal University of Pelotas, Brazil</i>	
<i>Leila Ribeiro, Federal University of Rio Grande do Sul, Brazil</i>	
Predicting Severity of Bug Report by Mining Bug Repository with Concept Profile	1553
<i>Tao Zhang, The Hong Kong Polytechnic University, Hong Kong</i>	
<i>Geunseok Yang, University of Seoul, Korea</i>	
<i>Byungjeong Lee, University of Seoul, Korea</i>	
<i>Alvin T.S. Chan, The Hong Kong Polytechnic University, Hong Kong</i>	
AB=BA: Execution Equivalence as a New Type of Testing Oracle	1559
<i>A. Elyasov, Utrecht University, The Netherlands</i>	
<i>W. Prasetya, Utrecht University, The Netherlands</i>	
<i>J. Hage, Utrecht University, The Netherlands</i>	
<i>U. Rueda, Universitat Politècnica de València, Spain</i>	
<i>T. Vos, Universitat Politècnica de València, Spain</i>	
<i>N. Condori-Fernández, VU University Amsterdam, The Netherlands</i>	
Developers Assignment for Analyzing Pull Requests	1567
<i>Manoel Limeira de Lima Júnior, Federal University of Acre, Brazil</i>	
<i>Daricélio Moreira Soares, Federal University of Acre, Brazil</i>	
<i>Alexandre Plastino, Fluminense Federal University, Brazil</i>	
<i>Leonardo Murta, Fluminense Federal University, Brazil</i>	
Combining Static and Dynamic Data flow Analysis: A Hybrid Approach for Detecting Data Leaks in Java Applications	1573
<i>M. Mongiovì, Università di Catania, Italy</i>	
<i>G. Giannone, Università di Catania, Italy</i>	
<i>A. Fornai, Università di Catania, Italy</i>	
<i>G. Pappalardo, Università di Catania, Italy</i>	
<i>E. Tramontana, Università di Catania, Italy</i>	
Architectural Stability and Evolution Measurement for Software Reuse	1580
<i>Eleni Constantinou, Aristotle University of Thessaloniki, Greece</i>	
<i>Ioannis Stamelos, Aristotle University of Thessaloniki, Greece</i>	
Design Pattern Detection using FINDER	1586
<i>Haneen Dabain, York University, Canada</i>	
<i>Ayesha Manzer, York University, Canada</i>	
<i>Vassilios Tzerpos, York University, Canada</i>	

A Method to Support Search String Building in Systematic Literature Reviews through Visual Text Mining	1594
<i>Germano Duarte Mergel, Pontificia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>Milene Selbach Silveira, Pontificia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>Tiago Silva da Silva, Federal University of São Paulo, Brazil</i>	
Implementation and Evaluation of an Approach for Extracting Feature Models from Documented UML use Case Diagrams	1602
<i>Mariem Mefteh, University of Sfax, Tunisia</i>	
<i>Nadia Bouassida, University of Sfax, Tunisia</i>	
<i>Hanène Ben-Abdallah, King Abdulaziz University, Saudi Arabia</i>	
Examining the Effectiveness of using Concolic Analysis to Detect Code Clones	1610
<i>Daniel E. Krutz, Rochester Institute of Technology, USA</i>	
<i>Samuel A. Malachowsky, Rochester Institute of Technology, USA</i>	
<i>Emad Shihab, Concordia University, Canada</i>	
An Investigation on the Evolutionary Nature of Exception Handling Violations in Software Product Lines	1616
<i>Demóstenes Sena, Federal University of Rio Grande do Norte, Brazil</i>	
<i>Roberta Coelho, Federal University of Rio Grande do Norte, Brazil</i>	
<i>Uirá Kulesza, Federal University of Rio Grande do Norte, Brazil</i>	
Mapping Functional Behavior onto Architectural Model in a Model Driven Embedded System Design	1624
<i>Prachi Joshi, Virginia Polytechnic Institute and State University, USA</i>	
<i>Sandeep K. Shukla, Virginia Polytechnic Institute and State University, USA</i>	
<i>Jean Pierre Talpin, INRIA, France</i>	
<i>Huafeng Yu, Toyota ITC, USA</i>	
COSMIC Functional Measurement of Mobile Applications and Code Size Estimation	1631
<i>Loris D'Avanzo, University of Salerno, Italy</i>	
<i>Filomena Ferrucci, University of Salerno, Italy</i>	
<i>Carmine Gravino, University of Salerno, Italy</i>	
<i>Pasquale Salza, University of Salerno, Italy</i>	
Poster Papers	
A Concise Specification Language for Trace Monitoring	1637
<i>K. Vorobyov, Bond University, Australia</i>	
<i>P. Krishnan, Oracle Labs, Australia</i>	
<i>P.A. Stocks, , Australia</i>	
Dynamic Variability Support in Workflow-Based Systems: An Evaluation of the LateVa Framework	1641
<i>Aitor Murguzur, IK4-Ikerlan Research Center, Spain</i>	
<i>Salvador Trujillo, IK4-Ikerlan Research Center, Spain</i>	
<i>Goiuria Sagardui, Mondragon University, Spain</i>	
Evaluating Defect Prediction Approaches using a Massive Set of Metrics: An Empirical Study	1644
<i>Xiao Xuan, Zhejiang University, China</i>	
<i>David Lo, Singapore Management University, Singapore</i>	
<i>Xin Xia, Zhejiang University, China</i>	
<i>Yuan Tian, Singapore Management University, Singapore</i>	

A Library to Modularly Control Asynchronous Executions	1648
<i>Hiroaki Fukuda, Shibaura Institute of Technology, Japan</i>	
<i>Paul Leger, Universidad Católica del Norte, Chile</i>	
Verifying Eventuality Properties of Imprecise System Requirements using Event-B	1651
<i>Hong Anh Le, Hanoi University of Mining and Geology, Vietnam</i>	
<i>Ninh Thuan Truong, VNU - University of Engineering and Technology, Vietnam</i>	
<i>Shin Nakajima, National Institute of Informatics, Japan</i>	
Mapping the Potential Change Impact in Object-Oriented Software	1654
<i>Mívia M. Ferreira, Pontifical Catholic University of Minas Gerais, Brazil</i>	
<i>Kecia A.M. Ferreira, Federal Center for Technological Education of Minas Gerais, Brazil</i>	
<i>Humberto T. Marques-Neto, Pontifical Catholic University of Minas Gerais, Brazil</i>	
Mining Software Development Process Variations	1657
<i>Renata M.S. Santos, Federal University of Rio de Janeiro / Federal Fluminense Institute, Brazil</i>	
<i>Toacy C. Oliveira, Federal University of Rio de Janeiro, Brazil</i>	
<i>Fernando Brito e Abreu, ISCTE-IUL, Portugal</i>	
Using Developers' Feedback to Improve Code Smell Detection	1661
<i>Mario Hozano, Federal University of Campina Grande, Brazil</i>	
<i>Henrique Ferreira, Federal University of Alagoas, Brazil</i>	
<i>Italo Silva, Federal University of Alagoas, Brazil</i>	
<i>Baldoino Fonseca, Federal University of Alagoas, Brazil</i>	
<i>Evandro Costa, Federal University of Alagoas, Brazil</i>	
A Parallel Genetic Algorithms Framework based on Hadoop MapReduce	1664
<i>Filomena Ferrucci, University of Salerno, Italy</i>	
<i>Pasquale Salza, University of Salerno, Italy</i>	
<i>M-Tahar Kechadi, University College of Dublin, Ireland</i>	
<i>Federica Sarro, University College of London, UK</i>	
Student Research Competition Paper	
Reconstruction of Runtime Software Architecture for Object-Oriented Systems	1668
<i>Hwi Ahn, KAIST, Korea</i>	
Service-Oriented Architecture and Programming Track	
Track Co-Chairs:	Alberto Lluch Lafuente, IMT Lucca, Italy
	Marcello Maria Bersani, Polytechnic of Millan, Italy
	Alberto Núñez, Universidad Complutense de Madrid, Spain
Track Editorial	1670
A Hybrid Framework for WS-BPEL Scenario Execution Adaptation, using Monitoring and Feedback Data	1672
<i>Margaris Dionisis, University of Athens, Greece</i>	
<i>Vassilakis Costas, University of Peloponnese, Greece</i>	
<i>Georgiadis Panagiotis, University of Athens, Greece</i>	

A Software Process Line for Service-Oriented Applications	1680
<i>Cleiton Garcia, Pontificia Universidade Católica do Paraná, Brazil</i>	
<i>Marco Paludo, Pontificia Universidade Católica do Paraná, Brazil</i>	
<i>Andreia Malucelli, Pontificia Universidade Católica do Paraná, Brazil</i>	
<i>Sheila Reinehr, Pontificia Universidade Católica do Paraná, Brazil</i>	

Model-Checking Verification of Publish-Subscribe Architectures in Web Service Contexts	1688
<i>Gregorio Díaz, University of Castilla-La Mancha, Spain</i>	
<i>M. Emilia Cambroner, University of Castilla-La Mancha, Spain</i>	
<i>Hermenegilda Maciá, University of Castilla-La Mancha, Spain</i>	
<i>Valentín Valero, University of Castilla-La Mancha, Spain</i>	

A Data Quality-Aware Cloud Service based on Metaheuristic and Machine Learning Provisioning Algorithms	1696
<i>Dimas C. Nascimento, Federal University of Campina Grande, Brazil</i>	
<i>Carlos Eduardo Pires, Federal University of Campina Grande, Brazil</i>	
<i>Demetrio Gomes Mestre, Federal University of Campina Grande, Brazil</i>	

Formal Modeling Self-Adaptive Service-Oriented Applications	1704
<i>Elvinia Riccobene, University of Milan, Italy</i>	
<i>Patrizia Scandurra, University of Bergamo, Italy</i>	

Characterizing the Performance of Web Service Frameworks under Security Attacks	1711
<i>Rui André Oliveira, University of Coimbra, Portugal</i>	
<i>Nuno Laranjeiro, University of Coimbra, Portugal</i>	
<i>Marco Vieira, University of Coimbra, Portugal</i>	

Poster Paper

A Service-Oriented Architecture for Billing Resources in IaaS Cloud Platforms	1719
<i>Nayane Ponte, Federal University of Ceará, Brazil</i>	
<i>Fernando Trinta, Federal University of Ceará, Brazil</i>	
<i>Ricardo Viana, Federal University of Ceará, Brazil</i>	
<i>Rossana Andrade, Federal University of Ceará, Brazil</i>	
<i>Vinicius Garcia, Federal University of Pernambuco, Brazil</i>	
<i>Rodrigo Assad, USTORE, Brazil</i>	

Software Verification and Testing Track

Track Co-Chairs: Gwen Salaun, University of Grenoble Alpes, France
Marielle Stoeltinga, University of Twente, The Netherlands

Truth and Myth of Independent Software Testing – A Controlled Human Experiment	1722
<i>Ali Sunyaev, University of Cologne, Germany</i>	
<i>Dirk Basten, University of Cologne, Germany</i>	

Programs from Proofs of Predicated Dataflow Analyses	1729
<i>Marie-Christine Jakobs, University of Paderborn, Germany</i>	
<i>Heike Wehrheim, University of Paderborn, Germany</i>	

Tri-Modal Under-Approximation of Event Systems for Test Generation	1737
<i>Hadrien Bride, FEMTO-ST, France</i>	
<i>Jacques Julliand, FEMTO-ST, France</i>	
<i>Pierre-Alain Masson, FEMTO-ST, France</i>	

Polyhedra to the Rescue of Array Interpolants	1745
<i>Francesco Alberti, University of Lugano, Switzerland</i>	
<i>David Monniaux, Université de Grenoble, VERIMAG; CNRS, VERIMAG, France</i>	
Symmetry Reduced State Classes for Time Petri Nets	1751
<i>Pierre-Alain Bourdil, LAAS/CNRS and Thales Avionics, France</i>	
<i>Bernard Berthomieu, LAAS/CNRS, France</i>	
<i>Silvano Dal Zilio, LAAS/CNRS, France</i>	
<i>François Vernadat, LAAS/CNRS, and INSA Toulouse, France</i>	
Model based Testing of an Interactive Music System	1759
<i>Clément Poncelet, IRCAM, France</i>	
<i>Florent Jacquemard, INRIA, France</i>	
Fast as a Shadow, Expressive as a Tree: Hybrid Memory Monitoring for C	1765
<i>Arvid Jakobsson, CEA LIST, France</i>	
<i>Nikolai Kosmatov, CEA LIST, France</i>	
<i>Julien Signoles, CEA LIST, France</i>	
LocFaults: A new Flow-Driven and Constraint-Based Error Localization Approach	1773
<i>Mohammed Bekkouche, University of Nice-Sophia Antipolis, I3S/CNRS, France</i>	
<i>Hélène Collavizza, University of Nice-Sophia Antipolis, I3S/CNRS, France</i>	
<i>Michel Rueher, University of Nice-Sophia Antipolis, I3S/CNRS, France</i>	
Extending mCRL2 with Ready Simulation and iocos Input-Output Conformance Simulation	1781
<i>Carlos Gregorio-Rodríguez, Universidad Complutense de Madrid, Spain</i>	
<i>Luis Llana, Universidad Complutense de Madrid, Spain</i>	
<i>Rafael Martínez-Torres, Universidad Complutense de Madrid, Spain</i>	
Runtime Enforcement for Component-Based Systems	1789
<i>Hadil Charafeddine, American University of Beirut, Lebanon</i>	
<i>Khalil El-Harake, American University of Beirut, Lebanon</i>	
<i>Yliès Falcone, Université Grenoble-Alpes, France</i>	
<i>Mohamad Jaber, American University of Beirut, Lebanon</i>	
Random versus Combinatorial Effectiveness in Software Conformance Testing: A Case Study	1797
<i>Andrea Calvagna, University of Catania, Italy</i>	
<i>Andrea Fornai, University of Catania, Italy</i>	
<i>Emiliano Tramontana, University of Catania, Italy</i>	
Concurrent Streams in Markov Chain usage Models for Statistical Testing of Complex Systems	1803
<i>Daniel Homm, University of Erlangen-Nuremberg, Germany</i>	
<i>Jürgen Eckert, University of Erlangen-Nuremberg, Germany</i>	
<i>Reinhard German, University of Erlangen-Nuremberg, Germany</i>	
Constructive Extensibility of Trustworthy Component-Based Systems	1808
<i>José Dihego, Federal University of Pernambuco, Brazil</i>	
<i>Augusto Sampaio, Federal University of Pernambuco, Brazil</i>	
<i>Marcel Oliveira, Universidade Federal do Rio Grande do Norte, Brazil</i>	
Automated System-Level Safety Testing using Constraint Patterns for Automotive Operating Systems	1815
<i>Taejoon Byun, Kyungpook National University, Korea</i>	
<i>Yunja Choi, Kyungpook National University, Korea</i>	

Student Research Competition Paper

Formalising the SECD Machine with Nominal Isabelle	1823
<i>Gergely Buday, Károly Róbert College, Hungary</i>	

Coordination Models, Languages and Applications Track

Track Co-Chairs: Mirko Viroli, Università di Bologna, Italy
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Track Editorial	1825
------------------------------	------

Data-Centric Authorization and Integrity Control in a Linda Tuplespace	1827
<i>Anders Fongen, Norwegian Defence Research Establishment (FFI), Norway</i>	

A Grammatical Approach to Data-Centric Case Management in a Distributed Collaborative Environment	1834
--	------

Eric Badouel, INRIA Rennes, France
Loïc Hérouët, INRIA Rennes, France
Georges-Edouard Kouamou, ENSP and LIRIMA, France
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A Calculus for Attribute-Based Communication	1840
---	------

Yehia Abd Alrahman, IMT Institute for Advanced Studies Lucca, Italy
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Protelis: Practical Aggregate Programming	1846
--	------

Danilo Pianini, Università di Bologna, Italy
Mirko Viroli, Università di Bologna, Italy
Jacob Beal, BBN Technologies, USA

Poster Papers

A Domain Specific Language for Spatial Simulation Scenarios(DSL3S): Introduction and Tool Support	1854
--	------

Luís de Sousa, CRP Henri Tudor, Luxembourg
Alberto Rodrigues da Silva, IST / INESC-ID, Portugal

Monitoring and Visualizing Adaptation of Autonomic Systems at Runtime	1857
--	------

Dhaminda B. Abeywickrama, Fraunhofer FOKUS, Germany
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SUNNY-CP: A Sequential CP Portfolio Solver 1861

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Towards Automatic Poetry Generation using Constraint Handling Rules 1868

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On the Use and Effect of Graph Decomposition in Qualitative Spatial and Temporal Reasoning 1874

Michael Sioutis, University of Lille Nord de France, France
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BDD Construction for All Solutions SAT and Efficient Caching Mechanism 1880

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Poster Paper

Crucial Components in Probabilistic Inference Pipelines 1887

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Embedded Systems Track

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Track Editorial 1890

A Time-Composable Operating System for the Patmos Processor 1892

Marco Ziccardi, University of Padua, Italy
Martin Schoeberl, Technical University of Denmark, Denmark
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Persistence-Based Branch Misprediction Bounds for WCET Analysis 1898

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Reliability-Aware Striping with Minimized Performance Overheads for Flash-Based Storage Devices 1906

Ming-Chang Yang, National Taiwan University, Taiwan
Yu-Ming Chang, National Taiwan University, Taiwan
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Yuan-Hao Chang, Institute of Information Science, Academia Sinica, Taiwan
Lue-Jane Lee, National Taiwan University, Taiwan
Tei-Wei Kuo, National Taiwan University, Taiwan

Static Energy Reduction by Performance Linked Cache Capacity Management in Tiled CMPs 1913
Hemangee K. Kapoor, Indian Institute of Technology Guwahati, India
Shirshendu Das, Indian Institute of Technology Guwahati, India
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Dynamic Associativity Management using Utility based Way-Sharing 1919
Shirshendu Das, Indian Institute of Technology Guwahati, India
Hemangee K. Kapoor, Indian Institute of Technology Guwahati, India

A Multi-DAG Model for Real-Time Parallel Applications with Conditional Execution 1925
José Carlos Fonseca, CISTER/INESC TEC, ISEP, Portugal
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Gurulingesh Raravi, Xerox Research Center India, India
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Compilation of Synchronous Observers as Code Contracts 1933
Arnaud Dieumegard, INPT-ENSEEIH, France
Pierre-Loïc Garoche, ONERA, France
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TRES: A Modular Representation of Schedulers, Tasks, and Messages to Control Simulations in Simulink 1940
Fabio Cremona, Scuola Superiore Sant'Anna, Italy
Matteo Morelli, Scuola Superiore Sant'Anna, Italy
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Automated Generation of Robotics Applications from Simulink and SysML Models 1948
Matteo Morelli, Scuola Superiore Sant'Anna, Italy

Poster Papers

Introduction to Partial Time Composability for COTS Multicores 1955
Gabriel Fernandez, Barcelona Supercomputing Center, Spain
Jaume Abella, Barcelona Supercomputing Center, Spain
Eduardo Quiñones, Barcelona Supercomputing Center, Spain
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Marco Zulianello, European Space Agency, The Netherlands
Francisco J. Cazorla, Barcelona Supercomputing Center, Spain

Identification of Embedded Control Units by State Encoding and Power Consumption Analysis 1957
Edward Jung, Southern Polytechnic State University, USA
Cedric Marchand, University of Lyon, Saint-Etienne, France
Lilian Bossuet, University of Lyon, Saint-Etienne, France

Student Research Competition Paper

A Holistic Optimization Approach for the Synthesis of AUTOSAR E/E Architecture 1960
Fouad Khenfri, ESTACA, France

Object Oriented Programming Languages and Systems Track

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The Omission Finder for Debugging What-Should-Have-Happened Bugs in Object-Oriented Programs 1962

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Hidehiko Masuhara, Tokyo Institute of Technology, Japan

Adaptive Just-in-Time Value Class Optimization: Transparent Data Structure Inlining for Fast Execution 1970

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Carl Friedrich Bolz, King's College London, UK

Robert Hirschfeld, University of Potsdam, Germany

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Composable and Hygienic Typed Syntax Macros 1986

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Chenglong Wang, Carnegie Mellon University, USA

Jonathan Aldrich, Carnegie Mellon University, USA

The Safety of Dynamic Mixin Composition 1992

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Emil Sekerinski, McMaster University, Canada

Operating Systems Track

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Track Editorial 2000

M-CLOCK: Migration-Optimized Page Replacement Algorithm for Hybrid DRAM and PCM Memory Architecture 2001

Minho Lee, Sungkyunkwan University, Korea

Dong Hyun Kang, Sungkyunkwan University, Korea

Junghoon Kim, Sungkyunkwan University, Korea

Young Ik Eom, Sungkyunkwan University, Korea

Improving Random Write Performance in Heterogeneous Erasure-Coded Drive Arrays by Offloading Code Block Requests 2007

Nikolaus Jeremic, University of Rostock, Germany

Helge Parzyjegl, University of Rostock, Germany

Gero Mühl, University of Rostock, Germany

Towards Fast Profiling of Storage Devices Regarding Access Sequentiality 2015

Francieli Zanon Boito, Federal University of Rio Grande do Sul, Brazil

Rodrigo Virote Kassick, Federal University of Rio Grande do Sul, Brazil

Philippe O.A. Navaux, Federal University of Rio Grande do Sul, Brazil

Yves Denneulin, University of Grenoble, France

Exposing Non-Volatile Memory Cache for Adaptive Storage Access	2021
<i>Shuichi Oikawa, University of Tsukuba, Japan</i>	
ACFS: A Completely Fair Scheduler for Asymmetric Single-ISA Multicore Systems	2027
<i>Juan Carlos Saez, Complutense University of Madrid, Spain</i>	
<i>Adrian Pousa, National University of La Plata, Argentina</i>	
<i>Fernando Castro, Complutense University of Madrid, Spain</i>	
<i>Daniel Chaver, Complutense University of Madrid, Spain</i>	
<i>Manuel Prieto-Matias, Complutense University of Madrid, Spain</i>	
Partial Coscheduling of Virtual Machines based on Memory Access Patterns	2033
<i>Anselm Busse, Technische Universität Berlin, Germany</i>	
<i>Jan H. Schönherr, Technische Universität Berlin, Germany</i>	
<i>Matthias Diener, Federal University of Rio Grande do Sul, Brazil</i>	
<i>Phillipe O.A. Navaux, Federal University of Rio Grande do Sul, Brazil</i>	
<i>Hans-Ulrich Heiß, Technische Universität Berlin, Germany</i>	
Dual Region Write Buffering: Making Large-Scale Nonvolatile Buffer using Small Capacitor in SSD ...	2039
<i>Dongwook Kim, Hanyang University, Korea</i>	
<i>Sooyong Kang, Hanyang University, Korea</i>	
SSD Caching to Overcome Small Write Problem of Disk-Based RAID in Enterprise Environments	2047
<i>Eunjae Lee, University of Seoul, Korea</i>	
<i>Yongseok Oh, University of Seoul, Korea</i>	
<i>Donghee Lee, University of Seoul, Korea</i>	
An Experimental Comparison Analysis of Kernel-Level Memory Allocators	2054
<i>Tais B. Ferreira, Federal University of Uberlandia, Brazil</i>	
<i>Rivalino Matias, Federal University of Uberlandia, Brazil</i>	
<i>Autran Macedo, Federal University of Uberlandia, Brazil</i>	
<i>Bruno Evangelista, Federal University of Uberlandia, Brazil</i>	
On Running Data-Intensive Algorithms with Intelligent SSD and Host CPU: A Collaborative Approach	2060
<i>Yong-Yeon Jo, Hanyang University, Korea</i>	
<i>SungWoo Cho, Hanyang University, Korea</i>	
<i>Sang-Wook Kim, Hanyang University, Korea</i>	
<i>Duck-Ho Bae, Hanyang University, Korea</i>	
<i>Hyunok Oh, Hanyang University, Korea</i>	
Poster Papers	
Performance Impact of Operating Systems' Caching Parameters on Parallel File Systems	2066
<i>Eduardo C. Inacio, Federal University of Santa Catarina, Brazil</i>	
<i>Mario A.R. Dantas, Federal University of Santa Catarina, Brazil</i>	
<i>Francieli Z. Boito, Federal University of Rio Grande do Sul, Brazil</i>	
<i>Phillipe O.A. Navaux, Federal University of Rio Grande do Sul, Brazil</i>	
<i>Douglas D.J. de Macedo, Federal University of Sergipe, Brazil</i>	
Performance Implications of Cache Flushes for Non-Volatile Memory File Systems	2069
<i>Kyungjun Lee, Sungkyunkwan University, Korea</i>	
<i>Sungtae Ryu, Sungkyunkwan University, Korea</i>	
<i>Hwansoo Han, Sungkyunkwan University, Korea</i>	

An Efficient Backup-Recovery Technique to Process Large Data in Distributed Key-Value Store 2072

Donghee Min, Soongsil University, Korea

Taegye Hwang, Soongsil University, Korea

Joonhyouk Jang, Seoul National University, Korea

Yookun Cho, Seoul National University, Korea

Jiman Hong, Soongsil University, Korea

Search Space Reduction for Electric Vehicle-Based Tour Schedules 2075

Junghoon Lee, Jeju National University, Korea

Gyung-Leen Park, Jeju National University, Korea

Programming Languages Track

Track Co-Chairs: Marjan Mernik, University of Maribor, Slovenia

Barrett Bryant, University of North Texas, USA

Track Editorial 2077

Thunk Recycling for Lazy Functional Languages: Operational Semantics and Correctness 2079

Yasunao Takano, The University of Electro-Communications, Japan

Hideya Iwasaki, The University of Electro-Communications, Japan

A Modelling Language for the Effective Design of Java Annotations 2087

Irene Córdoba, Technical University of Madrid, Spain

Juan de Lara, Autonomous University of Madrid, Spain

Composable Memory Transactions with Eager Version Management 2093

Rodrigo Medeiros Duarte, Federal University of Pelotas, Brazil

André Rauber Du Bois, Federal University of Pelotas, Brazil

Maurício Lima Pilla, Federal University of Pelotas, Brazil

Gerson Geraldo H. Cavalheiro, Federal University of Pelotas, Brazil

Nested Atomic Sections with Thread Escape: Compilation 2099

Frédéric Dabrowski, University of Orléans, France

Frédéric Loulergue, Paris Diderot University, University of Orléans, France

Thomas Pinsard, University of Orléans, France

Runtime Checking C Programs 2107

Reed Milewicz, University of Alabama at Birmingham, USA

Rajesh Vanka, Matlab, USA

James Tuck, North Carolina State University, USA

Daniel Quinlan, Lawrence Livermore National Laboratory, USA

Peter Pirkelbauer, University of Alabama at Birmingham, USA

Poster Papers

Bootstrapping DSLs from User Interfaces 2115

Michaela Bačíková, Technical University of Košice, Slovakia

Jaroslav Porubán, Technical University of Košice, Slovakia

Sergej Chodarev, Technical University of Košice, Slovakia

Milan Nosál, Technical University of Košice, Slovakia

Meta-Programming with Well-Typed Code Analysis 2119

Michael Lopez, Texas A&M University, USA

Gabriel Dos Reis, Microsoft and Texas A&M University, USA

Declaratively Solving Tricky Google Code Jam Problems with Prolog-Based ECLiPSe CLP System 2122

