

# 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.

---

---

## ***Theme: AI and Agents***

### **BIO - Bioinformatics Track**

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

#### **Track Editorial** ..... 1

#### **An Insight into Biological Data Mining based on Rarity and Correlation as Constraints** ..... 3

Souad Bouasker, *University of Tunis ElManar, Tunisia*  
Sadok Ben Yahia, *Tallinn University of Technology, Estonia*  
Gayo Diallo, *University of Bordeaux, France*

#### **Drug Target Discovery using Knowledge Graph Embeddings** ..... 11

Sameh K. Mohamed, *National University of Ireland Galway, Ireland*  
Aayah Nounu, *University of Bristol, UK*  
Vit Nováček, *National University of Ireland Galway, Ireland*

#### **Ensemble Feature Selectin for Biomarker Discovery in Mass Spectrometry-based Metabolomics** ..... 19