Sergii Dymchenko, Independent Researcher, USA
Mariia Mykhailova, Independent Researcher, USA

Computer Security Track

Track Co-Chairs: Giampaolo Bella, Università di Catania, Italy
Sergio Maffei, Imperial College, UK

Track Editorial 2125

Design, Implementation and Evaluation of a Novel Anti-Virus Parasitic Malware 2127

Byungho Min, Macquarie University, Australia
Vijay Varadharajan, Macquarie University, Australia

Oblivious Outsourcing of Garbled Circuit Generation 2134

Florian Kerschbaum, SAP, Germany

Amusa: Middleware for Efficient Access Control Management of Multi-Tenant SaaS Applications 2141

Maarten Decat, Katholieke Universiteit Leuven, Belgium
Jasper Bogaerts, Katholieke Universiteit Leuven, Belgium
Bert Lagaisse, Katholieke Universiteit Leuven, Belgium
Wouter Joosen, Katholieke Universiteit Leuven, Belgium

LogSec: Adaptive Protection for the Wild Wild Web 2149

Bastian Braun, University of Passau, Germany
Korbinian Pauli, University of Passau, Germany
Joachim Posegga, University of Passau, Germany
Martin Johns, SAP Research, Germany

CryptoPaper: Digital Information Security for Physical Documents 2157

Pengcheng Wang, University of Massachusetts Amherst, USA
Xue Yu, University of Massachusetts Amherst, USA
Shuai Chen, University of Massachusetts Amherst, USA
Padmaja Duggisetty, University of Massachusetts Amherst, USA
Shuo Guo, University of Massachusetts Amherst, USA
Tilman Wolf, University of Massachusetts Amherst, USA

Tuple-based Access Control: A Provenance-based Information Flow Control for Relational Data 2165

Romuald Thion, Université Claude Bernard Lyon 1, France
François Lesueur, INSA-Lyon, France
Meriam Talbi, INSA-Lyon, France

SecSess: Keeping Your Session Tucked Away in Your Browser 2171

Philippe De Ryck, Katholieke Universiteit Leuven, Belgium
Lieven Desmet, Katholieke Universiteit Leuven, Belgium
Frank Piessens, Katholieke Universiteit Leuven, Belgium
Wouter Joosen, Katholieke Universiteit Leuven, Belgium

Automated Analysis of RBAC Policies with Temporal Constraints and Static Role Hierarchies 2177

Silvio Ranise, Fondazione Bruno Kessler, IRS Trento, Italia
Anh Truong, Fondazione Bruno Kessler, IRS Trento, University of Trento, Italia
Luca Viganò, King's College London, United Kingdom

SmartAuth: Dynamic Context Fingerprinting for Continuous User Authentication	2185
<i>Davy Preuveneers, Katholieke Universiteit Leuven, Belgium</i>	
<i>Wouter Joosen, Katholieke Universiteit Leuven, Belgium</i>	
Cost-Efficient and Attack-Resilient Approaches for State Estimation in Power Grids	2192
<i>Kaiqi Xiong, Rochester Institute of Technology, USA</i>	
<i>Peng Ning, North Carolina State University, USA</i>	
Smart Grid and Smart Technologies Track	
Track Co-Chairs:	Gail-Joon Ahn, Arizona State University, USA
	Dongwan Shin, New Mexico Tech, USA
	Seong-Je Cho, Dankook University, Korea
Profiling Energy Profilers	2198
<i>Erik Jagroep, Utrecht University, The Netherlands</i>	
<i>Jan Martijn E.M. van der Werf, Utrecht University, The Netherlands</i>	
<i>Slinger Jansen, Utrecht University, The Netherlands</i>	
<i>Miguel Ferreira, Software Improvement Group, The Netherlands</i>	
<i>Joost Visser, Software Improvement Group, The Netherlands</i>	
Harnessing the Unknown in Advanced Metering Infrastructure Traffic	2204
<i>Valentin Tudor, Chalmers University of Technology, Sweden</i>	
<i>Magnus Almgren, Chalmers University of Technology, Sweden</i>	
<i>Marina Papatriantafilou, Chalmers University of Technology, Sweden</i>	
SMARTflow: A Solution for Autonomic Management and Control of Communication Networks for Smart Grids	2212
<i>Yona Lopes, Fluminense Federal University, Brazil</i>	
<i>Natalia C. Fernandes, Fluminense Federal University, Brazil</i>	
<i>Carlos A.M. Bastos, Fluminense Federal University, Brazil</i>	
<i>Débora C. Muchaluat-Saade, Fluminense Federal University, Brazil</i>	
Defending Against Load Monitoring in Smart Metering Data through Noise Addition	2218
<i>Pedro Barbosa, Federal University of Campina Grande, Brazil</i>	
<i>Andrey Brito, Federal University of Campina Grande, Brazil</i>	
<i>Hyggo Almeida, Federal University of Campina Grande, Brazil</i>	
Solar Irradiance Forecasting using Multi-Layer Cloud Tracking and Numerical Weather Prediction ...	2225
<i>Jin Xu, Stony Brook University, USA</i>	
<i>Shinjae Yoo, Brookhaven National Lab, USA</i>	
<i>Dantong Yu, Brookhaven National Lab, USA</i>	
<i>Dong Huang, Brookhaven National Lab, USA</i>	
<i>John Heiser, Brookhaven National Lab, USA</i>	
<i>Paul Kalb, Brookhaven National Lab, USA</i>	
By-Design Vulnerabilities in the ANSI C12.22 Protocol Specification	2231
<i>Julian L. Rrushi, British Columbia Institute of Technology, Canada</i>	
<i>Hassan Farhangi, British Columbia Institute of Technology, Canada</i>	
<i>Radina Nikolic, British Columbia Institute of Technology, Canada</i>	
<i>Clay Howey, British Columbia Institute of Technology, Canada</i>	
<i>Kelly Carmichael, British Columbia Institute of Technology, Canada</i>	
<i>Ali Palizban, British Columbia Institute of Technology, Canada</i>	

Software Platforms Track

Track Co-Chairs: Jinman Jung, Seoul National University, Korea
Jun Huang, Chongqing University of Post & Telecommunications, China

Track Editorial 2237

A Scalable Platform for Mobile Social Gaming 2239

Federico Bergenti, Università degli Studi di Parma, Italy
Giovanni Caire, Telecom Italia S.p.A., Italy
Danilo Gotta, Telecom Italia S.p.A., Italy

The Deployment of Shared Data Objects Among Handheld and Wearable Devices 2245

Sheng-Wei Cheng, National Taiwan University, Academia Sinica, Taiwan
Che-Wei Chang, Chang Gung University, Taiwan
Yuan-Hao Chang, Academia Sinica, Taiwan
Pi-Cheng Hsiu, Academia Sinica, Taiwan
Chia-Heng Tu, Smart Network System Institute, Institute for Information Industry, Taiwan

Study of Wireless Mammography Image Transmission Impacts on Robust Cyber-Aided Diagnosis Systems 2252

Samaneh Aminikhanghahi, South Dakota State University, USA
Sung Shin, South Dakota State University, USA
Wei Wang, San Diego State University, USA
Soon I. Jeon, Electronics and Telecommunications Research Institute, Korea
Seong H. Son, Electronics and Telecommunications Research Institute, Korea
Chulwoo Park, South Dakota State University, USA

Performance Analysis for a Service Delivery Platform in Software Defined Network 2257

Qiang Duan, The Pennsylvania State University, USA
Mengxi Zeng, Chongqing University of Posts and Telecommunications, China
Jun Huang, Chongqing University of Posts and Telecommunications, China
Cong-cong Xing, Nicholls State University, USA

GISch: A Novel Scheduler for a Heterogeneous Telescope Network 2263

M.C. López-Casado, Universidad de Malaga, Spain
C.J. Pérez del Pulgar, Universidad de Malaga, Spain
J. Cabello-Castillo, Universidad de Malaga, Spain
V.F. Muñoz, Universidad de Malaga, Spain
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J. Maza, Universidad de Chile, Chile
S. Karpov, Russian Academy of Science, Russia
F.M. Sánchez, Universidad Politecnica de Madrid, Spain

Adaptive Blurring of Sensor Data for Balancing Privacy and Utility for Ubiquitous Services 2271

Assaad Moawad, University of Luxembourg, Luxembourg
Thomas Hartmann, University of Luxembourg, Luxembourg
François Fouquet, University of Luxembourg, Luxembourg
Jacques Klein, University of Luxembourg, Luxembourg
Yves Le Traon, University of Luxembourg, Luxembourg

Fairness-Oriented Resource Optimization for WRAN Self-Coexistence	2279
<i>MD Nashid Anjum, South Dakota School of Mines and Technology, USA</i>	
<i>Yanxiao Zhao, South Dakota School of Mines and Technology, USA</i>	
<i>Yu Luo, University of Connecticut, USA</i>	
<i>Lina Pu, University of Connecticut, USA</i>	

Poster Papers

Application-Level Task Execution Issues in Mobile Cloud Computing	2285
<i>Abida Shahzad, Soongsil University, Korea</i>	
<i>Hyunho Ji, Soongsil University, Korea</i>	
<i>Pankoo Kim, Chosun University, Korea</i>	
<i>Hanil Kim, Jeju National University, Korea</i>	
<i>Byeongkyu Ko, Chosun University, Korea</i>	
<i>Jiman Hong, Soongsil University, Korea</i>	

The Implications of Disk-Based RAID and Virtualization for Write-Intensive Services	2288
<i>Pekka Pääkkönen, VTT Technical Research Centre of Finland, Finland</i>	
<i>Daniel Pakkala, VTT Technical Research Centre of Finland, Finland</i>	

Trust, Reputation, Evidence and Other Collaboration Know-How Track

Track Co-Chairs: Jean-Marc Seigneur, University of Geneva, Switzerland

An Algorithm for Distributed Certificate Chain Discovery in Open Environments	2292
<i>Samane Abdi, University College Cork, Ireland</i>	
<i>John Herbert, University College Cork, Ireland</i>	

A Security Configuration Assessment for Android Devices	2299
<i>Daniel Vecchiato, University of Campinas, Brazil</i>	
<i>Marco Vieira, University of Coimbra, Portugal</i>	
<i>Eliane Martins, University of Campinas, Brazil</i>	

Bi-Directional Trust Index Computation in Resource Marketplace	2305
<i>Avinash Sharma, Xerox Research Centre India, India</i>	
<i>Tridib Mukherjee, Xerox Research Centre India, India</i>	
<i>Partha Dutta, Xerox Research Centre India, India</i>	
<i>Vinay Hegde, International Institute of Information Technology Bangalore, India</i>	

Trust-Based Collection of Information in Distributed Reputation Networks	2312
<i>Dimitra Gkorou, Delft University of Technology, The Netherlands</i>	
<i>Johan Pouwelse, Delft University of Technology, The Netherlands</i>	
<i>Dick Epema, Delft University of Technology, The Netherlands</i>	

A Reputation System Supporting Unlinkable, Yet Authorized Expert Ratings	2320
<i>Andreas Kokoschka, University of Paderborn, Germany</i>	
<i>Ronald Petrlc, Saarland University, Germany</i>	
<i>Christoph Sorge, Saarland University, Germany</i>	

Poster Paper

A Modeling Approach for Credit Card Fraud Detection in Electronic Payment Services	2328
<i>Gabriel Preti Santiago, Universo Online Inc., Brazil</i>	
<i>Adriano C.M. Pereira, Federal University of Minas Gerais, Brazil</i>	
<i>Roberto Hirata Jr., University of São Paulo, Brazil</i>	

Keyword Index

Scroll to the keyword and select a [Blue](#) link to open a paper. After viewing the paper, use the bookmarks to the left to return to the beginning of the Keyword Index.

3

3D Face Recognition	66
3DLBP	66

A

Abstract Interpretation	1745
Abstraction	1737
Accelerators	1329
Access Control	2141, 2157, 2165
Accessibility	1350
Accessibility Evaluation	157
Activity Recognition	563
Adaptability	471
Adaptation	1397
Adaptive	981
Administrative Access Control	2177
Adversarial Search	208
Adversary Modeling	277
Agent-based Model	1123
Agent-Ensembles	1039
Aggregate Processing	1000
Aggregate Programming	1846
AHP	1383
Air Traffic Control	1339
Alchemist	1846
Algorithm	247, 673, 857, 1880
Algorithm Portfolios	1861
Algorithms	1315, 2054
ALL-SAT	1880
Alternating Decision Trees	871
Alternating Model Trees	871
Ambient Assisted Living	563
AmI Command Recognition	2204
Ami Monitor	2204
AMI Protocols	2204
Ami Traffic Features	2204
Analysis	208
Android	596
Android Security	2299
Annotation	1072

Annotations	2087
Anomaly Detection	201, 548, 701, 1263, 1294
Anonymity	2320
ANSI C12.22	2231
Ant Colony Optimization	353, 701
Anti-Virus	2127
App Classification	585
App Discovery	585
Application Security Metrics	791
Applications of Geo-Referenced Social Media	1167
Approximation Algorithm	2245
ArchiMate	1211
Architecting	1411
Architectural Analysis	1383
Architectural Decision	1457
Architectural Metrics	1449
Architectural Patterns	471
Architectural Variability	1441
Architecture Description	1417, 1433
Architecture Driven Modernization	810
Architecture Evolution	1580
Architecture Stability	1580
ARM	515
Arrays	1745
Artificial Intelligence - Learning	474
Artificial Life	335
ASIFT	542
Aspect	1480
Aspect-Oriented Programming	1648
Assessment Tool	254
Association Rules	1541
Associativity Management	1919
Astronomy	2263
Asymmetric Media	988
Asymmetric Multicore	2027
Asynchronous Programming	1648
At-Most-Once	456
Atomic Sections	2099
Attack Surface	1504
Attack-Resilient	2192
Attribute Grammars	1834
Attribute-based Communication	1840
Attributed Graph	915
Augmented Execution	2285
Authentication	2185
Authoring Tool	261
Authorization Control	1827
Automated Code-Generation	1948

Automated Evaluation	175
Automated Oracles	1559
Automated Safety Analysis	2177
Automatic	1270
Automatic Assessment	220
Automatic Document Classification	1335
Automatic Learning	360
Automotive Software	1815
Autonomic Systems	1857
Autoregressive Inte- Grated Moving Average	701
Auxiliary Information	901

B

B+-Trees	973
Background Modeling	86
Backup-Recovery	2072
Bayesian Network	47, 1370
Bayesian Networks	436, 1498
Behavior	320, 1397
Behavioral Correlation	589
Behavioral Game Theory	277
Behavioural Specification	1808
Benchmark	143, 208
Benchmark Evaluation	382
Bi-Directional Trust	2305
Big Data	201, 416, 665
Bigraphs	1405
Binary Data	901
Binary Decision Diagram	1880
Binary Matrix	1294
Bing	732
Biometric	59
Blind Users	157, 1184
Bond Measure	851
Border Surveillance	621
Bounded Knapsack	2279
Bpel Adaptation	1672
Brain Class	1472
Branch Prediction	1898
Branching Semantics	1781
Brazilian Penal Law	376
BRS	1405
Bug Report	1553
Bulk-Synchronous Parallel	501
Business Artifacts	1834
Business Models	1211
Business Process Analysis	1195
Business Process Compliance	1203

Business Process Intelligence	1225
Business Process Management - Bpm	1680
Business Process Mining	1238
Business Process Monitoring	1203

C

Cache	1309
Cache Flushing Mechanism	2069
Cache Memory	1919
Caching Framework	761
Case Management	1834
Case-based Planning	505
Case-based Reasoning	505
Cassandra	2288
CCN	695
Certificate	2292
Certificate Chain Discovery	2292
Change Drivers	1242
Change Management	1242
Change Propagation	1486, 1654
Channel Allocation	673
Channel Assignment	716
Chip Multiprocessor	1913
Chordal Graph	1874
Classification	59, 233, 825, 2252
Classification Model	1238
Classifier Chains	885
Clickjacking	791
Clinical Data	40
Cloud	442, 627
Cloud Computing	509, 615, 769, 1441, 1464, 1696, 1719, 2134, 2285
Cloud Databases	967
Cloud Deployment	1383
Cloud Segmentation	2225
Cloud Services	602
Clustering	32, 716
Clusters	464
CMP	1919
Coauthorship Network Analysis	1142
Code Clones	1610
Code Generation	2087
Code Size Estimation	1631
Code Smell	1472
Code Smell Detection	1661
Code Smells	175
Collaborative Coding	149
Collaborative Editing	509
Collaborative Filtering	264, 1060, 1148, 1672

Collaborative Processing	2060
Collaborative Virtual Environment	480
Collection of Information	2312
Collective Intelligence	133
Combinatorial Testing	1797
Communication Paradigms	1840
Community Detection	1160
Community Structure Analysis in Social Networks	1142
Community Well-Being	1167
Community-Driven Platforms	747
Competitive Neural Network	195
Compilation	2099
Complex Event Processing	1203
Complex Networks	1654
Component Inheritance	1808
Component-based Architecture	2271
Component-based System	1789
Compositionality	653
Compressed Domain	1291
Compression	396, 1329, 1880
Computational Creativity	1868
Computational Field	1846
Computational Linguistics	1868
Computer Music Domain Specific Languages	1759
Concept Drift	935
Concept Profile	1553
Conceptual Model	360
Concolic Analysis	1610
Concurrency	1648
Concurrency Control	1309
Concurrent Programming	1512, 2093
Concurrent Streams of Use	1803
Confidentiality	2157
Conformance	1231
Congestion Control	609
Consensus	468
Consistency Checking	1486
Consistency Preservation	509
Constraint	851
Constraint Handling Rules	1868
Constraint Optimization Problems	1861
Constraint Programming	1861, 2122
Constraint Satisfaction	1225
Constraint Satisfaction Problems	1861
Constraints	1773
Constraints Verification	1518
Content Analysis and Indexing	1086
Content Delivery Networks	602

Content Management System	810
Content Model	261
Content Placement	602
Context	2185
Context Awareness	1641
Context Modeling	535
Context Simulation	535
Context-Aware	596
Context-Awareness	535, 555, 1039
Context-Sensitive Systems	1397
Contextual Goal Model	1397
Continuous Cleaning	494
Continuous Time Bayesian Networks	436
Continuous Variables	436
Continuous-Valued Data	893
Contract Composition	1219
Control	320
Controlled Experiment	1472
Controlled Human Experiment	1722
Cookies	2171
Cooperation	335, 494
Cooperative Computing	501
Cooperative Systems and Applications	488
Coordination	331, 494, 1846
Cop-Kmeans	831
Correctness	1405, 1992
Correctness by Construction	1808
Correlation	851
Correlation Clustering	1117
Correlation Measurements	80
Coscheduling	2033
Co-Simulation	1940
COSMIC	1631
Cost-Efficient	2192
Co-Training	865
COTS Multicores	1955
Coverage	1534
Covert Channel	1827
CPU Cache Management	2069
Craig Interpolation	1745
Cross-Site Request Forgery, Session Hijacking, Sidejacking, Session Fixation	2149
CSP	1808
CUDA	1303, 1339
Cyber-Physical Systems	471

D

Daikon	1559
Data Analysis	416
Data Clustering	831
Data Communications	40
Data Dimensionality	3
Data Flow Analysis	1573
Data Fusion	201
Data Integration	40, 189, 967
Data Leak	1573
Data Mining	819, 915, 919, 1541
Data Mining Applications	1335
Data Processing	2252
Data Quality	1696
Data Retention	1906
Data Security	1573
Data Set	1031
Data Stream Classification	941
Data Stream Clustering	935
Data Stream Mining	935
Data Streams	954
Data Structure	1303
Data Structure Optimization	1970
Data Structures and Algorithms	220
Data Warehouse	1000
Database	988, 1297
Databases	40
Dataflow Analysis	1729
Data-Flow Patterns	54
Datastreams	960
Debloating	1504
Debugging	1962
Debugging Aids	1773
Decentralized Reputation Systems	2312
Deceptive Reviews	1294
Decision Making Process	1123
Decision Systems	2263
Decision Trees	110
Declarative Languages	1278
Declarative Programming	2122
Deep Learning	954
Defect Prediction	1644
Delegation	1245, 2292
Demo	1195
Dependable Systems	436
Dependencies	865
Deployment Architecture	1405
Design	149

Design and Implementation	416
Design Pattern	1492
Design Pattern Detection	1586
Design Process	182
Destination Grouping	2075
Developer Experience	149
Developer'S Feedback	1661
Dialogue	360
Differential Expression	3
Differential Write	2039
Digital Signature of Network Segment using Flow Analysis	701
Digital Video	1257
Dimensionality Reduction	289
Directed Acyclic Graph	80
Disambiguation Concepts	402
Discovery	1231
Discrimination-Aware Data Mining	845
Disease-Specific	47
Distributed Algorithms	301
Distributed Classification	837
Distributed Computing	448, 555
Distributed Control	331
Distributed Development	1486
Distributed Hash Tables	646
Distributed Processing	416
Distributed Software Development	1567
Distributed System	806, 2072
Distributed Systems	456, 1309, 2066
Division of Labor	494
Document Clustering	922
Document Product Line	261
Domain Engineering	2115
Domain Models	2115
Domain Specific Language	1854
Domain-Specific Languages	2087, 2115
Dom-based Testing	775
Driving	505
DSL	596
Duplicate Detection	761
Dynamic Analysis	2107
Dynamic Inference	1559
Dynamic Reinsurance Contract Optimization	125
Dynamic Scheduling	448
Dynamic Software Architecture	1464
Dynamics and Evolution of Social Networks	1142

E

EA	1189
E-Assessment	220
Eclipse Plug-In	1857
E-Commerce	2328
Educational Data Mining	247
Educational Game	214
Efficiency	448
Ego Network	960
E-Learning	214
E-Learning	261
Electric Vehicle	2075
Embedded Control Unit	1957
Embedded Systems	1547, 1940
Embedded Virtualization	515
Empirical Distributions	893
Empirical Evaluation	1358, 1364
Empirical Study	1472, 1616, 1631
Encryption	2134
Endodontic Simulator	267
Energy Consumption	2198
Energy Efficiency	589
Energy Profilers	2198
Ensemble Learning	941
Ensembles	885
Enterprise Agility	1242
Enterprise Architecture	1242
Enterprise Engineering	1195, 1211
Entity	1093
Entity Linking	1066
Entity Matching	981
Enumerative Structure	423
EPP	1339
Erasure Coding	2007
Error Correlation Coefficient	865
Error Propagation	885
Error-Localization	1773
Estimation	307
ETL Dataflow	1015
Eucalyptus	2288
Evaluation	753, 1602
Evaluation Metric	1644
Evaluation Tools	1526
Event based System	592
Event Mapping	1225
Event Systems	1737
Eventuality	1651
Evolutionary Algorithms	102, 110, 133

Evolutionary Game Theory	1154
Evolutionary Nature of Systems	1616
Exactly-Once	456
Exception Handling	1616
Executable Specification	1765
Execution Tree	1015
Experimental Evaluation	468, 609
Experimental Study	2054
Expertise	747
Explicit Control	1978
Exploratory Study	1534
Extensibility	1986
External Software Testing Centers	1722

F

Fail-Operational Requirements	471
Failure, Faults	436
Fairness in Learning	845
Fake Ratings	901
Fault Detection	1637
Fault Tolerance	448
Feasibility	627
Feature Design	1053
Feature Detection	80
Feature Extraction	825, 2252
Feature Model	1602
Feature Modeling	1441
Feature Selection	86, 1053
Features Extraction	59
Feedback Management	669
Field Calculus	1846
Field Experiments	708
File Systems	2021
Filtering	1066
Fine-Grained Static Analysis	1586
Fingerprinting	2185
Finite State Machines	1957
Flash Crowd	769
Flash Memory	1906
Flexible Robot Systems	327
Flow-based Programming	798
Fluid Animation	1303
Focus and Input Events Control	1278
Folkonomy	409
Folksonomies	360
Foreground Detection	86
Forgetting Methods	947
Formal Methods	1840

Formal Modeling	1704, 1797
Formal Ontology	1417
Formal Semantics	2099
Formal Verification	1933
Forum Analytics	254
Forums	254
Fractal Clustering	589
Frama-C	1765
Frame Scores	1252
Framebusting	791
Framework	1000
Fraud Detection	2328
Frequent Pattern Mining	857
Frequent Patterns	919
Freshness	1093
Full Duplex Wireless	634
Fully-Flexible Receptor Models	54
Functional Requirements	783
Functional Size Measurement	1631
Fuzzy Description Logics	345
Fuzzy Logic	480
Fuzzy Set	1651

G

Game Theory	277
Gamification	214, 233
Gaming the System	214
Garbled Circuits	2134
Gene Co-Expression Network	10
Gene Enrichment Analysis	32
Gene Expression Data Integration	3
Gene Interaction	47
Generalised Coarsest Partition Problem (Gcpp)	1781
Genetic Algorithm	47, 353
Genetic Algorithms	118
Genome Data Analysis	18
Gesture Recognition	143
Glaucoma	26
Global Software Development	1449
Goal Analysis	1401
Goal Orientation	227
Goal-Oriented Requirements	283
Goal-Oriented Requirements Engineering	1401
God Class	1472
Gpgpu	1303
GPS Coordinates	542
GPU	96, 1335, 1339
Gpu Computing	1303

Gradient Descent	1099
Graph Algorithms	783
Graph Analysis	1129
Graph Database	806, 1219
Graph Grammars	1547
Graph Modelling	2305
Graphic Cluster	480
Graphical User Interfaces (Gui)	2115
Green Data Centers	615
Group Recommendation	1148
Group Signatures	2320
GUI	1526

H

H264/AVC	1291
Hadoop	973, 1664
Hadoop MapReduce	1512
Hand Geometry	59
Handheld Device	2245
HAOG	66
Haptics	267
Hard Disk Drive	2015
Hardware Identification	1957
Haskell	2079, 2093
Hbase	973
HCI	143
Health Monitoring	40
Health Recommendation	527
Healthcare	521
Heat Stroke	521
Hep-2 cells	825
Heterogeneous	2060
Heterogeneous Networks	602
Heterogeneous Storage	2007
Heterogeneous Wireless Networks	680
Heuristic-based Tour Schedule	2075
Hierarchical Classification	837
Hierarchical Clustering	761
High Performance Computing	125
Homomorphic Encryption	1000
Horizon Tracking	80
Horn-Rules	396
HTML5	1285
HTTP	609
Human Factors	267, 474
Human Thermal Model	521
Human-Agent Cooperation	474
Human-in-The-Loop	301

Hybrid Memory Architecture	2001
Hybrid Storage	2007
Hygiene	1986
Hypercall Coalescing	515
Hyper-Heuristics	110

I

I*	283
I/O Performance	2015
ICT Project Analysis	1238
ID-based	169
Identity Management	1827
IDS for AMI	2204
IEC 61850	2212
IEEE 802.11	634
ILS	1117
Image Analysis	92
Image Processing	26, 825, 2157
Image Representation	74, 92
Image Retrieval	74
Immediate Feedback	220
Immunofluorescence Pattern	825
Impact Analysis	1534
Impairments	662
Incremental	963
Incremental Compilation	1480
Independent Software Testing	1722
Indexing Techniques	1086
Industrial Robots	327
Industry Sector	1053
Influence	1181
Information Diffusion	1181
Information Extraction	908, 1072
Information Filtering	1093
Information Flow	2165
Information Retrieval from the Web	32
Information Storage and Retrieval	1086
Information Visualization	1594
Informational Privacy	1370
Information-Centric Networking	627
Infrastructure as a Service	1719
In-Memory Database Technology	18
In-Memory System	2072
Input Output Conformance Simulation	1781
Intellectual Property Protection	1957
Intelligent Agent	505
Intelligent System	195
Intelligent Techniques	1661

Intensional	2119
Interaction Design	182
Interactional Behavior	233
Interactive Applications	163
Interactive Learning	267
Interactive Learning Environment	239
Interactive Music Systems	1759
Interactive Tv	1278
Intercession	1978
Interference	673, 716
Internet of Things	640
Interoperability	270
Invasive Software	2127
IoT	488
IR-based Approach	382
Item Representation	1060
Itemset Mining	857
Iterated Local Search	769
Iterative Improvement	353
ITIL	1189

J

JADE	2239
Java	2087
Java Virtual Machine	1797
Javascript	798
JIT	1970
Jitter	659
Join Algorithm	988
Joinpoints	1480
Joint Topic Sentiment Models	819

K

K Nearest Neighbors	954
Key Agreement	169
Key-based Search	646
Kicking Device	295
Kinect	66
K-Means	831
Knapsack Problem	118
Knowledge Compilation	1887
Knowledge Domains	747
Knowledge Integration	402
Knowledge Management	382
Kuramoto Model	1160
KVM Virtualization	2288

L

L1-Graph	813
Label Propagation	926
Languages	1315
Languages for Probabilistic Logic and Learning	1887
Last Level Cache	1913
Late Binding	1641
Latency	659
Layer 2 Multicast	2212
Lazy Evaluation	2079
Learning	208, 345
Learning Object	261
Learning Vector Classification	195
Leavo Caching	2047
Legal Reasoning	376
Lexical-Semantic Resource	402
Lexicon-based Methods	845
Limited-Resources	548
Linear Programming	2122, 2245
Link Classification	1174
Link Prediction	1099, 1136
Linked Data	368, 396
Local Features	92
Local Permission	2292
Locality	813
Localization	708
Locks	2099
Log Analysis	1263
Logging	1559
Logic Programming	2122
Long-Tail	1031
Loop Closure	289
LTE	627
Lucas&Kanade	96

M

Machine Learning	32, 102, 110, 967, 1099, 1644, 1696
Macros	1986
Maintenance	1358
Management	640
Managerial Decision-Making	1498
Map Reduce	442
Mapping Behavior Model to Architecture Model	1624
Mapreduce	981, 1664
Map-Reduce	837
Markov Chain Usage Models	1803
Matrix Factorization	947, 963, 1099, 1105
mCRL2	1781

MCSP	662
MDE	596
MDX Queries	1008
Measurement	1580, 1602
Measurement Tooling	2198
Medium Access Control	634
Memory	1297
Memory Allocator	2054
Memory Bugs	2107
Memory Management	2001
Memory Monitoring	1765
Memory Sharing	2033
Meta Recursion	1978
Metadata	1105
Metaheuristic	1696
Meta-Process	1411
Meta-Programming	2119
Metasearch Algorithms	1672
Meta-Tracing	1970
Methodologies	1364
Methods	1518
Metrics	680, 753, 1047, 1526, 1580
Microarray Probesets Reannotation	3
Microblogging	1066
Micro-Blogging	1174
Middleware	442, 596, 640
Middleware Platform	488
Migration	2285
Minimal Correction Sets	1773
Mining Bug Repository	1553
Mining under Multiple Constraints	908
Missing Data	102
Mixins	1992
Mobile App Stores	585
Mobile Application Testing	535
Mobile Applications	1631
Mobile Cloud Computing	555, 569, 577, 2285
Mobile Collaboration	509
Mobile Computing	798
Mobile Device	542, 2299
Mobile Devices	169, 2134
Mobile Platform Heterogeneity	577
Mobile Security	2299
Model based Testing	1759
Model Checking Minimisation	1781
Model Driven Engineering	1624, 2087
Model Refinement Rules	1468
Model Transformation	1492, 1547

Model Trees	871
Model-based Design	1948
Model-based Testing	1737
Model-Checking	1688
Model-Driven Architecture	1948
Model-Driven Development	1854
Model-Driven Engineering	810, 1486
Modelling	314
Modelling Strategy	1211
Models	1344
Modularity	1648
Moga Initialization	118
Molecular Docking Simulations	54
Monitoring	1376, 1789, 1857
Monotonicity	851
Monte Carlo	448
Motion Capture Device	143
Motion Estimation	96
Motivation	214, 227
mRNA Sequence Alignment	3
Multi-Agent System	335
Multiagent Systems	301
Multi-Agent Systems	295, 327, 494
Multi-Armed Bandit	740
Multiclass Classification	563
Multicore	1297
Multi-Criteria	1383
Multi-Dimensional Indexing	973
Multi-Document Summarization	339
Multi-Instantiation	1231
Multi-Label	954
Multi-Label Classification	885
Multi-Layer Cloud Tracking	2225
Multilinguality	382
Multimedia	1257, 1270
Multimedia Databases	1023
Multi-Objective	133
Multi-Objective Optimization	110, 118
Multiple Clustering	915
Multiple Features	86
Multiprocessor Platform	1925
Multi-Robot	307
Multirobot Systems	301
Multi-Robot Systems	314
Multi-Scale Description	1468
Multi-Scale Modeling	1405
Multisensor Fusion	563
Multi-Tenancy	2141

Multi-Version	1309
Multi-View Learning	865
Mutual Authentication	169
Mutual Influence	1123

N

Naive Bayes Model	1136
Natural Language Generation	1868
Natural Language Processing	908
Navigational Model	783
NCL	1285
Network Analysis	1129
Network Centrality	1181
Network Connectivity	301
Network I/O Performance	515
Network Motifs	10
Network Overlay	665
Network Performance	634
Network Selection	680
Network Speed	615
Network Topology	646
Network Traffic	659, 1263
Network-As-A-Service	2257
Networking	1940
Neural Networks	954
News Recommendation	732
News Streams	1039
N-Grams	548
NIALM	2218
Noise Addition	2218
Non- Functional Requirements	1383
Non ICT User	182
Non-Blocking	1321
Non-Cooperative Behavior	1154
Non-Functional Requirements	1376
Nonparametric Clustering	893
Non-Redudant Clustering	915
Non-Traditional Control Devices	239
Non-volatile (NV) Memory	2021
Non-Volatile Memory	2069
Non-Zero Quantized Transform Coefficients	1291
Novelty Detection	935
NUCA	1919
Numerical Weather Prediction (NWP)	2225
Nvidia Cuda	879

O

Object-Oriented	1992
Obstacle Analysis	1401
Obstruction	1245
ODFC	2279
ODFD	2279
OER Repositories Integration	270
Offloading	569, 577
Omission Errors	1962
On Device Detection	548
On-Demand Quality Attributes	1464
Online Learning	947
Online Learning Environments	233
Online News Portals	1039
Online Robust-Pca	86
Online Search	1078
Online Social Networks	1181
On-Shelf Time	857
Ontologies	201, 327
Ontology Engineering	376
Ontology Pattern Language	388
Ontology Patterns	388
Open Educational Resources	270
OpenACC	96
Openacc	1329
OpenFlow	2212
OpenMP	96
Operating System	2072
Operating Systems	2027
Operating Systems' Caching Parameters	2066
Operational Semantics	2079
Opinion Mining	819
Optic Nerve	26
Optimal Planning	428
Optimization	769, 1015, 2079
Orocos-RTT	1948
OS Kernel	2054
Outsourcing	2134
Overlapping Community	1136
OWL	345

P

P2P	501
Page Cache	2001
Page Replacement Algorithm	2001
Pairwise Combination	941
Pairwise Learning	409
Pairwise Voting	941

Parallel	1321
Parallel Algorithms	1335
Parallel File Systems	2066
Parallel Genetic Algorithms	1664
Parallel Query Processing	1023
Parallel Systems	879
Parallel Task Model	1925
Parasitic Malware	2127
Parsing	1986
Partial Data Replication	1309
Partial Evaluation	1504
Partitional Clustering	831
Partitioning	569, 577, 1015, 2285
Partitioning Graph	1874
Patchwork	1874
Pattern Analysis in Social Networks	1142
Pattern Discovery	908
Pattern Extraction	851
Pattern Growth	919
Patterns	2119
Pedagogical Recommendations	233
Peer-To-Peer	509
Peer-To-Peer Networks	646
Performance	501, 627, 753, 1297, 1315, 1711, 2069, 2141, 2185
Performance Analysis	2066
Performance Constraint	1913
Performance Evaluation	569, 680, 716, 1000, 2054
Performance Metrics	1641
Performance Model	442, 2066
Performance Modelling	592
Performance Prediction	967
Performance Profiling	2015
Performance, Communication	646
Personal Data Server	2165
Personal Information	1425
Personal Recognition	59
Personalization	1008, 1252
Personalized Ranking	1105
Personalized Search	1031
Phase Change Memory	2001
Physical Layer	662
Poetry	1868
Pointcuts	1480
Points-To Analysis	1962
Portability	1364
Positive-Only	963
Power Allocation	673
Power Consumption Analysis	1957

Power Grid	2192
Power Law	960
Power Optimisation	1913
Power-Aware Computing	464
Prediction Model	247
Preference	1047
Presentation Engine	1278
Presentation Machine	1285
Pricing	1719
Principal Component Analysis	701
Prisoner	335
Privacy	1425, 1573, 2218, 2271, 2299
Privacy Analysis	901
Privacy Protection	2320
Probabilistic Model Checking	428
Problog	1887
Process Assessment	1189
Process Calculi	1840
Process Improvement	1189
Process Mining	1195, 1225, 1231, 1657
Process Placement	2033
Process Tailoring	1657
Product Attribute Matching	761
Product Line Architecture	1441
Profiling	548
Program Analysis	1962
Program Transformation	1729
Programmable Matter	314
Programming Competitions	2122
Programming Language	331
Programs from Proofs	1729
Proof Carrying Code	1729
Provenance	2165
Provisioning	1696
Pseudo Normal Distribution	688
Publish/Subscribe	1688
Pull Request	1541
Pull Request Assignment	1567
Pull-based Development	1567

Q

QoS	659
Qos Monitoring	1672
Qr Code	2157
Qualitative Constraint-based Reasoning	1874
Quality Assurance	535
Quality of Service	1672
Query Operator	988

Query Suggestion	740
Queue	1321
Quic	609
QVT	1492

R

RAID	2007, 2047, 2288
RAID Arrays	2015
Random Testing	1797
Random Walks	2312
Rational Drug Design	54
RDF	396
RDF Chain Query Optimization	353
RDF Indexing	416
RDF Processing	368
RDFpro	368
Reachability Testing	1512
Reactive	802
Reactive Systems	283
Read/Write Disturb	1906
Real Networks	1160
Real Time Systems	1751
Real-Time	669, 802, 1066
Real-Time Communications	653
Real-Time Operating System	1892
Real-Time Scheduling	1940
Realtime Systems	1759
Real-Time Systems	1925
Real-World Applications	314
Received Signal Strength Indicator	708
Recency	963
Recommendation	1008, 1047
Recommendation System	264
Recommendation Systems	1294
Recommender Systems	189, 732, 879, 947, 963, 1039, 1060, 1105, 1148, 1457
Reddit	747
Refactoring	640, 1534, 1661
Reference Architecture	1425
Refinement	1992
Refinement-based Modeling	1651
Reflection	1978
Reflectogram	1978
Regression	871
Regression Trees	102
Regulatory Compliance	1401
Rehabilitative Gaming	143
Reinforcement Learning	335
Relation Extraction	423

Relational Databases	2165
Reliability	456, 2039
Reliability Enhancement	1906
Reliability-Aware Striping	1906
Remix	1270
Remote Execution	798
Replication	2072
Reputation	1344
Reputation Management	2320
Requirement Specification	1390
Requirements Analysis	1358
Requirements Models	1350
Requirements Traceability	1358, 1364
Rescheduling	501
Resource Augmentation	2245
Resource Marketplace	2305
Resource Reservation	653
Resource-Performance Trade-Offs	555
Response Time	1711
Rete	802
Retrieval	1072
Reuse	1390
Reuse Models	2115
Reuse of OER	270
Ring Buffer	1321
Risk Assessment	791, 1401
Risk Management	125
Risk Reduction	1504
RoboCup	295
Robotic Navigation	289
Robotics	295, 307, 320, 1948
Robust Optimization	277
Robustness	1815
Rooms Assignment	264
Routing	662
Rule Mining	201
Rule-based Techniques	1661
Runtime Assertion Checking	1765
Runtime Enforcement	1789
Runtime Monitoring	2107
Runtime Variability	1641
Runtime Verification	1933

S

SAC-ASM	1704
Safety	471, 2119
Salient Points	74
Sampling	994

Sampling Large Scale Social Networks	960
SAT Solver	1880
Scalability	464, 592, 1297
Scalable	802
Scalable Algorithms	893
Scene Segmentation	1257
Schedulability Analysis	1925
Scheduler	2263
Scheduling	2027, 2033, 2060
Scientific Workflows	54
Score Fusion	66
Scrum, Kanban	1518
SDN	2212
SDPY	609
Search based Software Engineering	1449, 1664
Search Engine	806
Search Result Diversification	994
Secure Web Sessions	2149
Security	621, 1344, 2185, 2231
Security Assessment	2299
Security Attack	1711
Security Mapping	2177
Security Measure	1263
Security Middleware	2141
Segmentation Algorithms	753
Self Adaptive Systems	1464
Self Coexistence	2279
Self Dimensioning	769
Self-Adaptation	428, 1704
Self-Adaptive Systems	1857
Semantic	409
Semantic Analysis	339
Semantic Integration	270
Semantic Interoperability	388
Semantic Role	339
Semantic Search	402
Semantic Triples	339
Semantic Web	327, 402
Semantics	396, 1840
Semantics-Driven Recommendation	732
Semi-Structured Data	1086
Semi-Supervised Clustering	831
Semi-Supervised Learning	865
Sensing-As-A-Service Platform	592
Sensor Data Mining	527
Sensors	2271
Sentiment Analysis	819, 845, 1060
Sequence Diagram	1492

Sequential Data Mining	908
Serious Game	239
Server-based DAG	1925
Service Delivery Platform	2257
Service Level Agreement	1219
Service Networks	1219
Service Performance	2257
Service-Oriented Applications	1704
Service-Oriented Process Lines	1680
Servoing	320
Session Fixation	2171
Session Hijacking	2171
Session Management	2171
Severity Prediction	1553
SF-IDF+	732
Shape Description	74
Shared Cache	1015
Shared Data Deployment	2245
Shortest Path	80
SIFT	1252
Similarity Joins	967
Similarity Search	994, 1023
Simulated Annealing	353
Simulation	708, 1370
Simulation Tools	314
Simulink	1547, 1933, 1940
Single Nucleotide Polymorphism	18
SLA Composition	1219
SLAM	289
SLR	1594
Small World	360
Small Write Problem	2047
Smart City	163
Smart Grid	2212
Smart Metering	2218
Smart Meters	2231
Smart Phone	527
Smart Web Browser	2149
Smartgrid	2231
Smartphones	577
Smell Classification	195
Smell Measurement	195
SMT-Solving	1745
SOA	1680
SOAR	1411
Soccer Robots	295
Sociability	149
Social and Behavioural Sciences	474

Social Computing	163
Social Curating Service	806
Social Gaming	2239
Social Network	1117, 1174
Social Network Analysis	935, 1136
Social Networking Services	1184
Social Networks	189, 915, 1136, 1154
Social Status	1123
Software Architecture	480, 1411, 1417, 1433, 1457, 1464
Software Architectures	1468
Software Components	2127
Software Defined Network	2257
Software Development Projects	1498
Software Engineering	1610, 1797
Software Evolution	1616
Software Maintenance	1553
Software Metrics	175, 1498
Software Metrics Semantic	1498
Software Model Checking	1745
Software Platform	2239, 2271
Software Process	388, 1657
Software Process Lines	1680
Software Process Model	1518
Software Product Line	1441, 1449, 1616
Software Product Lines	1376, 1602
Software Psychology	474
Software Quality	1184, 1722
Software Reengineering	810
Software Testing	1512
Software Testing Process	1722
Software Topology	1654
Software-As-A-Service	2141
Software-Defined Network	640
Software-Defined Networking	665
SOLAP System	1008
Solar Irradiance Forecast	2225
Solid State Drive	2015, 2039
Sorted Neighborhood Method	981
Sorting	368
Source-Location Privacy	688
Source-To-Source Compilation	2107
Sparsity	813
Spatial Databases	973
Spatial Similarity	1008
Spatial Simulation	1854
SPEA2	125
Specialization	1504
Specification Language	1637, 1765

Specification-based Test Generation	1815
Spectral Analysis	2305
Speech Recognition	1350
SSD	2007, 2060
SSD Cache	2047
Stackelberg Security Games	277
Stacking Technique	26
Standards Harmonization	388
State Estimation	2192
Statechart	1397
Static Analysis	1933
Static Energy	1913
Statistical Testing	1803
STEM	247
Stereo Videos	926
Stochastic Games	208
Stochastic Multiplayer Games	428
Storage	2039
Storage Device Drivers	2021
Strategic Planning Process	1211
Stream Mining	947
Streaming	368
Structural Balance	1117
Student Participation	254
Students' Interactions	227
Subsumption Detection	409
Subterfuge Safe Authorisation Language	2292
Summarization	1252
Supervised Learning	102, 585
Supervised Machine Learning	423
Sustainable Software	2198
Swarm	307
Sybil Attacks	2312
Symbolic Exploration	1737
Symmetries	1751
Synchronous Observer	1933
Synthetic XML Data	724
System Integration	1624
System Management	2263
System of Systems	1411
System Verification	1803
Systematic Literature Review	1433
Systematic Review	1594
Systems of Systems	1433

T

Tags	409
Taint Analysis	1573
Target Identification	307
Task Recording	783
Taxonomic Relation	423
Taxonomy	456
Telecommunication Networks	960
Teleo-Reactive	283
Telescope Network	2263
Temporal Analysis of Social Networks	1142
Temporal Correlation	589
Temporal Expressions	1093
Temporal Isolation	653
Temporal Role Hierarchies	2177
Temporal Role-based Access Control	2177
Tensor Space Model	922
Test Automation	775
Test Suite Migration	775
Testing	1534, 1559
Text Layout	423
Text Mining	845, 922
Text Summarization	339
Text-Driven Forecasting	1167
Thesaurus Mapping	382
Thompson Sampling	740
Threads	2099
Throughput	659, 1711
Thunk	2079
Tight Constraint	2075
Time Complexity	1160
Time Composability	1892, 1955
Time Petri Nets	1751
Time Predictability	1892
Timed Automata	1688, 1759
TIPA	1189
Tool	1390
Tool Evaluation	2198
Tools for Constraint Solving	1861
Topic Hierarchies	1105
Topic Models	819, 1078
Trace Monitoring	1637
Traceability	1486
Traceability Languages	1358
Traceability Process	1364
Trace-based Debugger	1962
Trade-Off	2271
Traffic Rules and Violations	239

Trains	505
Trajectory Synchronization	1339
Transaction Semantics	1827
Transactional Memory	2093
Transparent Optical Networks	662
Travelling Salesman Problem	118
Treaty	125
TREC	1066
Tree Decomposition	1874
Tree Structures	919
TR Soccerbots	283
Trust	1344, 2312
Trust Indexing	2305
Trust Management	2328
TSI	2225
Tuplespace	1827
Type Systems	1986
Types	2119

U

Ubiquitous Computing	163
UML	1344, 1492, 1547
UML Notations	1468
Uml Profile	1854
Uncertain Data	919
Under Approximation	1737
Unified Process, Extreme Programming	1518
Universal Topic Framework	1078
Unmanned Vehicles	331
Unsupervised Learning	893
Urban Computer	163
Usability	175, 1526
Use Case Diagram	1602
Use Case Fragment	1390
User Experience	149
User Group	1047
User Intention	1174
User Interface	182
User Interfaces	175
User Understanding	1174
User-based Evaluation	239
User-Centered Design	182
Users and Context-Modeling	1078
Users Profiles	1047
Utility	680
Utility Mining	857
Utility Theory	2218

V

Value Classes	1970
Value Sensitive Design	1370
Vanets	695
Variability	1376
Variant Calling	18
Variation	1657
VCCN	695
Vector Space Model	922
Vehicle Networks	331
Verification	1688, 1729, 1751, 1773, 1992
Victim Retention	1919
Video	1252, 1270
Video Shot Representation	1257
Video Streaming	669
Video Watermarking	1291
Video-On-Demand (Vod)	1291
Viral Marketing	1181
Virtual Block	1648
Virtual Machine Migration	615
Virtual Map	542
Virtual Museum	806
Virtual Reality	267, 480
Virtualization	464, 2033
Visual	320
Visual Algorithm Simulation	220
Visual Analysis	1263
Visual Analytics	1294
Visual Cohesion	1526
Visual Dictionaries	92
Visual Features	1257
Visual Identification	542
Visual Similarity	289
Visual Testing	775
Visual Text Mining	1594
Visual Words	74, 92
Visualization	1270, 1857
Vital Documents	1093
VND	1117
Voting Strategies	941
VTM	1594
Vulnerabilities	2231
Vulnerability	2192

W

WADE	2239
Wait-Free	1321
Waiting Time	2075

WCAG 2.0	157, 1184
WCET Analysis	1955
Wearable Sensors	521, 563
Weaving	1480
Web Accessibility	157, 1184
Web Application	1425
Web Application Testing	783
Web Applications	802, 810
Web Page Segmentation	753
Web Product Descriptions	761
Web Security	2149, 2171
Web Service	1425
Web Service Framework	1711
Web Services	468, 1688
Web Table Context	1072
Web Table Search	1072
Web Technology	32
Web Testing	775
Web-based Maps	157
Web-based Services	1680
Website Classification	1053
Weighted Model Counting	1887
Weighted Networks	10
Wikipedia	922, 1099
Wireless Mammogram Imaging	2252
Wireless Network Virtualization	602
Wireless Networks	169
Wireless Sensor Networks	589, 621, 708, 716
WLANs	673
Wordnet	747
Workflow Resilience	1245
Workflow Satisfiability	1245
Workflow-based Systems	1641
Workload Characterization	442
Worst-Case Execution Time Analysis	1898
WRAN	2279
Write Buffer	2039
Write Performance	2288
Write Through	2047
WSN	688
WWW	1278

X

X-Frame-Options	791
XML	1086
XML Data Generator	724
Xpath Queries	724



Author Index

Scroll to the author and select a [Blue](#) link to open a paper. After viewing the paper, use the bookmarks to the left to return to the beginning of the Author Index.

A

A G, Rekha	931
Abbes, Rafik	1093
Abd Alrahman, Yehia	1840
Abdalla, Gabriel	1417
Abdennadher, Slim	1868
Abdi, Lotfi	1291
Abdi, Samane	2292
Abella, Jaume	1955
Abeywickrama, Dhaminda B.	1857
Abib, Janaina	163, 182
Accorsi, Rafael	1245
Agrawal, Ashish	1464
Ahmed, Syed Hassan	695
Ahn, Hwi	1668
Ahn, Jaegyoong	47
Ahrndt, Sebastian	474
Aissi, Saida	1008
Albayrak, Sahin	474, 1039
Alberti, Antonio Marcos	501
Alberti, Francesco	1745
Aldea, Adina	1211
Aldrich, Jonathan	1986
Alemerien, Khalid	1526
Alencar, Namom	988
Ali, Irfan	1148
Almalaise, Abduallah	1203
Almeida, André	1376
Almeida, Diogo	175
Almeida, Hyggo Oliveira de	1498, 2218
Almeida, Luis	653, 669
Almgren, Magnus	2204
Alonso, Diego	283
Alves, Everton L.G.	1534
Aly, Heba	563
Amadini, Roberto	1861
Amadori, Marco	368
Amaral, Leonardo Albernaz	488
Aminikhanghahi, Samaneh	2252
Amo, Sandra de	831

Anacleto, Junia C.	163, 182
Andrade Ribeiro, Leonardo	967
Andrade, Guilherme	1335
Andrade, Rossana	1719
Andrade, Wilkerson L.	1358, 1364
Anjum, MD Nashid	2279
Araujo, Filipe	456
Araújo, João	1350
Arbiza, Lucas M.R.	640
Assad, Rodrigo	1719
Ávila, Bráulio C.	505
Awad, Ahmed	1203
Azevedo, José Luis	295
Azevedo, Leonardo G.	1441
Azevedo, Ryan Ribeiro de	376

B

Baarir, Souheib	1518
Bačiková, Michaela	2115
Badouel, Eric	1834
Bae, Duck-Ho	2060
Bahsoon, Rami	1401
Baier, Thomas	1225
Balby Marinho, Leandro	402
Baldochi Jr., Laércio A.	783
Baniasadi, Amirali	1329
Barafort, Béatrix	1189
Barbieri, Tamires T.S.	1257
Barbosa, Pedro	2218
Barbosa, Valmir C.	769
Barcellos, Monalessa P.	388
Barcelos, Celia A.Z.	74
Barddal, Jean Paul	935, 941
Barioni, Maria Camila N.	831
Barn, Balbir	1242, 1370
Barn, Ravinder	1370
Barnawi, Ahmed	1203
Barreto, Felipe Mota	596
Barrington, Andrew	1321
Barros, Flávio M.M.	1105
Barros, Heitor	270
Barros, Patricia Vieira da Silva	376
Barros, Rodrigo C.	102, 110
Basgalupp, Márcio P.	110
Basilio, Giovanna G.	673
Basso, Tania	1425
Basten, Dirk	1722
Bastos, Carlos A.M.	2212

Batista, Leonardo V.	59
Batista, Thais	1376
Beal, Jacob	1846
Béchet, Nicolas	908
Beckers, Kristian	1344
Behnam, Moris	653
Bekkouche, Mohammed	1773
Bellatreche, Ladjel	509
Ben Abdallah, Faten	1291
Ben Attia, Maroua	548
Ben Messaoud, Montassar	264
Ben Said, Lamjed	1008
Ben Yahia, Sadok	851
Ben-Abdallah, Hanène	1602
Bencomo, Nelly	1376
Bendraou, Reda	1518
Berardi, Giacomo	585, 1053, 1066
Berbers, Yolande	555
Bergenti, Federico	2239
Bertholdo, Leandro M.	640
Berthomieu, Bernard	1751
Berton, Lilian	1136
Bessa Maia, Jose E.	589
Bezerra, Eduardo	208, 915
Bi, Bin	1078
Bi, JingJun	926
Bianchi, Thiago	1433
Bicharra Garcia, Ana Cristina	201
Bifet, Albert	954
Bispo, João	1315
Bittencourt, Ig Ibert	227, 233
Blomberg, Luciano C.	102
Bochicchio, Mario A.	1219
Bodenstaff, Lianne	1211
Bodmann, Bardo E.J.	1123
Bogaerts, Jasper	2141
Bogoni, Tales	267
Bohdanowicz, Frank	708
Boito, Francieli Z.	2066
Bolz, Carl Friedrich	1970
Bommaganti, Hari	1078
Borges, André P.	505
Borst, Sjoerd	761
Bossuet, Lilian	1957
Botella, Guillermo	96, 1339
Bouasker, Souad	851
Bouassida Rodriguez, Ismael	1405
Bouassida, Nadia	1602

Boudriga, Nouredine	621
Boughanem, Mohand	1093
Bouk, Safdar H.	695
Bourdil, Pierre-Alain	1751
Bouwmans, Thierry	86
Bozzon, Alessandro	747
Brante, G.	716
Braun, Bastian	2149
Braun, Torsten	627
Braunschweig, Katrin	1072
Brayner, Angelo	589, 988
Bráz, Sandra	32
Brefeld, Ulf	865
Breitung, Benjamin	474
Bride, Hadrien	1737
Brito e Abreu, Fernando	1657
Brito, Andrey	2218
Brito, Patrick H.S.	1457
Brito, Talles	1086
Buday, Gergely	1823
Bueno, Andre O.	163
Bülthoff, Heinrich H.	307
Burity, Thais	1449
Burkhardt, Sophie	885
Burton, Eden	1992
Busse, Anselm	2033
Byun, Taejoon	1815

C

Cabello-Castillo, J.	2263
Caetano, Artur	1195
Cagnin, Maria Istela	157, 1184
Caire, Giovanni	2239
Calvagna, Andrea	1797
Camacho, Rui	32
Cámara, Javier	428
Cambronero, M. Emilia	1688
Campos, Filipe	468
Campos, José Creissac	175
Cano, Julio	669
Canós, José H.	261
Capelle, Michel	732
Cardia Neto, João Baptista	66
Cardoso, João M.P.	1315
Carlucci, Gaetano	609
Carmichael, Kelly	2231
Carvalho, João Á.	40
Carvalho, Luiz F.	701

Carvalho, Luiz O.	994
Carvalho, Windson Viana de	596
Casanova, Marco A.	254
Castro, Fernando	2027
Castro, Jaelson	1397
Castro-Tirado, A.J.	2263
Cavalcante Rocha, Arthur Max	99
Cavalcante, Everton	1376
Cavalcanti Jr., N.L.	59
Cavalcanti, Paulo	1397
Cavalheiro, Gerson Geraldo H.	2093
Cavalheiro, Simone	1547
Cazorla, Francisco J.	1955
Ceccarelli, Diego	1066
Cellier, Peggy	908
Cerny, Tomas	646
Cerqueira, Renato F.G.	1441
Cesário Times, Valéria	1000
Cha, Youngchul	1078
Chakraborti, Swapnajit	1110
Chakraborty, Shounak	1913
Chan, Alvin T.S.	1553
Chander, Deepthi	592
Chang, Che-Wei	2245
Chang, Jae Young	922
Chang, Keng-hao	1078
Chang, Yuan-Hao	1906, 2245
Chang, Yu-Ming	1906
Charafeddine, Hadil	1789
Charnois, Thierry	908
Charuvaka, Anveshi	837
Chaudhary, Ankit	1112
Chaudhuri, Arindam	659
Chaver, Daniel	2027
Chaves e Silva, Lenardo	1498
Chaves, Rodrigo	1335
Chen, Shuai	2157
Chen, Ye	1078
Cheng, Long	416
Cheng, Sheng-Wei	2245
Cheng, Shuxin	515
Chetlur, Madhavan	1480
Cho, Junghoo	740, 1078
Cho, SungWoo	2060
Cho, Yookun	2072
Chodarev, Sergej	2115
Choi, Yunja	1815
Choobdar, Sarvenaz	10

Chugh, Amandeep	592
Cinalli, Daniel	133
Clark, Tony	1242
Clua, Esteban	1303
Coelho, Roberta	1616
Colantonio, Alessandro	1294
Collado, Jorge	96
Collavizza, Hélène	1773
Condori-Fernández, N.	1559
Condotta, Jean-Francois	1874
Consiglieri, Daniel	163
Constantinou, Eleni	1580
Corcoglioniti, Francesco	368
Cordeiro, Mário	960
Córdoba, Irene	2087
Cortes, Omar A.C.	125
Costa, Andrei	1547
Costa, Cristiano André da	501
Costa, Evandro	270, 1457, 1661
Costa, Philipp B.	577
Costas, Vassilakis	1672
Couture, Mario	548
Crémilleux, Bruno	908
Cremona, Fabio	1940
Cristo, Marco	1099
Cruz Lopes, Claudivan	1000
Cruz, Ana Beatriz	208
Cruz, Andrea	32
Cruz, Sérgio Manuel Serra da	247
Cunha, Bernardo	295
Curcio, Igor D.D.	1270
Cuzzocrea, Alfredo	919

D

da Rosa Righi, Rodrigo	501
da Silva Junior, José Ricardo	1303
da Silva, Alan Pedro	227, 233
da Silva, Eunice Palmeira	376
da Silva, Tiago Silva	1594
Dabain, Haneen	1586
Dabrowski, Frédéric	2099
D'Addio, Rafael M.	1060
Dal Zilio, Silvano	1751
Daniel, Sérgio	1335
Dantas, Francisco	1376
Dantas, Mario A.R.	2066
Darabi, Kaveh	1252
Das, Shirshendu	1913, 1919

Dasgupta, Koustuv	592
D'Avanzo, Loris	1631
Davison, Richard	143
de Andrade Lopes, Alneu	1136
De Araújo Júnior, José Gildo	402
de Bayser, Maximilien	1441
de Bona, Luis C.E.	665
de Campos, Gilda H.B.	254
de Carvalho, Luis Alberto Vieira	26
de Castro, Valeria	810
De Cicco, Luca	609
de la Iglesia, Eduardo	1339
de Lara, Juan	2087
de Macedo, Douglas D.J.	2066
de Matos, Everton	488
de Matos, Luciana	26
De Meuter, Wolfgang	802
De Nicola, Rocco	1840
de Oliveira, Daniel	769
de Oliveira, João E.M.	1160
de Oliveira, Luiz Paulo Luna	1123
de Paula Junior, Ubiratam	769
de Paulo Faleiros, Thiago	1136
De Ryck, Philippe	2171
de Sousa, Luís	1854
de Souza, Amanda Caniatto	26
De Souza, José N.	577
Decat, Maarten	2141
Dechev, Damian	1321
Del Fabro, Marcos D.	665
Del Monego, Hermes I.	673
Demuth, Andreas	1486
Denker, M.	1978
Denneulin, Yves	2015
Dermouche, Mohamed	819
Desmet, Lieven	2171
Di Natale, Marco	1940
Di Pietro, Roberto	1294
Dias, Diego R.C.	480
Dias, Ricardo	295
Díaz, Gregorio	1688
Diener, Matthias	2033
Dieumegard, Arnaud	1933
Dihego, José	1808
Dionisis, Margaris	1672
Domingues, Marcos A.	1105
Donahoo, Michael J.	646
Dordal, Osmar B.	505

Dos Reis, Gabriel	2119
dos Santos, Carlos Raniery P.	640
Dragoni, Mauro	382
Drira, Khalil	1468
Drummond, Lúcia	769, 1117
Du Bois, André Rauber	2093
Duan, Qiang	688, 2257
Duarte, Paulo Artur de Sousa	596
Duarte, Rodrigo Medeiros	2093
Dubugras Alcoba Ruiz, Duncan	825
Ducasse, S.	1978
Duggisetty, Padmaja	2157
Dutra, Inês	879
Dutta, Partha	2305
Dymchenko, Sergii	2122

E

Eberius, Julian	1072
Eckert, Jürgen	1803
Egyed, Alexander	1486
el Bolock, Alia	1868
Elgammal, Amal	1203
El-Harake, Khalil	1789
Elias, Gledson	1086, 1449
Eliassi-Rad, Tina	893
Ellouze, Nourhene	621
Elshawi, Radwa	1203
Elyasov, A.	1559
Enembreck, Fabrício	505, 935, 941
Eom, Young Ik	2001
Epema, Dick	2312
Ernst, Jason B.	680
Eronen, Antti	1270
Esuli, Andrea	585, 1053, 1066
Evangelista, Bruno	2054
Evangelista, Neusa L.	988
Evangelista, Raphael S.	542
Eyre, Janet	143

F

Fabresse, L.	1978
Facco Rodrigues, Vinicius	501
Faget, Zoé	1047
Fagni, Tiziano	585, 1053
Fähndrich, Johannes	474
Fähnrich, Cindy	18
Falbo, Ricardo A.	388

Falcone, Yliès	1789
Faleiro Sidney, Christiane	967
Farhan, Muhammad	185
Farhangi, Hassan	2231
Farias, Kleinner	501
Farshchi, Mostafa	1231
Fauconnier, Jean-Philippe	423
Feldman, Steven	1321
Felizardo, Katia R.	1433
Fernandes Jr., Gilberto	701
Fernandes, Leandro A.F.	542
Fernandes, Natalia C.	2212
Fernández, Alberto	327
Fernandez, Gabriel	1955
Fernandez-Gago, Carmen	1344
Ferreira, Bruno	40
Ferreira, Henrique	1661
Ferreira, João Eduardo	54
Ferreira, Kecia A.M.	1654
Ferreira, Miguel	2198
Ferreira, Mívia M.	1654
Ferreira, Monica R.P.	994
Ferreira, Raoni	1099
Ferreira, Renato	1335
Ferreira, Tais B.	2054
Ferreira, Vinicius	163
Ferrucci, Filomena	1631, 1664
Figueiredo, Rosa	1117
Filho, Gileno	569
Filho, José de Aguiar M.	988
Fongen, Anders	1827
Fonooni, Benjamin	320
Fonseca, Baldoino	1661
Fonseca, José Carlos	1925
Fontinele, Alexandre	662
Fornaia, A.	1573, 1797
Foss, Luciana	1547
Fossati, Luca	1955
Fouquet, François	2271
Fournier-Viger, Philippe	857
Frank, Eibe	871
Franken, Henry	1211
Frasincar, Flavius	353, 732, 761
Freitas, Frederico Luis Gonçalves de	376
Frey, Hannes	708
Frota, Yuri	769, 1117
Fukuda, Hiroaki	1648
Funke, Rafael	708

G

Gabrielli, Maurizio	1861
Gallagher, Brian	893
Gama, João	947, 960, 963
Gançarski, Stéphane	753
Garcia, Ana Cristina Bicharra	133
Garcia, Carlos	96, 1339
Garcia, Cleiton	1680
Garcia, Vinícius	1719
Garlan, David	428
Garoché, Pierre-Loïc	1933
Gassara, Amal	1405
Gattass, Marcelo	80
Gazziro, Mario	1129
Gehani, Ashish	1504
German, Reinhard	1803
Gervais, Marie-Pierre	1518
Ghinea, Gheorghita	1252
Ghosh, Soumya K.	659
Giannone, G.	1573
Gimenes, Gabriel P.	1129
Gkorou, Dimitra	2312
Goldner, Eliana L.	80
Gomes, Andre	627
Gomes, Francisco Anderson de Almada	596
Gomes, Heitor Murilo	935, 941
Gómez, Abel	261
Gonçalves Jr., Ronaldo	1383
Gonçalves, Luís	40
Gonçalves, Marcelo Benites	1411
Gonçalves, Marcos	1335
Gonzalez Boix, Elisa	802
Gonzalez, Luis Fernando Planella	825
Gorgônio, Kyller Costa	1498
Goto, Hayate	1263
Gotta, Danilo	2239
Gouider, Mohamed Salah	1008
Goularte, Rudinei	1257
Granitzer, Michael	1031
Granville, Lisandro Z.	640
Gravino, Carmine	1631
Gregorio-Rodríguez, Carlos	1781
Griffin, Christopher	1154
Größl, Martin	436
Gualdron, Hugo	1129
Guedes, Gustavo Paiva	915
Guessi, Milena	1417, 1433
Guetmi, Nadir	509

Guimarães, Marcelo P.	480
Guizzardi, Giancarlo	388
Guo, Shuo	2157

H

Haddad, Hisham	791
Hadj Kacem, Ahmed	1468
Hadj Kacem, Mohamed	1468
Hadjali, Allel	1047
Hage, J.	1559
Hamatani, Takashi	521
Hamou-Lhadj, Abdelwahab	548
Han, Hwansoo	2069
Han, Hyoil	339
Han, Shuchu	813
Härder, Theo	967
Hartmann, Thomas	2271
Hassel, Michael	535
Hegde, Vinay	2305
Hehenberger, Peter	1486
Heisel, Maritta	1344
Heiser, John	2225
Heiß, Hans-Ulrich	2033
Hellström, Thomas	320
Hélouët, Loïc	1834
Henderson, Keith	893
Heras, Stella	189
Herbert, John	2292
Hernandez, Nathalie	1093
Hessel, Fabiano	488
Hexsel, Roberto	634
Higashino, Teruo	521
Hirata Jr., Roberto	2328
Hirschfeld, Robert	1970
Hogenboom, Alexander	353
Hogenboom, Frederik	732
Holderer, Julius	1245
Holl, Konstantin	535
Holubová, Irena	724
Homm, Daniel	1803
Hong, Jiman	2072, 2285
Hong, Kee-Joo	922
Houben, Geert-Jan	747
Howey, Clay	2231
Hozano, Mario	1661
Hsieh, Chu-Cheng	740
Hsiu, Pi-Cheng	2245
Hu, Fei	515

Huang, Dong	2225
Huang, Hao	813
Huang, Jun	688, 2257
Huang, Po-Chun	1906
Hübler, Patricia	54
Hughes, Danny	555
Hung, Shih-Hao	798
Hwang, Taegye	2072

I

Iacob, Maria-Eugenia	1211
Iftikhar, Nadeem	1015
Ikeda, Yoshinori	195
Imine, Abdessamad	509
Inacio, Eduardo C.	2066
Iqbal, Mohsin	845
Iqbal, Zahid	653
Ishikawa, Hiroyo	806
Ismail, Mohamed A.	563
Isotani, Seiji	214, 233
Israel, Quinsulon	339
Ivaki, Naghmeh	456
Iwasaki, Hideya	2079

J

Jaber, Mohamad	1789
Jacquemard, Florent	1759
Jagroep, Erik	2198
Jakobs, Marie-Christine	1729
Jakobsson, Arvid	1765
Jamhour, E.	673, 716
Jang, Joonhyouk	2072
Jansen, Milan	353
Jansen, Slinger	2198
Janssens, Gerda	1887
Jaques, Patricia	233
Javed, Sajid	86
Jeon, Soon I.	2252
Jeong, Daye	47
Jeremic, Nikolaus	2007
Jesus, Flávio Rezende de	783
Ji, Hyunho	2285
Jino, Mario	1425
Jmaiel, Mohamed	1405
Jo, Seunghyun	139
Jo, Yong-Yeon	2060
Johns, Martin	2149

Joosen, Wouter	2141, 2171, 2185
Jorge, Alípio	879, 947, 963
Jorge, Javier	189
Joselli, Mark	1303
Joshi, Prachi	1624
Julian, Vicente	189
Julliand, Jacques	1737
Jung, Edward	1957
Jung, Soon Ki	86
Justel, Claudia M.	289

K

Kahsai, Temesghen	1933
Kalb, Paul	2225
Kambona, Kennedy	802
Kamel, Mouna	423
Kamiran, Faisal	845
Kaneko, Kunitake	806
Kang, Dong Hyun	2001
Kang, Sooyong	2039
Kaplanis, Athanasios	973
Kapoor, Hemangee K.	1913, 1919
Karim, Asim	845
Karpov, S.	2263
Kassing, Simon	747
Katsalis, Kostas	602
Kechadi, M-Tahar	1664
Kendea, Marios	973
Kerschbaum, Florian	2134
Khan, Murad	720
Khelladi, Djamel-Eddine	1518
Khenfri, Fouad	1960
Khlif, Ilhem	1468
Khosravifar, Babak	548
Khouas, Leila	819
Kilamo, Terhi	149
Kim, Dae-Kyoo	1492
Kim, Dongkyun	695
Kim, Dongwook	2039
Kim, Hanil	2285
Kim, Han-joon	922
Kim, Junghoon	2001
Kim, Pankoo	2285
Kim, Sang-Wook	1148, 2060
King, Tracy	740
Klein, Jacques	2271
Ko, Byeongkyu	2285
Koc, Mehmet	901

Kokoschka, Andreas	2320
Korakis, Thanasis	602
Koskinen, Johannes	149
Kosmatov, Nikolai	1765
Kotoulas, Spyros	416
Kouamou, Georges-Edouard	1834
Kramer, Stefan	871, 885
Kremer, Stefan C.	680
Krishnan, P.	1637
Krutz, Daniel E.	1610
Kuhlen, Torsten W.	480
Kulesza, Uirá	1616
Kulkarni, Vinay	1242
Kumar, Amit	592
Kumar, P. Sreenivasa	396
Kunde, Shruti	442
Kuo, Tei-Wei	1906
Kwok Yip, Szeto	335

L

Laakkonen, Jussi	599
Labib, A. Ezzat	261
Lagaisse, Bert	2141
Lago, Daniel	615
Lara Gil, O.	2263
Laranjeiro, Nuno	456, 1711
Lasagni, Matteo	314
Lashgar, Ahmad	1329
Lau, Nuno	295
Laurent, Yoann	1518
Lautamäki, Janne	149
Le Traon, Yves	2271
Le, Hong Anh	1651
Lee, Byunghun	1492
Lee, Byungjeong	1553
Lee, Donghee	2047
Lee, Eunjae	2047
Lee, Gil-Je	169
Lee, Junghoon	2075
Lee, Kyungjun	2069
Lee, Lue-Jane	1906
Lee, Minhó	2001
Leger, Paul	1648
Lehner, Wolfgang	1072
Lehtiniemi, Arto	1270
Lencastre, Maria	1390
Leotta, Maurizio	775
Lesueur, François	2165

Leung, Carson K.	919
Levorato, Mario	1117
Li, Huan	527
Li, YueRan	1512
Limeira de Lima Júnior, Manoel	1541, 1567
Linares Pinto, Pedro	1195
Liu, Changchang	926
Liu, Xiufeng	1015
Llana, Luis	1781
Lo, David	1644
Loff, João	1167
Lommatzsch, Andreas	1039
Longo, Antonella	1219
Lopes, Aparecida M.Z.	214
Lopes, Yona	2212
Lopez, Michael	2119
López-Casado, M.C.	2263
López-Sanz, Marcos	810
Loques, Orlando	464
Loreti, Michele	1840, 1857
Loudcher, Sabine	819
Loulergue, Frédéric	2099
Loureiro, Janaína R.	1184
Lourenço, João M.	1309
Lu, Kejie	527
Lucena, Márcia	1397
Lujak, Marin	327
Luo, Yu	2279

M

Macau, Elbert E.N.	1160
Macedo, Autran	2054
Macedo, Daniel V.	239
Machado, Patrícia D.L.	1534
Maciá, Hermenegilda	1688
Maciel, Paulo	569
Madeira, Daniel	1335
Madeira, Edmundo	615
Magalhães, Jonathas	270
Magel, Kenneth	1526
Maia, José Everardo Bessa	118
Maia, Marcos D.N.	1160
Maini, Parikshit	301
Maity, Soumya	659
Makris, Christos	973, 1238
Malachowsky, Samuel A.	1610
Malecha, Gregory	1504
Malta, Cheops Araujo	227

Malucelli, Andreia	1680
Manhães, Laci Mary Barbosa	247
Manoel, Maurício	1390
Manolopoulos, Yannis	1023
Manzato, Marcelo G.	1060, 1105
Manzer, Ayesha	1586
Marana, Aparecido Nilceu	66
Maranhão, José	662
Marcato, Rafael	26
Marchand, Cedric	1957
Marcheggiani, Diego	1066
Marcos, Esperanza	810
Marinho, Leandro Balby	409
Marques, Arthur	1358, 1364
Marques, Eduardo R.B.	331
Marques-Neto, Humberto T.	1654
Martí, Luis	133, 201
Martin, Nelson	96
Martinello, Magnos	665
Martínez-Torres, Rafael	1781
Martins, Bruno	1167
Martins, Eliane	2299
Martins, Francisco	331
Mascolo, Saverio	609
Massidda, Caterina	307
Masson, Pierre-Alain	1737
Massoni, Tiago	1534
Masuhara, Hidehiko	1962
Mate, Sujeet	1270
Matias, Rivalino	2054
Matl, Lubos	646
Matos, Rubens	569
Matuszyk, Pawel	947
Maureira, E.	2263
Mauro, Jacopo	1861
Mayo, Michael	871
Mayo-García, R.	448
Maza, J.	2263
Mazullo, Felipe	662
Mechaoui, Moulay Driss	509
Meddeb, Aref	1291
Medeiros, Amaury	1498
Medhi, Deep	615
Medina, Jonathas Leontino	157
Mefteh, Mariem	1602
Melo, Erick Lazaro	1285
Mendes, Carlos	1195
Mending, Jan	1225, 1231

Mendonça, Manoel G. de	1472
Mendonca, Nabor C.	1383
Mergel, Germano Duarte	1594
Mestre, Demetrio Gomes	981, 1696
Mikesell, Derek	1154
Mikkonen, Tommi	149
Milewicz, Reed	2107
Min, Byungho	2127
Min, Donghee	2072
Minsam, Kim	335
Mira da Silva, Miguel	1189, 1195
Miyashita, Yamato	806
Moawad, Assaad	2271
Mochalova, Anastasia	1181
Moens, Karel	555
Moerland, Marnix	732
Molina, Jose Manuel	201
Mondal, Anirban	592
Mongiovi, M.	1573
Monniaux, David	1745
Monteiro, André F.	464
Moraes, Regina	1425
Morales, José Miguel	283
Moreira Soares, Daricélio	1541, 1567
Moreira, Adriano	40
Moreira, Alexandra	32
Moreira, Dilvan A.	1417
Moreira, Guilherme	40
Moreira, Leandro A.S.	289
Morelli, Matteo	1940, 1948
Moreno, Marcio Ferreira	1278
Morgan, Graham	143
Moro, Mirella M.	1142
Morvan, Christophe	1834
Mosen, Dominik	708
Mostarda, Michele	368
Motta, Danilo	26
Mouafo, Yves	1047
Moyano, Francisco	1344
Mucci, Matteo	345
Muchaluat-Saade, Débora C.	2212
Mühl, Gero	2007
Mukherjee, Tridib	442, 592, 2305
Müller, Günter	1245
Muñoz, V.F.	2263
Murguzur, Aitor	1641
Murta, Leonardo	1541, 1567
Mykhailova, Mariia	2122

N

Nakagawa, Elisa Y.	1411, 1417, 1433
Nakajima, Shin	1651
Nanopoulos, Alexandros	1181
Naqvi, Nayyab Zia	555
Nascimento, Dimas C.	981, 1696
Nascimento, Márcia V.P. do	59
Navarro, Elena	283
Navaux, Philippe O.A.	2015, 2033, 2066
Nélis, Vincent	1925
Nepomuceno, Thiago Gomes	118
Neto, Baldoino F. dos S.	1457
Neto, Valdemar V.G.	1433
Neufeld, James	740
Neumann, Florentin	708
Neves, António J.R.	295
Nguyen, Thanh	277
Nieminen, Antti	149
Niewenhuijse, Ewout	353
Nikolic, Radina	2231
Ning, Peng	2192
Nöhrer, Alexander	1486
Nonnenmacher, Vinicius	1123
Norberto de Souza, Osmar	54
Nosál', Milan	2115
Nwokeji, Joshua Chibuike	1242, 1249

O

Ogasawara, Angélica	208
Ogasawara, Eduardo	208, 915
Oh, Hyunok	2060
Oh, Yongseok	2047
Oikawa, Shuichi	2021
Ojameruaye, Bendra	1401
Okkalioglu, Murat	901
Oliveira, Marcel	1808
Oliveira, Rui André	1711
Oliveira, Stanley	1105
Oliveira, Toacy C.	1657
Oliveira, Willian D.	994
Omar, Cyrus	1986
Omatu, Sigeru	195
Oosterman, Jasper	747
Oquendo, Flavio	1411, 1417, 1433

P

Pääkkönen, Pekka	2288
Pack, Chulwoo	2252
Paiva, Afonso	26
Paiva, Débora M.B.	157, 1184
Paiva, Ranilson	227, 233, 270
Pakkala, Daniel	2288
Palanca, Javier	189
Palizban, Ali	2231
Paludo, Marco	1680
Palviainen, Jarmo	149
Panagiotis, Georgiadis	1672
Pandey, Ashutosh	428
Papaioannou, Thanasis	602
Papatriantafilou, Marina	2204
Pape, Tobias	1970
Papoulias, N.	1978
Pappalardo, G.	1573
Paraiso, Emerson Cabrera	360
Park, Gyung-Leen	2075
Park, Sanghyun	47
Parzyjegla, Helge	2007
Pauli, Korbinian	2149
Paulino, Hervé	1309
Pedro, Lais Z.	214
Pedrosa, Glauco V.	74, 92
Pellenz, M.E.	673, 716
Pena, Eduardo H.M.	701
Penadés, M. Carmen	261
Pendão, Cristiano	40
Penha, Dulcineia	471
Penna, M.C.	673, 716
Pereira Nunes, Bernardo	254
Pereira, Adriano C.M.	2328
Pereira, José	468
Pérez del Pulgar, C.J.	2263
Perez-Cruz, Fernando	954
Perkusich, Angelo	1498
Perkusich, Mirko	1498
Pesare, Enrica	273
Petric, Ronald	2320
Petrocchi, Marinella	1294
Pianini, Danilo	1846
Piessens, Frank	2171
Pilla, Maurício Lima	2093
Pimentel, João	1397
Pimentel, Maria G.C.	1099, 1105
Pinel-Sauvagnat, Karen	1093

Pinho, Luís Miguel	1925
Pinho, Márcio	267, 825
Pinsard, Thomas	2099
Pinto, José	331
Pires, Carlos Eduardo	409, 981, 1696
Pirkelbauer, Peter	2107
Plastino, Alexandre	1541, 1567
Plattner, Hasso	18
Podgorelec, Vili	110
Polat, Huseyin	901
Poncelet, Clément	1759
Ponte, Nayane	1719
Ponti-Jr, Moacir P.	1257
Porubän, Jaroslav	2115
Posegga, Joachim	2149
Pousa, Adrian	2027
Pouwelse, Johan	2312
Prasetya, W.	1559
Prates, Bruno G.	214
Preguiça, Nuno	1297
Preti Santiago, Gabriel	2328
Preuss, Leonardo	208
Preuveneers, Davy	555, 2185
Prieto, Manuel	96, 1339
Prieto-Matias, Manuel	2027
Primiero, Giuseppe	1370
Proença Jr., Mario L.	701
Pu, Lina	2279
Puffitsch, Wolfgang	1898

Q

Qi, XiaoFang	1512
Qin, Hong	813
Quadros, João	208
Quartel, Dick	1211
Queiroga de Oliveira Filho, Ananias	227
Queiroz, Saulo	634
Quiles, Marcos G.	1160
Quinlan, Daniel	2107
Quiñones, Eduardo	1955

R

Rafailidis, Dimitrios	1023
Rajtmajer, Sarah	1154
Ramakrishnan, Arun	555
Ramalho, Franklin	1358, 1364
Ramos, Gabriel	1335

Rangwala, Huzefa	837
Ranise, Silvio	2177
Raravi, Gurulingesh	1925
Rau-Chaplin, Andrew	125
Razente, Humberto L.	831
Read, Jesse	954
Reddy, A. Goutham	169
Reddy, Y. Raghu	1480
Rêgo, Alex Sandro C.	409
Rego, Paulo A.L.	577
Reinehr, Sheila	1680
Reis, Luís	1315
Reis, Manuel	1167
Rekhis, Slim	621
Relvas, João	32
Rezende, Solange O.	1105
Ribeiro, Leila	1547
Ribeiro, Manuel	331
Ribeiro, Pedro	10
Ricca, Filippo	775
Riccobene, Elvinia	1704
Riedi, Marcelo	673
Riedl-Ehrenleitner, Markus	1486
Rijkse, Rick	761
Rocha, Leonardo	118, 1335
Rocha, Lincoln S.	577
Rocha, Miguel	3
Rodrigues da Silva, Alberto	1854
Rodrigues Jr., Jose F.	1129
Rodrigues, André Valente	879
Rodrigues, Cleyton Mário de O.	376
Rodrigues, Fernando	589
Rodrigues, Joel J.P.C.	680, 701
Rodrigues, Maria Andréia F.	239
Rodríguez-Pascual, M.A.	448
Rogge-Solti, Andreas	1225
Rolim, Tiago	1383
Römer, Kay	314
Rosa, Paulo F.F.	289
Rospocher, Marco	368
Rostirolla, Gustavo	501
Rothenburger, Bernard	423
Rushi, Julian L.	2231
Rubio-Montero, A.J.	448
Rueda, U.	1559
Rueher, Michel	1773
Ruiz, Duncan	54, 102
Ruy, Fabiano B.	388

Rychnovský, Dušan	724
Ryu, Sungtae	2069

S

Sachetto, Rafael	1335
Saez, Juan Carlos	2027
Sagardui, Goiuria	1641
Sakr, Sherif	1203
Sakurai, Kouhei	1962
Salehi, Ebad	1329
Salhi, Yakoub	1874
Salza, Pasquale	1631, 1664
Sampaio, Américo	1383
Sampaio, Augusto	1808
Sampaio, Jonas C.	542
Sánchez, F.M.	2263
Sánchez, Pedro	283
Sanchez-Pi, Nayat	133, 201
Sanoja, Andrés	753
Santos, Iallen	662
Santos, José Amancio M.	1472
Santos, Lucio F.D.	994
Santos, Maribel Yasmina	40
Santos, Renata M.S.	1657
Saraiva, João	175
Sarmento Mendes, Diego	967
Sarmento, Rui	960
Sarro, Federica	1664
Sato, Denise M.V.	505
Sboui, Tarek	1008
Scalabrin, Edson E.	505
Scandurra, Patrizia	1704
Scarparo, Roberta	267
Schapranow, Matthieu-P.	18
Schiel, Ulrich	402
Schlötterer, Jörg	1031, 1108
Schmerl, Bradley	428
Schneider, Jean-Guy	1231
Schoeberl, Martin	1892
Schönherr, Jan H.	2033
Sebastiani, Fabrizio	585, 1053
Seifert, Christin	1031
Sekerinski, Emil	1992
Sena, Demóstenes	1616
Serbedzija, Nikola	1857
Serique, Sabrina	208
Serpa, Ygor R.	239
Serpa, Yvens R.	239

Shahriar, Hossain	791
Shahzad, Abida	2285
Shankar, Anish	1480
Shankar, Natarajan	1504
Sharma, Avinash	2305
Shihab, Emad	1610
Shin, Sung	2252
Shterionov, Dimitar	1887
Shukla, Sandeep K.	1624
Signoles, Julien	1765
Silva, Ana Paula C.	1142
Silva, Andre Almeida	1457
Silva, Fernando	10
Silva, Francisco Airton	569
Silva, Italo	1457, 1661
Silva, João	295, 1309
Silva, João Carlos	175
Silva, Nuno	1189
Silva, Pedro Mário	80
Silva, Thiago H.P.	1142
Silva, Walter J.	831
Silveira, Milene Selbach	1594
Sioutas, Spyros	973
Sioutis, Michael	1874
Siqueira, Sean W.M.	254
Soares, André	662
Soares, Fábio	1350
Soares, João	1297
Soares, Luiz Fernando Gomes	1278
Soares, Monique	1397
Sobral, Andrews	86
Son, Seong H.	2252
Song, Il-Yeol	339
Sorge, Christoph	2320
Sourlas, Vasilis	602
Sousa, João B.	331
Sousa, Pedro	1189
Souza, Carolina	163
Souza, R.D.	673, 716
Souza, Uéverton	208
Spiliopoulou, Myra	947
Spognardi, Angelo	1294
Squicciarini, Anna	1154
Stamelos, Ioannis	1580
Stegagno, Paolo	307
Stocco, Andrea	775
Stocks, P.A.	1637
Stojmenović, Ivan	708

Straccia, Umberto	345
Strobl, J.	2263
Sugawara, Toshiharu	494
Sugiyama, Ayumi	494
Sujit, P.B.	301
Sun, Meisong	688
Sun, Yi	688
Sundermann, Camila V.	1105
Sunyaev, Ali	1722

T

T.V., Prabhakar	1464
Tailliar, Alice	1933
Tajima, Keishi	1174
Takada, Tetsuji	1263
Takano, Yasunao	2079
Takemura, Hikaru	1174
Talbi, Meriam	2165
Talhi, Chamseddine	548
Talpin, Jean Pierre	1624
Tambe, Arjun	277
Tanaka, Atsushi	1174
Tarouco, Liane M.R.	640
Tassiulas, Leandros	602
Teixeira, Cesar A.C.	1285
Teixeira, Diogo	32
Teraoka, Fumio	806
Theodoropoulos, Georgios	416
Thiele, Maik	1072
Thion, Romuald	2165
Thirioux, Xavier	1933
Tian, Yuan	1644
Tiburski, Ramão Tiago	488
Tiezzi, Francesco	1840
Tizzei, Leonardo P.	1441
Toda, Takahisa	1880
Tonella, Paolo	775
Traina Jr., Caetano	994
Traina, Agma J.M.	74, 92, 994
Tramontana, E.	1573, 1797
Trevelin, Luis C.	480
Trias, Feliu	810
Trinta, Fernando	577, 596, 1719
Trois, Celio	665
Trojahn, Tiago H.	1257
Trujillo, Salvador	1641
Truong, Anh	2177
Truong, Ninh Thuan	1651

Tseng, Tai-Lun	798
Tsuda, Koji	1880
Tu, Chia-Heng	798, 2245
Tuck, James	2107
Tudor, Valentin	2204
Turpaud, Vincent	548
Tyler-Jones, Matthew	254
Tzerpos, Vassilios	1586
Tzimas, Giannis	973

U

Uchiyama, Akira	521
Usener, Claus A.	220
Ushaw, Gary	143

V

V, Gayathri	396
Valejo, Alan	1136
Valente, Eduardo	3
Valero, Valentín	1688
Valverde-Rebaza, Jorge	1136
van Bezu, Ronald	761
van der Werf, Jan Martijn E.M.	2198
van Hillegersberg, Jos	1211
Vandic, Damir	353, 732, 761
Vanka, Rajesh	2107
Varadharajan, Vijay	2127
Vardanega, Tullio	1892, 1955
Vasconcelos, Alan Lívio Guedes	1278
Vasconcelos, Cristina N.	80
Vasconcelos, Leandro Guarino de	783
Vassileva, Julita	214
Vecchiato, Daniel	2299
Veith, Alexandre	501
Velcin, Julien	819
Verhagen, Jim	761
Vernadat, François	1751
Viana, Ricardo	1719
Vicente, Marco	1189
Viegas, Felipe	1335
Vieira, Marco	1425, 1711, 2299
Vieira, Vaninha	535
Viel, Caio César	1285
Viganò, Luca	2177
Vigo, Roberto	1840
Vikatos, Pantelis	1238
Vilela, Jéssyka	1397

Villamil, Marta Becker	1123
Vinagre, João	947, 963
Viroli, Mirko	1846
Virote Kassick, Rodrigo	2015
Visser, Joost	1238, 2198
Vorobyov, K.	1637
Vos, T.	1559

W

Wanderley, Fernando	1350
Wanderley, Gregory Moro Puppi	360
Wang, Chenglong	1986
Wang, Haoxu	125
Wang, Pengcheng	2157
Wang, Wei	2252
Ward, Tomas E.	416
Weber, Ingo	1231
Wehrheim, Heike	1729
Weiss, Gereon	471
Weske, Mathias	1225
Wolf, Tilman	2157

X

Xexéo, Geraldo	915
Xia, Xin	1644
Xing, Cong-cong	688, 2257
Xiong, Kaiqi	2192
Xu, Jin	2225
Xuan, Xiao	1644

Y

Yan, Tak	1078
Yang, Geunseok	1553
Yang, Ming-Chang	1906
Yano, Mitsuaki	195
Yao, Jianguo	515
Yeu, Yunku	47
Yoo, Kee-Young	169
Yoo, Shinjae	2225
Yoon, Youngmi	47
Yu, Dantong	813, 2225
Yu, Huafeng	1624
Yu, Xue	2157

Z

Zanon Boito, Francieli	2015
Zappatore, Marco	1219
Zeman, Klaus	1486
Zeng, Mengxi	2257
Zhang, Chongsheng	926
Zhang, Qi	527
Zhang, Tao	1553
Zhao, Yanxiao	2279
Zheng, Yong	929
Zhou, Mingming	1512
Zhu, Shitong	688
Ziccardi, Marco	1892
Zida, Souleymane	857
Zimbrão, Geraldo	247
Zulianello, Marco	1955

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Volume I: Artificial Intelligence & Agents, Distributed Systems, and Information Systems

Track Chairs (Co-Editors)

Theme: Artificial Intelligence & Agents

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Computational Intelligence and Video & Image Analysis (CIVIA)

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Applications of Evolutionary Computing (EC)

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Smart Human Computer Interaction (HCI)

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Intelligent Information Fusion (IIF)

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Intelligent and Interactive Learning Environments (IILE)

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Intelligent Robotics and Multi-Agent Systems (IRMAS)

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Denis Wolf, University of São Paulo, Brazil

The Semantic Web and Its Applications (SWA)

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Theme: Distributed Systems

Dependable and Adaptive Distributed Systems (DADS)

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Cooperative Systems (COSYS)

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Mobile Computing and Applications (MCA)

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Networking (NETS)

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Davide Rossi, University of Bologna, Italy
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Theme: Information Systems

Data Mining (DM)

Hasan Jamil, University of Idaho, United States
Raymond Wong, University of New South Wales, Australia
Stefan Kramer, Johannes Gutenberg University - Mainz, Germany

Data Streams (DS)

Albert Bifet, Yahoo! Research Barcelona, Spain
Shonali Krishnaswamy, Monash University, Australia
João Gama, LIAAD-University Porto, Portugal

Data Theory, Technology, and Applications (DTTA)

Junping Sun, Nova Southeastern University, United States

Ramzi A. Haraty, Lebanese American University, Lebanon

Apostolos Papadopoulos, Aristotle University, Greece

Information Access and Retrieval (IAR)

Gloria Bordogna, CNR, Italy

Gabriella Pasi, Univ. Milano Bicocca, Italy

Social Network and Media Analysis (SONAMA)

Sang-Wook Kim, Hanyang University, Korea

Volume II: Software Development, System Software & Security

Track Chairs (Co-Editors)

Theme: Software Development

Enterprise Engineering (EE)

Artur Caetano, University of Lisbon, Portugal
Marco Montali, Free University of Bozen-Bolzano, Italy
Rafael Accorsi, University of Freiburg, Germany
Ulrich Frank, University of Duisburg-Essen, Germany

Multimedia and Visualization (MMV)

Maria da Graça C. Pimentel, Universidade de São Paulo, Brazil
Takayuki Itoh, Ochanomizu University, Japan
Rudinei Goularte, Universidade de São Paulo, Brazil

Multicore Software Engineering, Performance, Applications, and Tools (MUSEPAT)

Jeremy S. Bradbury, University of Ontario of Technology, Canada
Eitan Farchi, IBM Haifa Research Laboratory, Israel

Requirement Engineering (RE)

Maria Lencastre, Universidade de Pernambuco, Brazil
Joao Araujo, Universidade Nova de Lisboa, Portugal

Software Architecture: Theory, Technology, and Applications (STTA)

Antonio Bucchiarone, Bruno Kessler Foundation of Trento, Italy
Raffaella Mirandola, Politecnico di Milano, Israel
Patrizia Scandurra, University of Bergamo, Italy
Sungwon Kang, Koera Advanced Institute of Science and Technology, Korea

Software Engineering (SE)

Byungjeong Lee, Univesity of Seoul, Korea
Eunjee Song, Baylor University, USA

Service-Oriented Architecture and Programming (SOAP)

Alberto Lluch Lafuente, IMT Lucca, Italy
Marcello Maria Bersani, Polytechnic of Millan, Italy
Alberto Núñez, Universidad Complutense de Madrid, Spain

Software Verification and Testing (SVT)

Gwen Salaun, Univesity of Grenoble Alpes, France
Marielle Stoelinga, University of Twente, The Netherlands

Theme: System Software & Security

Coordination Models, Languages and Applications (CM)

Mirko Viroli, Università di Bologna, Italy
Jose Luis Fernandez-Marquez, Université de Genève, Switzerland
Francesco Tiezzi, IMT Institute for Advanced Studies Lucca, Italy

Constraint Solving and Programming (CSP)

Stefano Bistarelli, Università di Perugia, Italy and IIT-CNR, Pisa, Italy
Eric Monfroy, LINA-Université de Nantes, France
Barry O'Sullivan, University College Cork, Ireland

Embedded Systems (EMBS)

Li-Pin Chang, National Chiao-Tung University, Taiwan
Marco Di Natale, Scuola Superiore S. Anna, Italy

Object Oriented Programming Languages and Systems (OOPS)

Davide Ancona, University of Geneva, Switzerland

Operating Systems (OS)

Bongjae Kim, Seoul National University, Korea
George Hamer, South Dakota State University, USA

Programming Languages (PL)

Marjan Mernik, University of Maribor, Slovenia
Barrett Bryant, University of North Texas, United States

Computer Security (SEC)

Giampaolo Bella, Università di Catania, Italy
Sergio Maffei, Imperial College, UK

Smart Grid and Smart Technologies (SGST)

Gail-Joon Ahn, Arizona State University, USA
Dongwan Shin, New Mexico Tech, USA
Seong-Je Cho, Dankook University, Korea

Software Platforms (SP)

Jinman Jung, Seoul National University, Korea
Jun Huang, Chongqing University of Post & Telecommunications, China

Trust, Reputation, Evidence and other Collaboration Know-How (TRECK)

Jean-Marc Seigneur, University of Geneva, Switzerland

Editorial Message

Special Track on Computational Biology and Bioinformatics (CO-BIO²)

<http://sac2015.usal.es/cobio2/>

*Paola Lecca, Centre for Integrative Biology,
University of Trento, Italy*

*Dan Tulpan, Information and Communication Technologies,
National Research Council, Canada*

*Jouan Manuel Corchado, Department of Computer Science and Automation,
University of Salamanca, Spain*

Goals and focus

The Computational Biology and Bioinformatics (CO-BIO²) Track promotes current advances in analytical methods relying on mathematical, physical, chemical and computational models applied to biological sciences. The track has placed particular emphasis on research topics such as new knowledge inference, data integration, modelling, simulation and analysis in genomics, transcriptomics, proteomics and metabolomics. Original papers presenting novel and efficient computational methodologies tailored to these topics have been solicited, received and carefully reviewed to meet the high-quality standards that the Track and the SAC ACM Symposium has achieved in the past editions.

Statistics

SAC ACM CO-BIO² attracted 23 submissions from 7 countries (Brazil, Germany, Korea, Portugal, The Netherlands, Turkey and United States of America). The acceptance rate was 35%, with 7 manuscript accepted as full papers and 1 manuscript accepted as poster paper.

Description of accepted papers

The accepted papers cover four timely hot research areas in computational biology: gene network inference and topological analysis, functional studies of RNA binding proteins, identification of genetic variants via semantic biology technologies, and transcript-based reannotation of microarray platforms. The track also accepted manuscripts on specific applicative domains from medical analysis and healthcare, such as imaging techniques for high-definition tissue image reconstruction and health management platforms.

Acknowledgments

The SAC ACM CO-BIO² Track organizers like to express their gratitude to the Steering Committee of the SAC ACM 2015, for their responsiveness and guidance with all the logistic and procedural aspects of the Track.

The Track organizers are extremely grateful to the Track Program and Reviewers Committee Members for their professionalism, valuable scientific expertise and outstanding punctuality that ensured the selection of high-quality papers:

Angela Re, Centre for Integrative Biology, University of Trento, Italy.

Chaouki Regoui, Information and Communications Technologies, NRC, Canada.

Chiara Damiani, Department of Informatics, Systems and Communication, Università degli Studi di Milano-Bicocca, Italy.

Cristian Pinzón, Technological University of Panama, Panama.

Daniela Giacomazza, Institute of Biophysics, National Research Council, Italy.

Eleonora Lusito, The FIRC Institute of Molecular Oncology Foundation, The European Institute of Oncology, Italy.

Florentino Fernandez-Riverola, University of Vigo, Spain.

Giuseppe Maulucci, Institute of Physics, University Cattolica del Sacro Cuore - Rome, Italy.

Guylaine Poisson, Department of Information and Computer Sciences, University of Hawaii, USA.

Javier Bajo, Technical University of Madrid, Spain.

Juan F. De Paz, University of Salamanca, Spain.

Kyungim Baek, Department of Information and Computer Sciences, University of Hawaii, USA.

Luis Fernando Castillo, University of Caldas, Colombia.

Luiza Antonie, School of Computer Science, University of Guelph, Canada.

Mahdi Belcaid, Department of Information and Computer Sciences, University of Hawaii, USA.

Michela Lecca, Bruno Kessler Foundation, Center for Information Technology, Italy.

Miguel Angel Mayer, Research Programme on Biomedical Informatics (GRIB), Pompeu Fabra University, Spain.

Miguel Rocha, University of Minho, Portugal.

Mohd Saberi Mohamad, Universiti Teknologi Malaysia, Malaysia.

Pablo Carbonell, Institute of Systems and Synthetic Biology, University of Evry, UniverSud Paris, France.

Paolo Cazzaniga, University of Bergamo, Italy.

Phuong Nguyen, Center for Computational and Systems Biology, University of Trento, Italy.

Robert Beiko, Faculty of Computer Science, Dalhousie University, Canada.

Roberto Montemanni, Dalle Molle Institute for Artificial Intelligence, University of Lugano and SUPSI, Switzerland.

Simona Costantinescu, Computational Biology Group, ETH Zürich, Switzerland.

Tiancheng Li, Northwestern Polytechnical University, China.

Last but not the least the Track chairs would like to thank **Antonio Juan Sánchez Martín** and **Fernando de la Prieta Pintado** for their continuous dedication and support with website setup and editing.

EDITORIAL MESSAGE
**Special Track on the Computational Intelligence
and Video & Image Analysis**

Agostinho Rosa, LaSEEB - ISR – IST, Portugal

Yin-Fu Huang, National Yunlin University of Science and Technology, Taiwan

The special track on the Computational Intelligence and Video & Image Analysis (CIVIA) is a forum for engineers, researchers and practitioners throughout the world to share technical ideas and experiences related to the implementation and applications of Computational Intelligence, to Video & Image Analysis, and even to Systems Biology & BioMedicine. Many conferences have been dedicated to Evolutionary Computing (ICEC, GECCO, PPSN, etc), Video & Image Analysis (ICIAR, ICIAP, ICASSP, IJCAI, etc) and Systems Biology & BioMedical Engineering (ICSB, RECOMB, BME, etc), but they don't offer much on the blending of Computational Logic, Boolean Satisfiability and Soft Computing tools to address practical applications of Image Analysis and Bio Systems Modeling and Simulations. Thus, the research papers involved with applying computational intelligence techniques to video and image analyses would be welcome no matter how theoretical they are, should they have practical applications.

Totally, we have 20 submissions for the CIVIA track. To keep the acceptance rate less than 25% for the regular papers, we only accept 5 oral papers. By the way, 2 poster papers are accepted for the poster section. In summary, including posters, we have 35% (7/20) acceptance rate for the CIVIA track.

The accepted oral or poster papers are involved in different subfields, including image analysis, motion estimation, biometrics, face recognition, image retrieval, horizon tracking, and feature selection. These subfields are all related to the topics or themes of the CIVIA track.

Finally, we would like to thank all reviewers for their efforts in reviewing these papers. These reviewers consist of the program committee members and some professionals. Without their hard work, we could not complete this review process.

EDITORIAL MESSAGE

Special Track on Applications of Evolutionary Computation

Raúl Giráldez Rojo, Pablo de Olavide University, Spain

Beatriz Pontes Balanza, University of Seville, Spain

The “Applications of Evolutionary Computation” (EC) track aims at providing a forum for ideas, research, development activities, and particularly for applications generated by academics and practitioners in evolutionary computing and closely related areas.

The EC Track addresses techniques and applications of Genetic Algorithms, Evolution Strategies, Evolutionary Programming, Genetic Programming, Simulated Annealing, Ant Colony Optimization and other related techniques. Of particular interest are the applications of these techniques to computationally difficult combinatorial problems.

In response to the call for papers, 19 articles were submitted to the EC track. All submissions were peer reviewed by at least three program committee members. The program committee selected two full articles and three poster papers for inclusion in the proceeding. The accepted papers covered a wide range of research topics and novel applications of Evolutionary Computation.

In their paper, Luciano C. Blomberg, Rodrigo C. Barros AND Duncan D. Ruiz propose a novel evolutionary algorithm for regression tree induction, which has embedded in its evolutionary cycle a robust framework for dealing with missing data. Márcio P. Basgalupp, Rodrigo C. Barros and Vili Podgorelec present a multi-objective hyper-heuristic based on evolutionary algorithms that automatically designs complete decision-tree induction algorithms. Thiago Gomes Nepomuceno, José Everardo Bessa Maia and Leonardo Sampaio Rocha propose an approach to the MOGAs initialization problem using an algorithm based on Path Relinking. Haoxu Wang, Omar A. C. Cortes and Andrew Rau-Chaplin study from the perspective of an insurance company the Dynamic Reinsurance Optimization problem in which given a set of expected loss distributions, a model of reinsurance market costs, and some general financial terms, their task is to evolve a set of complex multi-layered reinsurance contracts that define a Pareto frontier quantifying the best available tradeoffs between expected risk and returns for the insurer. Finally, Daniel Cinalli, Luis Martí, Nayat Sanchez-Pi and Ana Cristina Bicharra García review suitable techniques of interactive and preference-based evolutionary multi-objective algorithms to achieve feasible solutions in Pareto-optimal front

The success of this year EC track is due to the hard work and effort of many people. We would like to thank the members of the conference organizing committee for their great support. We thank the members of the Program Committee for their timely evaluation of the submitted papers.

We hope that you enjoy attending the EC track and that you find in its sessions and proceeding a challenging resource for your present and future research work.

EDITORIAL MESSAGE

Special Track on Smart Human Computer Interaction

Anand Paul, Kyungpook National University, Korea

Soon Ki Jung, Kyungpook National University, Korea

*Wenmin Wang, School of Electronic and Computer Engineering
Peking University, China*

1. THE TRACK ON SMART HUMAN COMPUTER INTERACTION

I would like to take this opportunity to feel pleasure to welcome you to 30th Symposium on Applied Computing, Special Track on Smart Human Computer Interaction (SAC 2015-HCI) in Salamanca, Spain. April 13-17, 2015.

The Human Computer Interaction Track carries on this tradition by fostering and carrying out education and multidisciplinary research under the umbrella of human-computer interaction domain. The scope of its work includes designing and testing of new tools, latest findings, technologies and applications in the area of smart of smarthuman-computer interaction. The objective of HCI track is to provide an excellent opportunity to share and exchange ideas in the area of smart human-computer interaction professionals, engineers, academics and industrial people worldwide that supports human activity and organization, and building theory in the field.

In response to the call for papers, for this special track, we received 36 papers worldwide. Each paper was carefully double blind peer reviewed from related field experts/TPC members. For almost every paper, we received at least 3 independent reviews. After this intensive process, we carefully ranked the papers and selected 7 high-quality papers for presentations at this track and later publication in the conference proceedings. Unfortunately, due to limited number of sessions and to keep the acceptance rate below 25% much interesting papers could not be included in the program. The final program covers a wide range of topics of Smart Human-Computer Interaction.

2. ABOUT THE PAPERS

The HCI Track has 1 separate session containing 7 regular paper, as described below. The research project titled "Benchmarking Motion Sensing Devices for Rehabilitative Gaming" introduces the concept of utilizing action videogames in the field of rehabilitation of impaired dexterity. For this purpose, a mechanism is described for a benchmark is introduced for the quantitative assessment of motion capture devices for gaming. A range of devices is considered, in the context of rehabilitative gaming projects, presenting results in the fidelity of motion capture that each provides.

The article titled "Design Framework Enhancing developer Experience in Collaborative Coding Environment" presents a framework for results of utilizing collaborative online coding environment to create new, innovative cloud-based services. In this paper, the authors have collected data from 37 students in two separate coding exercises, each lasting several days. The results show that some experience coders saw no benefits of such system, whereas, in general, participants reported both pragmatic benefits, such as increase in efficiency of coordinating actions and motivation due to perceived presence of team members.

The research paper titled "Evaluation of Web Accessibility in the Maps domain" presents a method for execution of three accessibility evaluations on web-based map applications. Such assessments are based on the expert

reviews, tools, and the end user, were performed, using the WCAG 2.0 guidelines and analyzing its 'Level A' success criteria. The results show that the evaluation performance reaches its level because they do not meet analyzed criteria, according to evaluation performed.

The research article titled "Selfie cafe: Socialization in Public Spaces" proposed an Urban Computing applications for leveraging socialization. The application was deployed in the wild to see how people would react to it in specific places where socialization would be expected but was not happening. The results show that the 'Selfie Café' installation show that it helped setting a more playful mood in the place, an increase in the time spent by people in there as well as supporting interactions among locals, acquaintances, and strangers

The paper titled "An anonymous ID based remote mutual authentication with the main agreement protocol on ECC using smart cards" proposed a security features regarding the secure communication over wireless network. This paper analyzes the Debiao's scheme, and we further put forward an anonymous ID-based remote mutual authentication with the primary agreement protocol on ECC using smart cards. The proposed security-enhanced features incorporate identity protection, anonymity, and secure session-key alongwith the merits of Debiao's scheme.

The paper titled "Design and Implementation of Smart HCI based Android Interface for Blinds " proposed an interface for the blind people needs, braille language and Android platform. The proposed method uses Braille Language forthe blinds for alphanumeric text input. Therefore, Android and braille suggested an interface based on gesture recognition. Such method is operated by movements of figures, e.g., drawing the digit pattern on the screen and voice source's involvement is not there.

The paper titled "Towards a Catalog of Usability Smells" provides a study of a preliminary empirical study with software developers in the context of a real opensource hospital management application. The authors have used a tool that supports the automated analysis of interactive systems, which helps to reason automatically about usability smells. Such tool has been used for automatic extraction of models of GUI behavior from source code. The results show that these models can be used to detect the presence of usability smells.

3. ACKNOWLEDGEMENTS

Without the collaboration and support of many people, this track would not have been possible. The chairman is grateful to everyone who served on the Program Committee, apart from the track chairs there were others involved in reviewing the papers, namely:

Newlin Rajkumar–Anna University India

Aruna Angeline–SNS College of Technology, India

Karthik Subburathinam–SNS College of Technology

Bo-Wei Chen–Princeton University, USA

Pedro Furtado – Universidade de Coimbra, Portugal

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Graham Morgan – Newcastle University

Awais Ahmad – CCMP Labs, Kyungpook National University, Korea

Alfred Daniel – CCMP Labs, Kyungpook National University, Korea

Mazhar Rathore– CCMP Labs, Kyungpook National University, Korea

EDITORIAL MESSAGE

Special Track on Intelligent Information Fusion

Juan M. Corchado, University of Salamanca, Spain

Javier Bajo, Technical University of Madrid, Spain

Research on Intelligent Systems for information fusion has matured during the last years and many effective applications of this technology are now deployed. The problem of Information Fusion has attracted significant attention in the artificial intelligence community, trying to innovate in the techniques used for combining the data and to provide new models for estimations and predictions. The growing advances of Information Fusion as rapid advances in sensor technology that provide context-information has led to new applications in different environments such as remote sensing, surveillance, home care, etc. With the continuing expansion of the domain of interest and the increasing complexity of the collected information, intelligent techniques for fusion processing have become a crucial component in information fusion applications. In this sense, Intelligent systems can improve high level information fusion aimed at supporting decision making, or intelligent information management. This track provides an international forum to present and discuss the latest scientific developments and their effective applications, to assess the impact of the approach, and to facilitate technology transfer. This track provides a framework to present, to discuss, and to disseminate the latest developments and the most important outcomes related to intelligent information fusion. Some of the topics that will be dealt with under the track on Intelligent Information Fusion are:

- Intelligent systems for Information Fusion
- Multi-classifier/Decision Systems
- Multi-Sensor and Multi-Source Fusion System Architectures
- Wireless Sensor Networks
- Context Awareness And Management
- Adaptive Fusion Architectures
- Multiagent systems
- Fusion Learning and Classification algorithms
- Intelligent Techniques For Fusion Processing
- System Design for Information Fusion
- Distributed Computing
- Practical applications in fields as Image Analysis, Robotics, Space, Bio-medical, Transportation, Economics, and Financial Information Systems

Each paper submitted to the Special Track on Intelligent Information Fusion went through a stringent peer review by three members of the international committee composed of 22 internationally renowned researchers from 8 different countries. From the submissions received, 21% were selected for presentation at the conference.

This volume presents the papers that have been accepted for the Special Track on Intelligent Information Fusion in the 2015 edition of SAC. These articles report on the application and validation of Intelligent Systems for Information Fusion, Decision Systems, Multiagent Systems, Distributed Computing, Multi-classifier Systems.

We would like to thank all the contributing authors, the members of the Program Committee, and especially the Organizing Committee for their hard and highly valuable work. Their work has helped to contribute to the success of the track.

EDITORIAL MESSAGE

Special Track on Intelligent, Interactive and Innovative Learning environments

Seiji Isotani, University of São Paulo, Brazil

Ig Ibert Bittencourt, Federal University of Alagoas, Brazil

Emmanuel G. Blanchard, University of Montreal, Canada

Julita Vassileva, University of Saskatchewan, Canada

With the advent of powerful computing technologies, including the World Wide Web (WWW), computer-based learning environments have become more intelligent, flexible, mobile and ubiquitous. Computers, TVs, mobile phones, games, consoles, and other technologies can be transformed into smart learning environments with great potential to help students.

The expectation is that intelligent, interactive and innovative learning environments will eventually enable the realization of **AAAL – Anytime, Anywhere, Anybody Learning**, using most of the WWW resources and collecting inputs from the real world to create better and more personalized learning environments. Such expectation is consistent with that of the advancement of the WWW itself. Such trends facilitate the use of WWW content and resources as knowledge that can be interpreted by computers and learned by people. It is also expected that new technologies will emerge that will enable students with special needs and students in developing countries and rural areas to learn effectively even in the harshest of conditions, making the best use of teachers' and students' time and effort. To achieve AAAL there is a need to find ways to integrate major advances in artificial intelligence, computer vision, data mining, human-computer interaction and other sub-areas of Computer Science with advances in the Learning Sciences and Engineering in order to leverage the development of smart learning environments.

The aim of this track on intelligent, interactive and innovative learning environments is to bring together researchers and practitioners from academia, industry and schools to think together and share their visions of the next generation of educational technologies that will meet students' needs in the 21st century. We are particularly interested in technological advances that can be applied to leverage current learning systems on architectural, technological and philosophical levels.

The topics of interest include, but are not limited to:

- Architectures and frameworks for intelligent learning environments
- Tools and languages to support learning design
- AI in Education (Data mining, distributed systems, intelligent authoring/tutoring systems, etc)
- (Social) Semantic Web technologies and linked data for education
- Intelligent tools for Computer-Supported Collaborative Learning
- User modeling, adaptation and personalization
- Mobile and ubiquitous computing for learning
- Games and Gamification in Education
- Intelligent/interactive learning environments applied to specific domains
- Culturally-aware systems
- MOOCs (Massive Open Online Course)

EDITORIAL MESSAGE

Technical Track on Intelligent Robotics and Multi-Agent Systems

Denis F. Wolf, ICMC – University of São Paulo, Brazil

Rui P. Rocha, ISR – University of Coimbra, Portugal

Christopher D. Kiekintveld, University of Texas at El Paso, TX, USA

Foreword

The technical track on Intelligent Robotics and Multi-Agent Systems (IRMAS) focuses on all aspects of intelligent robotics and multi-agent systems (MAS) including related areas and applications. Its primary goal is to exploit synergies between robotics and artificial intelligence (AI), more precisely between intelligent robotics and MAS, and bring together researchers from both fields. For many years, robotics and AI researchers have worked separately, both fields have matured enormously, and today there is a growing interest in getting the two research fields together. Many in robotics believe that the focus in the near future should be adding capabilities to robots that lie at the core of AI research. Reciprocally, AI researchers aim at embedding their techniques in physical robots that can perceive, reason and act in real, dynamic physical environments. The IRMAS technical is a forum for researchers of the two areas to share experiences, expose issues, and discuss about these exciting fields.

We invited papers to address the research topics covered by this track through a call for papers distributed through worldwide mailing lists on robotics and AI and private mailing lists of the Programm Committee (PC) members. The accepted papers cover important topics of this track, both on intelligent robotics and MAS.

In this edition, there were 32 papers submitted from Europe (17), South America (9), USA (2), Far East (2), Middle East (1), and Africa (1). After a rigorous blind peer review process by 58 PC members, 8 regular papers and 3 poster papers were accepted for the conference, resulting in an overall acceptance rate of 34%.

Acknowledgment

Many people contributed to the success of this track. First of all, we would like to thank to all members of the international PC for their efforts in attracting many quality papers and in providing thoughtful reviews on time. The PC members are listed here in alphabetical order:

Albert Jiang - Univ. of Southern California, USA
Alberto Ruiz - University of Murcia, Spain
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João Sequeira - University of Lisbon, Portugal
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Luis Mejias - Queensland Univ. Techn., Australia
Luis Merino - Pablo de Olavide University, Spain
Luis Paulo Reis - University of Minho, Portugal
Luiz Chaimowicz – Fed. Un. Minas Gerais, Brazil
Luiz Mirisola - Tech. Institute Aeronautics, Brazil
Manish Jain - Virginia Tech, USA
Manuel Silva - Polytechnic of Porto, Portugal
Matthew E. Taylor - Washington St. Univ., USA

Mauro Dragone - Univ. College Dublin, Ireland
Micael S. Couceiro - Univ. of Coimbra, Portugal
Mohan Sridharan - Texas Tech University, USA
Nicola Basilico - University of Milan, Italy
Nicola Gatti - Politecnico di Milano, Italy
Noa Agmon - Bar Ilan University, Israel
Nuno Lau - University of Aveiro, Portugal
Ondrej Vanek - Czech Techn. Univ., Czech Rep.
Paolo Stegagno - Max Planck Institute, Germany
Pedro Núñez - University of Extremadura, Spain
Rainer Kümmerle - KUKA Labs., Germany
Raúl Marín Prades - Universitat Jaume-I, Spain
Sandip Sen - University of Tulsa, USA
Serge Stinckwich - UPMC / IRD, France
Sérgio Monteiro - University of Minho, Portugal
Sílvia Botelho - Federal Univ. Rio Grande, Brazil
Tom Duckett - University of Lincoln, UK
Valdir Grassi Jr. - University of São Paulo, Brazil
Véronique Perdereau - ISIR - UPMC, France
Volkan Isler - University of Minnesota, USA

We also want to thank all the authors who contributed to the SAC 2015 IRMAS track. Finally, we offer special thanks to the SAC 2015 Organizing Committee and the ACM SIGAPP.

About the Track Chairs

Denis F. Wolf is an associate professor at the Institute of Mathematical and Computer Sciences in University of Sao Paulo (ICMC-USP), Brazil. He obtained his Ph.D. degree in Computer Science from the University of Southern California in 2006 and is currently the director of the Mobile Robotics Laboratory at ICMC-USP. Most of his current research focuses on perception, decision-making, and control of autonomous robotic vehicles for urban and agricultural applications.

Rui P. Rocha is an assistant professor at the Department of Electrical and Computer Engineering and a senior researcher at the Artificial Perception for Intelligent Systems and Robotics (AP4ISR) team of the Institute of Systems and Robotics (ISR-UC), at University of Coimbra, Portugal. He obtained the Ph.D. degree in Electrical and Computer Engineering from the Faculty of Engineering of University of Porto, in 2006. His main research area is cooperative mobile robotics and his main research interests are multi-robot systems, human-robot team cooperation, distributed control, cooperative perception, and autonomous robots.

Christopher D. Kiekintveld is an assistant professor in computer science at the University of Texas at El Paso, TX, USA. His research work in the area of artificial intelligence is driven by fundamental questions about how computational analysis techniques can be used to make good decisions in highly complex environments. He has been especially interested in multi-agent systems, which raise questions about how to predict and react to the behavior of other intelligent agents (including humans) in both cooperative and adversarial settings.

EDITORIAL MESSAGE
Special Track on The Semantic Web and Applications

Hyoil Han, Marshall University, USA

Soon Ae Chun, City University of New York, USA

The technical track "The Semantic Web and Applications (SWA)" focuses on the topics related to Semantic Web Technologies and their Applications. The techniques to realize and/or utilize the Semantic Web are discussed in this track.

The focus of this track is to present research concerning issues such as: 1) learning/constructing ontologies for Semantic Web applications; 2) utilizing ontologies for data management, integration and interoperability in Semantic web applications; 3) architectures for achieving Semantic Web goals for specific application domains; and 4) improving search techniques (or engines) with Semantic Web technologies.

This track aims to tackle research problems and practical applications for the Semantic Web. Researchers and practitioners are invited to submit papers on the theoretical, technical and practical issues of Semantic Web and its Applications. We are particularly interested in applying Semantic Web technologies to specific application domains (e.g., e-learning, e-business, social informatics, healthcare informatics, biomedical informatics, and bioinformatics).

The acceptance ratio of this track is 28.5% for regular papers. We have a paper for the poster session. We are grateful to the authors for submitting the papers to the track. In addition, we would like to express our thanks to the program committee for the track.

EDITORIAL MESSAGE

Special Track on Dependable and Adaptive Distributed Systems

Karl M. Goeschka, UAS Technikum Vienna, Austria

Rui Oliveira, Universidade do Minho, Portugal

Peter Pietzuch, Imperial College London, United Kingdom

Giovanni Russello, University of Auckland, New Zealand

Introduction

While computing is provided by the cloud and services increasingly pervade our daily lives, dependability is no longer restricted to mission or safety critical applications, but rather becomes a cornerstone of the information society. Unfortunately, heterogeneous, large-scale, and dynamic software systems that typically run continuously, often tend to become inert, brittle, and vulnerable after a while. The key problem is that the most innovative systems and applications are the ones that also suffer most from a significant decrease in dependability when compared to traditional critical systems, where dependability and security are fairly well understood as complementary concepts and a variety of proven methods and techniques is available today. In accordance with Laprie we call this effect the *dependability gap*, which is widened in front of us between demand and supply of dependability, and we can see this trend further fueled by the demand for resource awareness (including green computing) and increasing cost pressure.

Among technical factors of dependability, *software development* methods, tools, and techniques contribute to dependability, as defects in software products and services may lead to failure and also provide typical access for malicious attacks. In addition, there is a wide variety of *fault tolerance* techniques available, including persistence provided by *databases*, replication, group communication, transaction monitors, reliable *middleware*, *cloud* infrastructures, and trustworthy *service-oriented architectures* with explicit control of quality of service properties. Furthermore, *adaptiveness* is envisaged in order to react to observed, or act upon expected changes of the system itself, the context/environment (e.g., resource variability or failure/threat scenarios) or users' needs and expectations. Provided without explicit user intervention, this is also termed autonomous behavior or self-properties, and often involves monitoring, diagnosis (analysis, interpretation), and reconfiguration (repair). In particular, adaptation is also a means to achieve dependability in a computing infrastructure with dynamically varying structure and properties.

Statistics

This year, we received 26 submissions, from which 5 could be accepted after being reviewed by four to five members of the program committee. The resulting acceptance rate is 19%.

Acknowledgements

We would like to thank our program committee members for their support, their timely reviews and the numerous suggestions for improvements of particular papers.

Overview of the Sessions and Papers

The DADS track provides a forum for scientists and engineers in academia and industry for their latest research findings on selected topics in dependable and adaptive distributed systems. In particular, the following papers comprise this track:

1. **A Taxonomy of Reliable Request-Response Protocols**
Naghmeh Ivaki, Nuno Laranjeiro and Filipe Araujo
2. **Workload characterization model for optimal resource allocation in cloud middleware**
Shruti Kunde and Tridib Mukherjee
3. **Modeling Dependable Systems with Continuous Time Bayesian Networks**
Martin Gröbl
4. **Evaluation of an adaptive framework for resilient executions of high demanding Monte Carlo applications**
Manuel Rodríguez-Pascual, Antonio Juan Rubio-Montero and Rafael Mayo-García
5. **Optimal Planning for Architecture-Based Self-Adaptation Via Model Checking of Stochastic Games**
Javier Camara, David Garlan, Bradley Schmerl and Ashutosh Pandey

In addition, three posters have been accepted:

6. **Scalable Model for Dynamic Configuration and Power Management in Virtualized Heterogeneous Web Clusters**
André F. Monteiro and Orlando Loques
7. **An Experimental Evaluation of Machine-to-Machine Coordination Middleware**
Filipe Campos and José Pereira
8. **Architectural Patterns for Software-based Fail-Operational Behavior of Cyber-Physical Systems**
Dulcineia Penha and Gereon Weiss

EDITORIAL MESSAGE

Special Track on Mobile Computing and Applications

Hong Va Leong, The Hong Kong Polytechnic University, Hong Kong

Alvin T.S. Chan, The Hong Kong Polytechnic University, Hong Kong

1. THE MOBILE COMPUTING AND APPLICATIONS TRACK

Riding on the success of previous Mobile Computing and Applications Tracks spanning from 2003 to 2014 for more than a decade, we are delighted to present the 2015 Mobile Computing and Applications Track again. The track features research papers drawn from a highly diversified spectrum of mobile computing, with application modeling being a rising topic. We have been receiving a good number of submissions throughout the years. According to the nature of the papers collected in this track, the accepted regular papers are organized into two sessions, covering largely the upcoming body network application and context-aware application areas: *Wireless Body Network and Network Performance* and *Mobile Context and Device*. The track is dedicated to draw upon research efforts and expertise from different areas of research, so as to promote better synergy and to bring forth not only core communications protocols for application development and data management, but also important and upcoming research applications to realize the benefits of anywhere, any place and anytime pervasive and ubiquitous computing.

2. THE REVIEW PROCESS

It is to our great honor to have invited many well-established researchers with strong track records in the area of mobile computing and mobile data management to serve on the international program committee. We would like to express our deepest gratitude to the program committee members for their dedication to the high quality review process, within a relatively short review cycle. Each paper is sent to at least three independent reviewers in the program committee, under a blind review process. In the end, all papers received at least three review reports, commenting on their relative merits and shortcomings. Acceptance was based on the scores recommended by the reviewers, their relative level of confidence in the papers, as well as their written comments. We concur that the papers we accept are of high quality and it is indeed unfortunate that many good quality papers could not be included in the proceedings. We would especially like to thank the program committee members and additional reviewers for their dedicated efforts and help in reviewing the papers:

Kemal Akkaya from Southern Illinois University, USA; *Angelo Brayner* from University of Fortaleza, Brazil; *Guadalupe Canahuate* from University of Iowa, USA; *Chi-Yin Chow* from City University of Hong Kong, Hong Kong; *Alfredo Cuzzocrea* from ICAR-CNR and University of Calabria, Italy; *Ling Feng* from Tsinghua University, China; *Takahiro Hara* from Osaka University, Japan; *Charles Hu* from National Central University, Taiwan; *Dik Lee* from Hong Kong University of Science and Technology, Hong Kong; *Guanling Lee* from National Dong Hwa University, Taiwan; *Ken Lee* from Groupon.com, USA; *Wang-Chien Lee* from Pennsylvania State University, USA; *Po-Ruey Lei* from ROC Naval Academy, Taiwan; *Victor Leung* from University of British Columbia, Canada; *Seng Loke* from La Trobe University, Australia; *Stephane Maag* from Institut Telecom SudParis, France; *Dennis McLeod* from University of Southern California, USA; *Xiaofeng Meng* from Renmin University, China; *Weidong Shi* from University of Houston, USA; *Antonio Si* from Nexant Inc, USA; *Savio Tse* from Istanbul University, Turkey; *Ling-Yin Wei* from Academia Sinica, Taiwan; *Man Hon Wong* from Chinese University of Hong Kong, Hong Kong; *Wei Wu* from Institute for Infocomm Research, Singapore; *Jianliang Xu* from Hong Kong Baptist University, Hong Kong; *Mi-Yen Yeh* from Academia Sinica, Taiwan; *Arkady Zaslavsky* from CSIRO, Australia; *Baihua Zheng* from Singapore Management University, Singapore.

In response to the Call-for-Papers, we received 44 valid submissions from 19 different countries, spanning across 5 different continents. There are most submissions from South America, and just one from Africa. Another submission from Africa was redirected to another track. The distribution is as follows: South America (19.5), Europe (10), Asia (9), North America (4.5) and Africa (1). After a rigorous review process, 10 papers are selected for inclusion in the Proceedings, with the lion's share of 3.5 papers from South America, 2.5 papers from Asia, 1.5 papers from Europe and 1.5 papers from North America and a lone submission from Africa. We are faced with a very tough selection process, and the acceptance rate for regular papers is below 23%. Four papers with favorable reviewers' comments that would have been accepted as regular papers in the past can only be accepted as poster papers. Two poster papers come from South America, and the other split between Europe and Asia. This completes the profile of the Mobile Computing and Applications Track for SAC 2015.

3. THE CONTRIBUTED PAPERS

This year, the contributed papers demonstrate a heavy concentration on the applications, mainly body network and context-awareness. There is no paper addressing fundamental issues. We divide the ten regular papers into two sessions. The first session is dedicated primarily to applications with wireless (body) networks while the second session covers mainly context-aware applications in different forms. The poster session comprises of four papers echoing the regular papers, two on the classification of mobile apps and a context-aware tool, and two on the performance of wireless sensor networks, in terms of energy conservation and scalable design respectively.

Session I: Wireless Body Network and Network Performance

The first paper in the track is authored by Takashi Hamatani, Akira Uchiyama and Teruo Higashino, entitled “*Estimating Core Body Temperature Based on Human Thermal Model Using Wearable Sensors*”. The paper proposes a non-invasive way of estimating the body core temperature based on a 2-node human thermal model with off-the-shelf sensors, attaining an accuracy of only 0.07°C for a 60-minute walking. The second paper is entitled “*ubiMonitor: Intelligent Fusion of Body-worn Sensors for Real-time Human Activity Recognition*” by Heba Aly and Mohamed A. Ismail. In this paper, the authors propose to implement a real-time body activity monitor based on off-the-shelf 3D accelerometers, based on a hierarchical activity recognition scheme with post-processing stage to remove falsely detected activities. The next paper entitled “*Integrating Mobile Sensing and Social Network for Personalized Health-Care Application*” is authored by Huan Li, Qi Zhang and Kejie Lu. The paper proposes a mobile-sensing based health recognition and recommendation framework, relying on activity monitoring via smart-phones, inference of health index from activities and diet and health restaurant recommendation from health index. The fourth paper is by Shuxin Cheng, Jianguo Yao and Fei Hu, entitled “*Optimizing Network I/O Performance through Adaptive Hypercall Coalescing in Embedded Virtualization*”. It addresses the problem of network throughput and latency in an embedded virtualized environment under heavy workload by coalescing hypercalls with a software-only solution, shown to improve by 200% under heavy load with only a small penalty under light load. The final paper in the session is entitled “*MpOS: A Multiplatform Offloading System*”, authored by Philipp Costa, Paulo Rego, Lincoln Rocha, Fernando Trinta and Jose Souza. It proposes a framework that supports a method-based offloading technique for applications under different mobile platforms, with discovery and deployment services. Performance evaluation based on Android and Windows phones have been conducted.

Session II: Mobile Context and Device

The first paper in this session “*A Context Simulator as Testing Support for Mobile Apps*” is by Vaninha Vieira, Konstantin Holl and Michael Hassel. It addresses the important issue of verifying and testing context-aware applications through modeling and simulation of context at different levels of abstractions. This is followed by the paper by Francisco Airton Silva, Paulo Maciel, Gileno Filho and Rubens Matos, which is entitled “*A Scheduler for Mobile Cloud Based on Weighted Metrics and Dynamic Context Evaluation*”. The authors present SmartRank, a scheduling framework to perform load partitioning and offloading for mobile applications using cloud computing to improve performance. It was evaluated and benchmarked through a computationally intensive face recognition application benefited from mobile cloud. The third paper is entitled, “*To Cloud or Not to Cloud: A Context-aware Deployment Perspective of Augmented Reality Mobile Applications*” by Nayyab Zia Naqvi, Karel Moens, Arun Kishore Ramakrishnan, Davy Preuveneers, Danny Hughes and Yolande Berbers. The paper examines the resource utilization and performance trade-offs when extending an Augmented Reality application with context-awareness and cloud computing, on the benefits of taking computation to the cloud. The next paper is entitled, “*Determining the Location of Buildings given a Single Picture, Environment Maps and Inaccurate GPS Coordinates*”, by Jonas C. Sampaio, Raphael S. Evangelista and Leandro A. F. Fernandes. The authors present a novel computational process that is capable of identifying the correct geographic coordinates of the place of interest given a single photo image of a target building. The last paper of the track is “*On Device Anomaly Detection for Resource-limited Systems*”, by Maroua Ben Attia, Chamseddine Talhi, Abdelwahab Hamou-Lhadj, Babak Khosravifar, Vincent Turpaud and Mario Couture. It investigates into security attacks targeting Android Smartphone being repackaged as legitimate applications that are injected with malicious activities, studying the performance with several n -gram algorithms.

Poster Session

Four high quality papers have been selected to be presented as posters. The first paper by Giacomo Berardi, et. al. is entitled “*Multi-Store Metadata-based Supervised Mobile App Classification*”, which provides privacy-preserving automatic classification of mobile apps. The next poster paper is by Paulo Artur de Sousa Duarte, et. al., which is entitled “*Towards Context-Aware Behaviour Generation*”, presenting a configuration tool for context-aware mobile applications. The paper “*Using Fractal Clustering to Explore Behavioral Correlation: A New Approach to Reduce Energy Consumption in WSN*” by Fernando Rodrigues, et. al. addresses sensor node clustering based on the behavior of recent historical data. The poster session is concluded by the paper “*Performance Characterization and Scalable Design of Sensing-as-a-Service Platform*” authored by Tridib Mukherjee, et. al. proposes to regulate event notification delay in a Sensing-as-a-Service Platform.

4. THE TRACK CHAIRS

Hong Va Leong received his PhD from the University of California at Santa Barbara, and is currently an associate professor at the Hong Kong Polytechnic University. He is the program co-chairs of several conferences, including IMMCN, HS@I, CIC, and the track chair of SAC 2003 to 2014. He has served on the organizing committees for SIGMOD and VLDB and on the program committees of VLDB, EDBT, ICDCS, MDM, CIKM and many others. He is a reviewer for ACM Transactions on Computer Systems, IEEE Transactions on Parallel and Distributed Systems, on Knowledge and Data Engineering, on Mobile Computing, on Multimedia, and on Computers, Information Systems, and other journals. His research interests are in mobile computing, internet computing, distributed systems, distributed databases, and digital libraries. He is a member of the ACM, IEEE Computer Society and IEEE Communications Society.

Alvin Chan is currently an associate professor at the Hong Kong Polytechnic University. He graduated from the University of New South Wales with a Ph.D. degree in 1995 and was subsequently employed as a Research Scientist by the CSIRO, Australia. From 1997 to 1998, he was employed by the Centre for Wireless Communications, National University of Singapore as a Programme Manager. He is an active consultant and has been providing consultancy services to both local and overseas companies. In 2003, he was awarded the Most Active New Consultant and Highest Overseas Consultancy awards by the university. In addition, he was the recipient of the 2005 Faculty of Engineering’s Teaching award.

EDITORIAL MESSAGE

Special Track on Networking

Mário M. Freire, University of Beira Interior, Portugal

Marília Curado, University of Coimbra, Portugal

Manuela Pereira, University of Beira Interior, Portugal

Teresa Vazão, INESC ID/IST, University of Lisboa, Portugal

On behalf of the Program Committee of the Track on Networking of the 30th Annual ACM Symposium on Applied Computing (ACM SAC 2015), it is our great pleasure to welcome you to the ACM SAC 2015, held from April 13 to April 17, 2015, in Salamanca, Spain. In recent years, significant advances in computer networks, applications and services have been made throughout the world. This track aims to be a forum for scientists, engineers and practitioners, in academia and industry, to share new ideas, experiences and results, and to present their latest findings in different aspects of computer networking.

In response to the call for papers, a total of 36 submissions were received, from which nine were carefully selected for oral presentation in two technical sessions and four were selected as short paper for poster presentation. Each paper was peer reviewed, through a double-blind process, by at least three members of the Program Committee or additional reviewers. The set of papers accepted for this track covers a variety of research topics, which are of current interest, such as Content Placement in Virtual Networks, Power Consumption in Data Centers, Network Servers, Border Surveillance Systems, Information-Centric Networking, Internet of Things and Software-Defined Networks, Multicast messaging for Kademlia, Wireless networks, and HTTP over UDP.

We thank all the authors who submitted valuable papers to this track. We are grateful to the members of the Program Committee and to the additional reviewers. Without their support, the organization of such high-quality track sessions would not have been possible. We are also indebted to many individuals and organizations that made this track happen, namely ACM Special Interest Group on Applied Computing (SIGAPP), University of Salamanca (Spain), Microsoft Research, University of Beira Interior (Portugal), University of Coimbra (Portugal) and University of Lisboa (Portugal). Last but not least, we are grateful to the members of the Organizing Committee for their help in all aspects of the organization of this track.

We hope that you enjoy the ACM Symposium on Applied Computing and, in particular, the Track on Networking, in Salamanca, Spain, if you attend it and that you find it a useful forum for the exchange of ideas, results and recent findings.

EDITORIAL MESSAGE

Special Track on Wireless Communications and Networking

Dongkyun Kim, Kyungpook National University, Korea

Wei Wang, San Diego State University, USA

Introduction:

Research on Wireless communications and networking has been able to reform our lives in multiple ways. The need to communicate anytime anywhere brought us many new wireless and networking technologies that we use today including cellular networks (3G/4G), ad-hoc networks, sensor networks, WiMAX, etc. The invention of these technologies has created a new paradigm of research and developments. In particular, the past decade has seen a significant surge of research activities in wireless communications and networking. While a number of their applications and services have been introduced, the demands for new applications still exist, requiring technical challenges to become bigger every day. Accordingly, a great number of individuals, researchers, academics are emphasizing new novel ideas and improving the performance of existing techniques/methodologies proposed for wireless communications and networking. This special track aims to bring together researchers, academics, individuals working on selected areas of wireless communications and networking to share their new ideas, latest findings and results.

Statistics: Totally 26 research papers were submitted to WCN track. 6 papers were accepted as regular papers making the acceptance ratio 23%. Majority of the papers were peer-reviewed by 3 to 5 external experts internationally.

Description of accepted papers: The accepted papers covered a wide spectrum of cutting-edge research topics in wireless communications and networking. These topics include, but not limited to: wireless cloud infrastructure and applications, vehicle communications, performance evaluation, indoor localization, low power low latency medium access control, and security issues.

Acknowledgment: The track chairs would like to thank the TPC and reviewers for handling review of the papers in this track. This track will not be successful without the diligent contribution and high quality and timely reviews from the reviewers and the TPC.

EDITORIAL MESSAGE

Special Track on Web Technologies

Angelo Di Iorio, University of Bologna, Italy

Davide Rossi, University of Bologna, Italy

Stefano Zacchioli, Université Paris Diderot, France

The World Wide Web is changing. The advent of HTML 5, the increasing importance of AJAX and client-side scripting, the explosion of Web-based Social Networks as well as the advent of the Federated Social Web, the new frontiers of Semantic Web are only some examples of this general trend.

Web applications are progressively evolving into rich and flexible environments where users can easily access documents, publish content, listen to music, watch videos, draw pictures, and play directly via browser. This class of ubiquitous software systems is gaining momentum and fosters the evolution of new ways for people to interact and cooperate. Novel approaches and techniques, new tools and frameworks are needed to address the increasing complexity of these applications.

The Web Technologies track aims at tracking this continuous evolution by bringing together researchers and practitioners, from industry and academia, working on practical and foundational aspects of Web technologies, as well as other technologies that in the Web have found new and unexpected application fields.

The Web Technologies track, started in 2007, reaches this year its 9th edition. This edition has confirmed the interest of both researchers and practitioners in the track topics. 36 paper submissions have been received from countries as diverse as Algeria, Belgium, Brazil, Colombia, Czech Republic, Estonia, Finland, France, Germany, Greece, Italy, Japan, New Zealand, Portugal, South Korea, Spain, Switzerland, Taiwan, the Netherlands and the USA. Submitted papers have been reviewed by a Program Committee of 39 members, granting 3-4 extensive reviews per submission; 10 of the submitted papers have been accepted as full papers (for an acceptance rate of about 28%) whereas 4 have been accepted as posters.

In the opinion of the track chairs these numbers, when put in context, together with the quality of the submissions, mark a success for the 9th edition of the ACM SAC track on Web Technologies.

The quality of the contributions presented in this proceeding is surely due to the talent and inspiration of our authors, but also to the hard work of the members of the program committee that we would hereby like to thank:

Vincent Balat — Université Paris Diderot - Paris 7, France

Laercio Baldochi — Universidade Federal de Itajubá, Brazil

Gioele Barabucci — Università di Bologna, Italy

Marco Brambilla — Politecnico di Milano, Italy
Jian Cao, Shanghai Jiaotong University, China
Hwan-Gue Cho — Pusan National University, South Korea
Chin-Wan Chung — Korea Advanced Institute of Science and Technology, South Korea
Marco Crasso — IBM Research, Argentina
Flávia Delicato — UFRN, Brazil
Enrico Francesconi — ITTIG - CNR, Italy
Flavius Frasincaer — Erasmus University Rotterdam, the Netherlands
Martin Gaedke — Chemnitz University of Technology, Germany
Celso Hirata — Instituto Tecnológico de Aeronautica, Brazil
Irena Holubova (Mlynkova) — Charles University, Czech Republic
Yuh-Jzer Joung — National Taiwan University, Taiwan
Sang-Wook Kim — Hanyang University, South Korea
Jong Kim — Pohang University of Science and Technology (POSTECH), South Korea
In-Young Ko — Korea Advanced Institute of Science and Technology, South Korea
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Francesco Poggi — Università di Bologna, Italy
Stéphane Sire — Oppidoc, France
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Olga Streibel — Freie Universitat Berlin, Germany
Cesar Teixeira — Universidade Federal de São Carlos, Brazil
Elisa Turrini — Università di Bologna, Italy
Manolis Tzagarakis — University of Patras, Greece
Guandong Xu — University of Technology Sydney, Australia

Special thanks also go to the ACM SAC 2015 Conference Chairs and Program Chairs for their support and guidance.

*Davide Rossi
Angelo Di Iorio
Stefano Zacchiroli*

EDITORIAL MESSAGE

Special Track on Data Streams

Pedro Pereira Rodrigues, CINTESIS, University of Porto, Portugal

Albert Bifet, HUAWEI Noah's Ark Lab, Hong Kong

Shonali Krishnaswamy, Monash University, Australia

João Gama, LIAAD - INESC TEC, Portugal

The complexity and volume of Big Data have introduced new challenges for the research community. Several of these are related to the nature of data generation, since most of the data sources produce data continuously. Examples include sensor and wireless networks, radio frequency identification, customer click streams, telephone records, multimedia and scientific data, and sets of retail chain transactions, among others. These sources are called data streams, ordered sequences of instances that can typically be read only once or a small number of times due to its their high speed of flow and continuous nature. Data streams are characterized by being open-ended, and generated by non stationary distributions. Thus, they are increasingly important in the research community, as new algorithms are needed to efficiently process this streaming data, to enable rapid and real-time updated understanding of the data. The goal of this track is to convene researchers who work with data streams, defining models, processing continuous queries, developing sampling, filtering and stream mining methods, machine learning, and visualization techniques and related issues.

This year, we received 14 submissions from 11 different countries: Italy, Germany, Brazil, Portugal, USA, China, Turkey, Greece, Belgium, France and Japan. After a rigorous review process, where each paper was reviewed by at least 3 PC members, only 4 papers were accepted as full papers, giving the track an acceptance rate of 28%. The papers cover topics such as recommender systems, social networks, adaptive ensemble classifiers, and deep learning.

We would like to thank the Program Committee, who was comprised of several experts from the field: *Annalisa Appice*, Università degli Studi di Bari, Italy, *Albert Bifet*, Huawei Noah's Ark Lab, Hong Kong, *Christian Bockermann*, University Dortmund, Germany, *José del Campo-Ávila*, Universidad de Málaga, Spain, *André Carvalho*, University of Sao Paulo (USP), Brazil, *Raja Chiky*, ISEP, France, *Carlo Combi*, University of Verona, Italy, *Alfredo Cuzzocrea*, ICAR-CNR and University of Calabria, Italy, *Carlos Ferreira*, University of Porto, Portugal, *Mohamed Gaber*, Tasmanian ICT Centre, Australia, *João Gama*, University of Porto, Portugal, *Ricard Gavaldà*, Universitat Politècnica de Catalunya, Spain, *João Gomes*, Institute for Infocomm Research, Singapore, *Geoff Holmes*, University of Waikato, New Zealand, *Elena Ikonomovska*, Josef Stefan Institute, Slovenia, *Petr Kosina*, University of Porto, Portugal, *Shonali Krishnaswamy*, Monash University, Australia, *Cyril Labbe*, University Grenoble, France, *Mark Last*, Ben Gurion University, Israel, *Byung Suk Lee*, University Vermont, US, *Florent Masegla*, INRIA, France, *Rodrigo Mello*, University of Sao Paulo, Brazil, *Rosa Meo*, University of Torino, Italy, *João Moreira*, University of Porto, Portugal, *Irene Ntoutsis*, LMU Munich, Germany, *Marcia Oliveira*, University of Porto, Portugal, *Mykola Pechenizkiy*, Eindhoven University of Technology, The Netherlands, *Pedro Rodrigues*, University of Porto, Portugal, *Josep Roure*, Universitat Politècnica de Catalunya, Spain, *Elaine Sousa*, University of Sao Paulo, Brasil,

Eduardo Spinosa, Federal University of Parana, Brazil, *Philip Yu*, University of Illinois at Chicago, US, and *Indrė Žliobaitė*, Aalto University, Finland

We wish also to thank all the authors, and the Program Chairs of SAC 2015 for making this a successful meeting point for researchers interested in data streams.

EDITORIAL MESSAGE

Special Track on Database Theory, Technology, and Applications

Ramzi A. Haraty, Lebanese American University, Lebanon

Apostolos N. Papadopoulos, Aristotle University, Greece

Junping Sun, Nova Southeastern University, USA

Welcome to the 30th ACM Symposium on Applied Computing Special Track on Database Theory, Technology, and Applications!

Computerized data management technology has been experienced great advancement and evolution since 1950s. Today, high volume data are everywhere from business to IT industry, from government to social organizations, from web search engine to social network, from wired telecommunication network to wireless network, etc. The data is so pervasive, so it is hard to image how these huge volume data will be preserved and processed without advanced data management technology. Every database application requires sophisticated techniques, based on fundamental database theory. So the forum of DTTA track serves the purpose to create the rich synergy and platform to share the advancement of database theory and technology in various applications.

This year we have a collection of 32 high quality submissions contributing to DTTA track and these submissions are from Asia, Australia, Europe, North America, and South America. These excellent submissions are ranged from SQL to NoSQL databases, from traditional database to XML and social network, from traditional database query processing to spatial and temporal query processing, from hot data identification to information leak analysis, from traditional database applications to pervasive and embedded applications, etc. Due to too many high quality submissions, this made the review process harder to accept/reject decision. We have done our best to try accepting more excellent papers, but we regret to leave out some high quality paper due to the limited acceptance rate. Each paper was sent out to at least three reviewers. With the permission of ACM SAC'2015 Organization Committee and PC Chairs, the DTTA track accepted 9 regular papers (28%).

Here we would like to extend our sincere thanks to the reviewers and the PC members for their great support and contribution. Without their help, it is impossible to have the review process completed successfully. We would like to thank all the authors for their quality submissions to contribute DTTA track. We would like to take this opportunity to thank again the colleagues who worked hard to make ACM SAC 2015 possible. We look forward to your participation and cooperation in the upcoming ACM SAC 2016.

EDITORIAL MESSAGE

Special Track on Social Network and Media Analysis (SONAMA)

Sang-Wook Kim, Hanyang University, Korea

With the advent of social network services such as Twitter, Facebook, Tumbler, and Google+, the research on social network and media analysis has been greatly advanced. In recent years, the interactions among people, sharing of knowledge and experiences, community activities in social network services increase greatly, which would make the research on social networks more important. Furthermore, as social media contents within social network services are rapidly being produced and consumed, the social media contents now account for the majority of content published on the world wide web. Social media is differentiated from traditional media in many aspects such as its frequency, quality, usability, immediacy, and permanence, which leads to significant potential to the social media analysis research.

The ACM SAC has been an important venue for the past twenty-nine years, attracting computer scientists, computer engineers, software engineers, and application developers in the world. The Social Network and Media Analysis (SONAMA) track of ACM SAC will provide a forum that brings together researchers and practitioners for exploring technologies, issues, experiences, and applications with a specific focus on the recent research trends and industrial needs in the related fields. Since social network and media analysis encompasses a variety of highly cross-disciplinary research issues, the SONAMA will foster collaborations and exchange of ideas and experiences among researchers working in various fields such as computer science, linguistics, statistics, sociology, geography, economics, and business.

This year, the second of the SONAMA track, we received a total of 45 submissions of high-quality papers from all over the world. The review process was very competitive with each paper receiving at least three reviews. We accepted 10 papers for oral presentations and 2 papers for poster presentations. We would like to thank all the authors who submitted their inspiring contributions to our track. Also, we sincerely appreciate our program committee members listed below who devoted their invaluable time and efforts for reviewing the submissions. Without their help, our track program could not be made so successful. Finally, we would like to give special thanks to program co-chairs Jiman Hong and Alessio Bechini for their nice guidance and support. We look forward to seeing all of you in Salamanca, Spain.

Program Committee Members

Ladjel Bellatreche	National Engin. School for Mechanics and Aerotechnics, France
Polo Chau	Georgia Tech, USA
Freddy Chong-Tat Chua	Singapore Management University, Singapore
Robson L. F. Cordeiro	University of São Paulo, Brazil
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Xiangliang Zhang	King Abdullah University of Science and Tech., Saudi Arabia
Ming Zhou	Microsoft Research Asia, China

EDITORIAL MESSAGE

Special Track on Multimedia and Visualization

Takayuki Itoh, Ochanomizu University, Japan

Maria da Graça C. Pimentel, Universidade de São Paulo, Brazil

Rudinei Goularte, Universidade de São Paulo, Brazil

In the ACM Symposium of Applied Computing, the Multimedia and Visualization (MMV) track is concerned with principles, tools and processes that improve our ability to understand, create, manage, visualize and maintain multimedia in general and in interactive media in particular. The aim of this track is to bring together researchers from academia and industry who are actively engaged both in theoretical and practical aspects of these multidisciplinary themes. Further information on this year's track is available at <http://acmsac.icmc.usp.br/mmv15>.

The Multimedia and Visualization track's scope is deliberately quite broad. Submissions were encouraged whose research addressed any combination of issues in multimedia, visualization and interaction. For ACM SAC'2015, the Multimedia and Visualization track received a total of 22 submissions. After the review of each paper by at least three reviewers from the program committee, 6 submissions were accepted as full papers with oral presentation and 2 were accepted for poster presentation. The accepted works cover many topics within the track's scope, ranging from video summarization using features detection to representation method for video shots based on visual features to a visualization technique for anomalous network communication detection to a novel multi-camera video viewing experience from a single video to an efficient approach for controlling the focus and input events in multimedia applications to a novel method for controlling synchronous remote instances of a multimedia presentation.

We thank all authors for submitting their papers, and all members of the program committee for providing valuable reviews.

Authors of the all papers presented at the conference will be invited to submit extended versions of their work to a special issue of the Multimedia Tools and Applications Journal.

EDITORIAL MESSAGE

Special Track on Multicore Software Engineering, Performance, Applications, and Tools (MUSEPAT)

Jeremy S. Bradbury, University of Ontario Institute of Technology, Canada

Eitan Farchi, IBM Haifa Research Laboratory

João Lourenço, Universidade Nova de Lisboa, Portugal

It is our great pleasure to welcome you to the first SAC track on Multicore Software Engineering, Performance, Applications, and Tools! The SAC-MUSEPAT track aims to address development challenges in multicore parallel systems by bringing together software engineering researchers, applied computer scientists, computer engineers and application developers. The multicore challenges covered in the SAC-MUSEPAT track include specification, design, programming models, programming techniques, testing, analysis, debugging and applications. Furthermore, the track addresses parallelism in a broad range of contexts: multicore CPUs, manycore GPUs, cluster computing, distributed systems, mobile devices, client-server systems and desktops.

This year we had 19 excellent submissions and after a thorough peer review process we were able to accept 6 submissions as regular conference papers (a 31% acceptance rate). We are really excited about the resulting program, which is both broad and multi-faceted. Topics covered include air craft trajectory conflicts, fluid animation, energy efficiency as well as fundamental multicore research topics.

We thank the devoted SAC-MUSEPAT program committee for their review work as well as Victor Pankratius, MIT, for their contributions to the creation of the SAC-MUSEPAT track.

EDITORIAL MESSAGE
Special Track on Requirements Engineering
Maria Lencastre, Universidade de Pernambuco, Brazil
João Araújo, Universidade Nova de Lisboa, Portugal

1. INTRODUCTION

Requirement Engineering (RE) is the branch of Software Engineering concerned with the real-world goals for, functions of, and constraints on software systems; it is also concerned with the relationship of these factors to precise specifications of software behaviour and to their evolution over time and across software families. RE is increasingly recognized as a critically important activity in any systems engineering process. Independently of the nature of the software, the elicitation, analysis, negotiation, specification, validation and management of requirements are fundamental for the development of quality in complex software. Only by fully understanding stakeholders' needs, and documenting them in a concise, and unambiguous way, can consistently deliver quality products designed to meet the complexities of our advanced information society.

The objective of this track is to explore different advances in RE, its relation with different areas, reducing the gap between software engineering solutions and the way one specific domain of knowledge was seen up to a given point.

2. CONTENTS OF THE TRACK

The Requirements Engineering track of ACM-SAC 2015 received 30 (thirty) submissions from 15 (fifteen) different countries, spread over the America, Asia and Europe. A board of 34 specialists reviewed all submissions and selected 8 (eight) papers and 2 (two) posters, covering different areas of the field.

The paper “*An Approach to Early Evaluation of Informational Privacy Requirements*” come from University of London (UK). This paper recasts an existing Ontological Theory of Informational Privacy in terms of modelling constructs; then it applies the theory in the form of a Bayesian network of beliefs in the context of an existing research project.

The paper “*Engineering Trust and Reputation based Security Controls for Future Internet of Things*”, whose authors are colleagues from Germany and Spain, contributes with a methodology and tool to help elicit trust relationships, to reason about how to construct trust and reputation engines for these, and also to specify consequent security controls.

The paper entitled “*A Multi-Criteria Approach for Assessing Cloud Deployment Options Based on Non-Functional Requirements*”, from UNIFOR (Ceará, Brazil), presents an approach that relies on non-functional requirements as key drivers for assessing and selecting, based on a multi-criteria optimization method, the best architectural options for deploying applications in the cloud. Results come from a real application deployed in a popular cloud provider.

The universities of UFRN (Brazil) and Université de Bretagne-Sud (France) contribute with the paper “*Dynamic Decision-Making based on NFR for Managing Software Variability and Configuration Selection*”. This paper presents a dynamic decision-making infrastructure to

support both NFRs representation and monitoring, and to reason about the degree of satisfaction of NFRs during runtime.

Regarding innovations and services, the paper entitled “*Experiences with Service Design Tools for Visualising and Prototyping Innovations*”, comes from Aalto University (Finland). This paper examines the usage of 14 service design tools in terms of how they visualised and prototyped the service concept, as well as how the design process and interaction of these tools enabled the development of the service concept throughout a specific multidisciplinary service design project.

A paper, which deals with voice, comes from UNL (Portugal). It is entitled “*VoiceToModel: An Approach to Generate Requirements Models from Speech Recognition Mechanisms*”, and proposes a framework to improve the accessibility of the requirements process by integrating a requirements engineer or stakeholder with disabilities during requirements modelling.

Considering the theme traceability, two papers from UFCG (Brazil) were accepted. The first one is entitled “*Towards a Requirements Traceability Process Centered on the Traceability Model*”, which proposes and details a RT process; to evaluate the proposed process, an empirical experiment was conducted in a real project. The second one, entitled “*TRL – A Traceability Representation Language*” proposes a language, which provides abstractions to requirements, artefacts and trace links as well as queries, through which trace links can be searched, retrieved and filtered; the authors also have conducted an empirical experiment comparing TRL with other traceability languages.

Two posters accepted in the Requirements Engineering track have different themes in RE, but both consider goal models. From University of Birmingham (UK) comes the poster “*A Risk - Aware Framework for Compliance Goal-Obstacle Analysis*”, which presents a goal-oriented quantitative compliance analysis framework that aims at reducing problems related to incomplete requirements and wrong estimation during the requirement analysis phase. The second poster, entitled “*Deriving the behavior of context-sensitive systems from contextual goal models*” comes from UFPE (Brazil) together with UFRN (Brazil); it proposes a systematic process to derive the behavior of context-sensitive systems from contextual goal models considering the impact of non-functional requirements.

3. ACKNOWLEDGEMENTS

Thanks to the authors who have submitted their works to the RE-Track; they have been a major contributor to the success of this track in SAC 2015 conference. Our gratitude goes to the program committee who works hard reviewing and discussing the papers. We extend our thanks to the SAC 2015 general organization for bringing together an excellent Technical Program and organization.

EDITORIAL MESSAGE

Special Track on

Software Architecture: Theory, Technology, and Applications (SA-TTA)

Antonio Bucchiarone, SOA Research Unit at BKFOF Trento, Italy

Raffaella Mirandola, DEIB - Politecnico di Milano, Italy

Sungwon Kang, KAIST, Daejeon, Korea

Patrizia Scandurra, DIGIP, University of Bergamo, Italy

Introduction

It is our great pleasure to welcome you to the Third Edition of the track *Software Architecture: Theory, Technology, and Applications (SA-TTA 2015)* as part of the 30th ACM/SIGAPP Symposium on Applied Computing (SAC).

The goal of the track SA-TTA is to bring together researchers, practitioners and educators having the common objective of transforming *Software Architecture* into a mature discipline leveraging on both solid scientific foundations and validated engineering methodologies and tools. The main focus of SA-TTA is in *Applied Software Architecture*, namely a special emphasis is put on practical engineering concerns, experiences in tools development, and software architecture case studies. SA-TTA is focused broadly on how to address functional requirements and quality characteristics in the design, maintenance, and adaptation and evolution of software architectures through the support of automated techniques and tools. Of special interest are architecture description languages, formalisms, techniques, methodologies, tools, and runtime environments that support these activities, possibly exploiting model-driven engineering principles. A special emphasis is put also on technical aspects of software architectures development for specific class of software systems and application domains.

We are confident that you will find the program stimulating and that it will provide you with many new ideas and insights. Welcome to the historic city of Salamanca, and many thanks for your participation!

Statistics

The call for papers attracted research paper submissions from Europe, Asia, Brazil, Africa, and USA. Totally, we had 32 high quality papers. According to a strict acceptance rate of 25%, the program committees accepted 8 full research papers and 2 contributions as posters.

Description of accepted papers

Altogether there are interdisciplinary research contributions covering a variety of topics related to: software architectures for Systems of Systems (SoS), multi-scale modeling approaches for large software architectures, ontology-based software architecture descriptions, quality attributes measurement, and software architecture case studies in the SOA and Cloud domains.

Acknowledgments

We thank all authors who wrote articles for this track helping us to make it a success. We also thank the program committee members for their evaluations and critiques of manuscripts:

- Yamine Ait-Ameur - IRIT/ENSEEIH, France
- ChangSup Keum - ETRI, Korea
- José Javier Merseguer - University of Saragoza, Spain
- Mehmet Aksit - Univ. of Twente, The Netherlands
- Oliver Barais - INRIA, France
- Luciano Baresi - Politecnico di Milano, Italy
- Antonia Bertolino - Italian National Research Council - CNR, Italy
- Georg Buchgeher - SCCH GmbH Hagenberg, Austria
- Rafael Capilla - Rey Juan Carlos University, Madrid, Spain
- Giovanna Dimarzo Sereguendo – Univ. of Geneva, Switzerland
- Naranker Dulay - Imperial College London, UK
- Claudia Ermel - TU of Berlin, Germany
- Stefania Gnesi - ISTI-CNR, Pisa, Italy
- Eva Kühn - Vienna University of Technology, Austria
- Chan-gun Lee - Chung-Ang University, Korea
- Jihyun Lee - Daejeon University, Korea
- Antonia Lopes - University of Lisbon, Portugal
- Hernan Melgratti - University of Buenos Aires, Argentina
- Henry Muccini - University of L'Aquila, Italy
- Ileana Ober - University of Toulouse, France
- Flávio Oquendo – IRISA, University of South Brittany, France
- Hongyu Pei-Breivold - ABB Corporate Research, Västerås, Sweden
- Diego Perez-Palacin - Politecnico di Milano, Italy
- Fiona Polack - University of York, UK
- Pasqualina Potena - University of Alcalá, Spain
- Elvinia Riccobene - University of Milan, Italy
- Antonino Sabetta - SAP Research, France
- Lionel Seinturier - Univ. Lille & IUF - LIFL & Inria ADAM
- Romina Spalazzese - Malmö University, Sweden
- Marten van Sinderen - University of Twente, The Netherlands
- Danny Weyns - University of Linnaeus, Sweden
- Tao Yue - Simula Labs, OSLO, Norway

EDITORIAL MESSAGE
Special Track on Software Engineering
Byungjeong Lee, University of Seoul, Seoul, Korea
Eunjee Song, Baylor University, Waco, USA

A special track on Software Engineering (SE Track) aims to be a forum for scientists, engineers and practitioners, in academia and industry to share new ideas, experiences and results, and to present their latest findings in any aspects of Software Engineering. SE Track emphasizes the design, implementation, management and applications of Software Engineering.

The Call for Papers for SE Track attracted 104 final paper submissions from 30 different countries. The submitted papers underwent the blind review process and 25 papers were finally accepted as full papers for inclusion in the Conference Proceedings and presentation during the Symposium. The final acceptance rate for SE Track is 24%. In addition to the accepted full papers, 11 papers that received high enough review scores were accepted as short papers for the Poster Program. The Student Research Competition (SRC) program is designed to provide graduate students the opportunity to meet and exchange ideas with researchers and practitioners. Finally 1 paper was accepted for the SRC program in SE Track.

This year SE Track is divided into five sessions: related presentations in Software Framework, Design Patterns, Metrics and Measurement, Maintenance, Open-Source Projects and Management, V&V, Testing, Formal Methods, Aspect-Oriented Software Development, and Software Product Lines will be associated to one session, so as to promote sharing and discussion of ideas through the whole audience of a topic. Please check the program schedule for details.

On behalf of the entire SAC 2015 Organizing Committee, we congratulate all the authors for having their papers accepted in SE Track. We are grateful to the members of the Program Committee and to the additional reviewers. Without their support, the organization of such high-quality track sessions would not be possible. We also wish to convey our special thanks to the SAC 2015 symposium's main organizers, especially Program Chairs, Alessio Bechini and Jiman Hong, for their continuous help and advice and Local Arrangement Chairs, Javier Bajo and Fernando De la Prieta, for their invaluable support.

Last but not least, we thank you for attending the conference on behalf of the Software Engineering Track and hope that you enjoy the program we have prepared for you.

EDITORIAL MESSAGE

Special Track on Service-Oriented Architectures and Programming (SOAP)

Marcello M. Bersani, Politecnico di Milano, Italy

Alberto Lluch Lafuente, Technical University of Denmark, Denmark

Alberto Núñez, Universidad Complutense de Madrid, Spain

This is the seventh edition of the Service-Oriented Architecture and Programming (SOAP) track. Service-Oriented Programming (SOP) is quickly changing our vision of software development, bringing a paradigmatic shift in the methodologies followed by programmers when designing and implementing distributed systems. SOP originally triggered a radical transformation of the Web, from being a means of presenting information to a wide spectrum of people to becoming a computational fabric. In particular, SOAP encourages works and discussions about what SOP still needs in order to achieve its original goal.

SOAP 2015 solicited submissions on the following topics:

- Formal methods for Service-Oriented Computing
- Notations, models, and standards for Service-Oriented Computing
- Tools and Middlewares for Service-Oriented Development
- Service-Oriented Programming Languages
- Service Choreographies and Protocol-Driven Service Development
- Service Interfaces and Communication Technologies (e.g., REST)
- Microservices and Scalable Service-Oriented Computing
- Engineering methodologies and Patterns for Service-Oriented Software
- Static Analysis and Testing of Service-Oriented applications
- Adaptability, Dependability, and Fault handling in Service Systems
- Security in Service-Oriented Architectures
- Quality of Service and Performance Analysis
- Industrial deployment of tools and methodologies, case studies
- Service application case studies
- Trust and Services
- Sustainability and Services, Green Computing
- Cloud Computing and Services
- Services and Big Data

As we do every year, we have renewed our PC with some new members in the attempt to keep it fresh and active. The PC of SOAP 2015 was formed by:

- Laura Bocchi (Imperial College London, UK)
- Rubén Casado Tejedor (Treelogic, Spain)
- Mauro Caporuscio (Linnaeus University, Sweden)
- Ana Cavalli (Institut Mines-Telecom/Telecom SudParis, France)

- Michele Ciavotta (Politecnico di Milano, Italy)
- Javier Cubo (University of Málaga, Spain)
- Søren Debois (ITU Copenhagen, Denmark)
- Nicola Dragoni (Technical University of Denmark, Denmark)
- Rosa Filgueira Vicente (University of Edinburgh, UK)
- Silvio Ghilardi (Università degli studi di Milano, Italy)
- Claudio Guidi (italianaSoftware, Italy)
- Manuel Mazzara (Innopolis University, Russia and ETH Zurich, Switzerland)
- Hernán Melgratti (University of Buenos Aires, Argentina)
- Fabrizio Montesi (University of Southern Denmark, Denmark)
- Manuel Núñez (University Complutense of Madrid, Spain)
- Durica Nikolić (ETH Zurich, Switzerland)
- Nuno Oliveira (Universidade do Minho, Portugal)
- Kévin Ottens (Klarälvdalens Datakonsult AB, Sweden)
- César Sánchez (IMDEA Software Institute, Spain)
- Daniel Sykes (Imperial College London, UK)
- Valentín Valero Ruiz (University Castilla-La Mancha, Spain)
- Peter Wong (Fredhopper - Amsterdam, Netherlands)
- Franz Wotawa (Graz University of Technology, Austria)
- Ilsun You (Korean Bible University, Korea)
- Fatiha Zaidi (Université Paris-Sud XI, France)

Our call for papers has yet again received a great response, also thanks to our new effort put into its dissemination. We have reviewed 24 submissions. Each submission was reviewed by at least three PC members. All papers were subject to a general discussion and the PC selected only the following six papers for presentation at the conference:

- A hybrid framework for WS-BPEL scenario execution adaptation, using monitoring and feedback data. Dionisis Margaris, Costas Vassilakis and Panagiotis Georgiadis.
- A Software Process Line for Service-Oriented Applications. Cleiton Garcia, Marco Paludo, Andrea Malucelli and Sheila Reinehr.
- Model-Checking Verification of Publish-Subscribe Architectures in Web Service Contexts. Gregorio Díaz, Maria Emilia Cambroner, Hermenegilda Macia and Valentín Valero.
- A Data Quality-aware Cloud Service based on Metaheuristic and Machine Learning Provisioning Algorithms. Dimas C. Nascimento, Carlos Eduardo Pires and Demetrio Gomes Mestre.
- Formal modeling self-adaptive service-oriented applications. Elvinia Riccobene and Patrizia Scandurra.
- Characterizing the Performance of Web Service Frameworks under Security Attacks. Rui Oliveira, Nuno Laranjeiro and Marco Vieira.

We would like to thank the PC members and external referees, for their detailed reports and the stimulating discussions during the review phase; the authors of submitted papers, the session chairs, and the attendees, for contributing to the success of the event; the providers of the START system, which was used to manage the submissions; and the organizers of SAC 2015 for their invitation to organize the track and all the support.

Thank you!

EDITORIAL MESSAGE

Special Track on Coordination Models, Languages and Applications

Mirko Viroli, Alma Mater Studiorum - Università di Bologna, Italy
José Luis Fernandez Márquez, Université de Genève, Switzerland

Over the last decade, we have witnessed the emergence of models, formalisms and mechanisms to describe concurrent and distributed computations and systems based on the concept of coordination. The purpose of a coordination model is to enable the integration of a number of possibly heterogeneous components (processes, objects, agents, services) in such a way that the resulting ensemble can execute as a whole, forming a distributed software system with desired characteristics and functionalities. This is done in terms of coordination abstractions, languages, algorithms, mechanisms, and middleware specifically focused on the management of component interaction. The Special Track on Coordination Models, Languages and Applications crosscuts a number of contemporary software engineering approaches and fields, which we aim to cross-fertilize and bring contribution to, including in particular: multi-agent systems, self-adaptive and self-organizing systems, service-oriented architectures, component-based systems, and all related middleware platforms. We welcomed papers on practical systems or novel applications that are aimed at reaching coordination between components and services, especially if those systems and novel applications challenge existing ideas and models.

FULL PAPERS

Here we present the four full papers accepted:

- Eric Badouel, loic Helouet, Christophe Morvan and Georges-Edouard Kouamou. **A Grammatical Approach to Data-centric Case Management in a Distributed Collaborative Environment.**
- Rocco De Nicola, Yehia Abd Alrahman, Francesco Tiezzi, Michele Loreti and Roberto Vigo. **A Calculus for Attribute-based Communication.**
- Anders Fongen. **Data-Centric Authorization and Integrity Control in a Linda Tuplespace.**
- Danilo Pianini, Mirko Viroli and Jacob Beal. **Protelis: Practical Aggregate Programming.**

POSTERS

These are the two accepted posters to be presented at the Poster Session:

- Dhaminda Abeywickrama, Nikola Serbedzija and Michele Loreti. **Monitoring and Visualizing Adaptation of Autonomic Systems at Runtime.**
- Luís de Sousa and Alberto Rodrigues da Silva. **A Domain Specific Language for Spatial Simulation Scenarios: Presentation Supported by Case Studies.**

ACKNOWLEDGMENT

The co-chairs of this track would like to thank the authors of all submitted papers, without whom it would not be possible to organize this programme. Also, we acknowledge the hard work of the Program Committee, which reviewed the papers, participated in the Program Committee meeting and discussions, and ultimately formed the programme. Finally, we are grateful to the Organization Committee of ACM SAC 2015, for giving us the ground for promoting the Coordination field at ACM SAC.

EDITORIAL MESSAGE

Special Track on Embedded Systems

Marco Di Natale, Scuola Superiore S. Anna, Italy

Li-Pin Chang, National Chiao-Tung University, Taiwan

Introduction

A wide variety of applications, from consumer electronics to biomedical systems, automotive and avionics controls, and industrial plant automation require the development of complex, performance sensitive and reliable embedded functionality. Embedded systems require a tight coupling of hardware and software components with advanced analysis and synthesis techniques. Moreover, the market pressure calls for new methodologies that shorten the development time while taking into account a wide variety of constraints: performance, code size, power consumption, timeliness, maintainability, security and possibly scalability. Solutions can be proposed at different levels of abstraction, making use of an assortment of tools and methodologies: researchers and practitioners from industry and academia contribute with new ideas and experiments.

The focus of this track is on the application of novel and established techniques to the development of embedded systems. Solutions typically emerge from a merger of traditional domains (e.g. computer architecture, OS, compilers, security, software engineering, simulation). The track benefits also from direct experiences in the design and development of embedded devices in traditional and novel application areas, to highlight challenges and solutions in the system design/development process. Researchers and practitioners from academia and industry get a chance to keep in touch with problems, open issues and future directions in the field of development of dedicated applications for embedded systems.

Statistics

The embedded systems track received 36 submissions with the following geographical distribution. 14 papers were from Asia, 13 from Europe, 8 from South America and 1 from North America. 9 papers were selected to be part of the final program, with an acceptance ratio of 25% that confirms the very selective nature of the conference. Two more submissions were selected to be part of the poster program

Track Program

The technical program for the Embedded Systems track includes papers that cover research topics on several architecture layers and process stages.

Cache memory and Flash storage designs are addressed with emphasis on optimized energy management and safety.

Real-time systems and timing analysis play an important role, with contributions discussing innovative operating systems architectures for time composability and code-level analysis for the evaluation of the worst case execution times. Also, the analysis of multi-DAG task models for the representation of conditional executions are discussed.

Finally, design issues, design-level analysis and automatic code generation are the topics addressed by program contributions that highlight the importance of contract-based development and platform-aware simulation-based analysis of functionality in the development of embedded systems.

Acknowledgement

We would like to thank all the people that helped build the technical program and provided support for the track organization. We are especially grateful to all reviewers, who put their valuable time in providing the evaluation and the technical comments for all the submitted papers (with four reviews for most submissions) ,and helped select a stimulating program on a wide range of topics.

Also, we are grateful to the General Chairs, the Poster Chair and the Web Chairs for their support and coordination efforts.

We are sure the program will be of extreme interest to all researchers and practitioners and provide for fruitful discussion and future developments.

EDITORIAL MESSAGE

Special Track on Operating Systems (OS)

Bongjae Kim, Korea Electronics Technology Institute, Korea

George Hamer, South Dakota State University, USA

The purpose of Operating Systems track is to bring together researchers, designers, and developers who are interested in methodologies for the design and analysis of operating systems and/or applications that are highly adaptive to user needs. In recent years, we have noticed a tremendous growth on the demands for highly-efficient operating systems in various fields. At the same time, adaptive applications have also become more and more complex, and it imposes new challenging issues never faced before in this application field. It is thus clear that nowadays the development and design of operating systems must rely, even more than in the recent past, on specific solutions both in the hardware and in the software components. Moreover, the needs to timely tackle changes in the market pushes toward the employment of methodologies to shorten the development time and to drive the evolution of existing products. The solutions to new problems emerging in this setting call for a joint effort from the academics and industry.

The designs of high-performance operating systems and adaptive applications must take into account a wide variety of constraints: Performance, code size, real-time performance, maintainability, energy efficiency, and scalability. This track provides a forum for the presentation of high-quality, original research covering all aspects of operating systems and adaptive applications design, analysis, implementation, evaluation, and case-studies. Solutions might be proposed at different levels of abstractions, making use of an assortment of tools and methodologies. Researchers and practitioners would have a chance to propose new ideas and to compare experimentations. The focus of this track is on the application of both novel and well-known techniques to the operating systems and adaptive applications development.

In this year, a total of 39 submissions were received around the world. Each paper was reviewed by more than 3 blind reviewers and provided careful and thoughtful reviews on which the selection process was based. The reviewing process was done by the technical program committee and additional reviewers. Over the 39 submissions, 10 papers were accepted as full papers, and 4 paper was accepted as poster papers after a rigorous reviewing process. Many excellent papers could not be accepted because of the conference policy in this year.

We would like to thank all of the authors who contributed to the ACM SAC 2015 OS Track. We also like to thank all of the reviewers for their hard and on-time work. Finally, we give special thanks to the SAC organizing committee, who believes in the potential of the OS Track, as well as to the ACM SigAPP.

EDITORIAL MESSAGE

Special Track on Programming Languages

Marjan Mernik, University of Maribor, Slovenia

Barrett R. Bryant, University of North Texas, USA

1. Objectives of the track

The Programming Languages (PL) Track provides researchers and practitioners with a forum to present their ideas and experience in designing new programming concepts and implementing programming languages. It includes the topics of Compiling Techniques, Domain-Specific Languages, Formal Semantics and Syntax, Garbage Collection, Language Design and Implementation, Languages for Modeling, Model-Driven Development and Model Transformation, New Programming Language Ideas and Concepts, New Programming Paradigms, Practical Experiences with Programming Languages, Program Analysis and Verification, Program Generation and Transformation, Programming Languages from All Paradigms (Agent-Oriented, Aspect-Oriented, Functional, Logic, Object-Oriented, etc.), and Visual Programming Languages.

2. Statistical information

Twenty-eight papers were originally submitted from twelve different countries: Belgium, Brazil, Czech Republic, Finland, France, Italy, Japan, Portugal, Slovakia, Spain, Sweden, and the USA. Among those, five regular papers were selected for an acceptance rate of 17.8% as well as three posters. The Track Program Committee had 21 members: Vasco Amaral (Universidade Nova de Lisboa, Portugal), Roberto da Silva Bigonha (Universidade Federal de Minas Gerais, Brazil), Judith Bishop (Microsoft Research, USA), Johan Fabry (University of Chile, Chile), Sebastian Guenter (Senacor Technologies AG, Germany), Christian Hammer (Saarland University, Germany), Nigel Horspool (University of Victoria, Canada), Zoltán Horváth (Eötvös Loránd University, Hungary), Hiroshi Inoue (IBM Research, Japan), Jan Janousek (Czech Technical University, Czech Republic), Geylani Kardas (Ege University, Turkey), Hakjoo Oh (Seoul National University, Korea), Nikolaos Papaspyrou (National Technical University of Athens, Greece), Marco Patrignani (University of Leuven, Belgium), Peter Pirkelbauer (University of Alabama at Birmingham, USA), Enrico Pontelli (New Mexico State University, USA), Komondoor Raghavan (Indian Institute of Science, Bangalore, India), Ulrik Pagh Schultz (University of Southern Denmark, Denmark), Boštjan Slivnik (University of Ljubljana, Slovenia), Jingling Xue (University of New South Wales, Australia), and Kenny Q. Zhu (Shanghai Jiao Tong University, China).

3. The contributed papers

Full papers:

1. *Yasunao Takano and Hideya Iwasaki. Think Recycling for Lazy Functional Languages: Operational Semantics and Correctness.* The paper presents the formal issue of think recycling using a small-step operational semantics and bisimulation.

2. *Rodrigo Medeiros Duarte, André Rauber Du Bois, Maurício Lima Pilla and Gerson Geraldo Cavalheiro. Composable Memory Transactions with Eager Version Management.* The paper describes the lazy implementation of STM that is an extension of Haskell with a set of primitives for writing composable memory transactions.
3. *Frédéric Dabrowski, Frédéric Loulergue, Thomas Pinsard. Nested Atomic Sections with Thread Escape: Compilation.* The paper describes the design of an imperative language LUFJ (Lock Unlock Fork Join) that allows threads and locks manipulations.
4. *Reed Milewicz, Rajesh Vanka, James Tuck, Daniel Quinlan and Peter Pirkelbauer. Runtime Checking C Programs.* The paper presents RTC, a runtime monitoring tool built on top of the ROSE compiler infrastructure that instruments unsafe C code and monitors the program execution.
5. *Irene Córdoba and Juan de Lara. A Modelling Language for the Effective Design of Java Annotations.* The paper describes a domain-specific modelling language to make explicit the rich conceptual model, which lies behind a set of Java annotations.

Posters:

1. *Michael Lopez and Gabriel Dos Reis. Meta-programming with Well-typed Code Analysis.* The paper presents code pattern types, types that reason about the structure of programs through pattern matching and supports type safe code analysis.
2. *Michaela Bačiková, Jaroslav Porubän, Sergej Chodarev and Milan Nosál. Bootstrapping DSLs from User Interfaces.* The paper presents an extraction of the domain model from GUI, which is then transformed to a grammar specification.
3. *Sergii Dymchenko and Mariia Mykhailova. Declaratively Solving Tricky Google Code Jam Problems with Prolog-based ECLiPSe CLP system.* The paper presents several examples of solving the Google Code Jam programming contest with constraint logic programming and linear (integer) programming.

Acknowledgements

We would like to thank all authors for their valuable contributions. We also thank the program committee members who voluntarily supported us to recruit good papers and review the papers.

EDITORIAL MESSAGE

2015 Special Track on Computer Security

Giampaolo Bella, Università di Catania, Italy

Sergio Maffeis, Imperial College London, UK

As chairs of the Computer Security track, we are pleased to welcome you to its fourteenth edition at the ACM Symposium on Applied Computing. The Program Committee for this track, as in past years, is composed of eminent representatives from both industry and academia. Here is the list of members of this year's committee, in alphabetical order:

- Karthikeyan Bhargavan (INRIA, France)
- Cormac Callanan (Aconite Internet Solutions, Ireland)
- Lorenzo Cavallaro (Royal Holloway University of London, UK)
- David W Chadwick (University of Kent, UK)
- Lieven Desmet (KU Leuven, Belgium)
- Dieter Gollmann (TU Hamburg, Germany)
- Pekka Jappinen (Lappeenranta University of Technology, Finland)
- Martin Johns (SAP Research, Germany)
- Sokratis K Katsikas (University of Piraeus, Greece)
- Matteo Maffei (Saarland University, Germany)
- Marius Minea (Politehnica University of Timisoara, Romania)
- Chris Mitchell (Royal Holloway University of London, UK)
- David Nowak (CNRS & Lille 1 University, France)
- Olivier Pereira (Universite catholique de Louvain, Belgium)
- Kenneth Radke (Queensland University of Technology, Australia)
- Andrei Sabelfeld (Chalmers University of Technology, Sweden)
- Hossain Shahriar (Kennesaw State University, USA)
- Haya Shulman (TU Darmstadt, Germany)
- Stefano Zanero (Politecnico di Milano, Italy)

This year we received 56 submissions, as usual from virtually everywhere in the world. The review process, which also involved a number of qualified delegates, was double-blind in the sense that the paper authors were kept anonymous from the reviewers. Each paper received at least 3 reviews, and all papers and reviews were discussed in depth by the assigned reviewers, while the entire Program Committee could monitor the debate and step in at will. We were pleased to observe the continuously improving support that the START submission management tool offered to the debate. As a result of this scientifically thrilling process, papers were marked either for acceptance or for rejection. In the end, only 10 papers were accepted, defining a selective acceptance rate just below 18%. We are therefore confident of the high quality of the published material, and remain indebted to the reviewers for their thorough work.

Here is this edition's programme:

- Min and Varadharajan demonstrate an anti-virus parasitic malware that can bypass the surveillance exercised by a number of deployed anti-virus systems. The malware will then continue to impose its load in stealthy mode, leaving the anti-virus happy that nothing wrong is going on.
- Kerschbaum perfects a technique for outsourced computation by making it oblivious. The servers working collaboratively towards oblivious outsourcing will be unaware of their respective roles, thus effectively reducing their opportunity to collude and exchange information that the client intended to keep confidential.

- Decat et al. introduce the Amusa middleware to support multi-tenant software-as-a-service applications. All tenants as well as the provider gain support through their respective declarations of access rules, and Amusa will then combine and enforce them at run-time without significant performance overhead.
- Braun et al. implement the LogSec browser extension, enabling the browser to enforce enhanced security policies. Depending on the authentication status of the user, LogSec will mitigate a number of browser-based vulnerabilities, such as session hijacking and sidejacking.
- Wang et al. describe their CryptoPaper system to secure the sensitive contents of physical documents. CryptoPaper insists on encrypting sensitive information and printing it out on paper in the form of two-dimensional QR codes. A dedicated scanner system will then ensure that only authorised personnel can retrieve the cleartext.
- Thion et al. introduce a tuple-based access control model motivated by personal information management in a federation of personal databases. Policy enforcement proceeds from having the data owner's dissemination policies linked with atomic data and then suitably combined when data are merged.
- De Ryck et al. tackle the problem of web session security by means of the SecSess mechanism. It addresses common session management vulnerabilities by ensuring a session remains under control of the parties that established it. A proof-of-concept implementation exhibits only minor performance overhead.
- Ranise et al. show how to simplify temporal role-based access control models in such a way that they are amenable to automatic security analysis through a tool executed on a computer. In particular, they propose three possible simplifications and compare their outcomes in terms of efficiency of the automated analysis.
- Preuveneers and Joosen present a dynamic authentication system called SmartAuth. It authenticates the user periodically to maintain confidence in their identity. This is achieved by means of dynamic context fingerprinting and a consent-driven use of context information.
- Xiong and Ning improve state estimation in power grids by means of innovative algorithms. These tolerate malicious sensor readings thanks to the intrinsic relationship among state variables and sensor measurements. The algorithms are assessed both in terms of theoretical analysis and of simulation.

About the track chairs

Giampaolo Bella is Associate Professor at the University of Catania, doing teaching and research in Computer Security and Formal Methods. He has chaired the Computer Security track at ACM SAC since its inception. He has recently been working on formal approaches to studying biological problems as well as socio-technical privacy issues. After his Ph.D. from Cambridge University, he was a research associate at TU Munich, Cambridge University, and a senior researcher at SAP Research France.

Sergio Maffei is a lecturer in Computer Security at Imperial College London. His research straddles web security, formal methods, and programming languages. Recent contributions include automated testing of browser security policies, defensive cryptography in the browser, security analysis of social sing-on and encrypted cloud storage, and defining formal, executable semantics for JavaScript and PHP. Maffei received his PhD from Imperial and has been a visiting researcher at INRIA, Stanford, UCSC, and Microsoft Research.

EDITORIAL MESSAGE

Special Track on Software Platform

Jinman Jung, Hannam University, Korea

Jun Huang, Chongqing University of Posts and Telecom, China

The software platforms are in a constant state of change with new devices and technologies introduced almost every day. As a result, software platform developers and researchers continue to evolve software technologies that are used for increasing mobile conversions and enhancing relationships among users. The structure of software systems involves working with a wide variety of software platforms and technologies range from embedded devices and smart-phones on the low end, to enterprise and distributed systems on the high end. Many research questions remain open from limited battery to remote access control, interaction with external devices, assurance in quality of service, context-aware adaptation to the environment, interface modeling or other issues (security and privacy problems) that are obstacles to thrive software platform technologies. This track aims to share research results and experiences in Software Platforms field with researchers and developers, the track addresses all of these research issues related to software platforms.

This track has received 30 submissions from different countries around the world. Each paper has underwent a blind review process by three members of the track Technical Program Committee (TPC), and 7 regular full papers (with acceptance ratio 23.3%) and 4 regular posters have been accepted for publications in the proceedings of the conference. The selected papers covers a wide spectrum of topics including: mobile social gaming platform, shared data objects, cyber-aided diagnosis systems, service delivery platform, heterogeneous telescope system, sensor data privacy protection system, and wireless regional area system.

The regular papers accepted by this track include: “**A Scalable Platform for Mobile Social Gaming**” by Federico Bergenti, Giovanni Caire and Danilo Gotta, “**The Deployment of Shared Data Objects Among Handheld and Wearable Devices**” by Sheng-Wei Cheng, Che-Wei Chang, Yuan-Hao Chang, Pi-Cheng Hsiu and Chia-Heng Tu, “**Study of Wireless Mammography Image Transmission Impacts on Robust Cyber-Aided Diagnosis Systems**” by Samaneh Aminikhanghahi, Sung Shin, Wei Wang, Soon I. Jeon, Seong H. Son and Chulwoo Pack, “**Performance Analysis for A Service Delivery Platform in Software Defined Network**” by Qiang Duan, Mengxi Zeng, Jun Huang and Cong-cong Xing, “**GISch: A novel scheduler for a heterogeneous telescope network**” by M.C. Lopez-Casado, C.J. Perez-del-Pulgar, Juan Cabello, V.F. Muñoz, Oscar Lara Gil, A.J. Castro-Tirado, Jan Strobl, Eduardo Maureira, Jose Maza, Sergey Karpov and F.M. Sanchez, “**Adaptive Blurring of Sensor Data for balancing Privacy and Utility for Ubiquitous Services**” by Assaad Moawad, Thomas Hartmann, François Fouquet, Jacques Klein and Yves Le Traon, and “**Fairness-oriented Resource Optimization for WRAN Self-coexistence**” by MD Nashid Anjum, Yanxiao Zhao, Yu Luo and Lina Pu. In addition, four posters have been accepted by this track, they are “**Application-Level Task Execution Issues in Mobile Cloud Computing**” by Abida Shahzad, Hyunho Ji, Pankoo Kim, Hanil Hanil, Hanil Ko and Jiman Hong, “**The implications of disk-based RAID and virtualization for write-intensive services**” by Pekka Pääkkönen and Daniel Pakkala, “**ThingStore: A Platform for Internet-of-Things Application Development and Deployment**” by Kutalmis Akpınar, Kien Hua and Kai Li, and “**Object Type Graphs and Object Subtyping**” by Cong-cong Xing.

The ACM SAC 2014 Software Platform track was chaired by Drs. Jinman Jung, and Jun Huang, who wish to thank all the TPC members for their valuable time and technical input for running such an excellent track.

Without their support and contributions, this track would not be successful. The special thanks will be given to the Drs. Sung Shin and Jiman Hong for their leadership and superb work to organize the SAC conference. Finally, the track chairs would like to thank all the authors who contributed to this track.

December 2014,

Dr. Jinman Jung

Dr. Jun Huang

Track Chairs, Software Platform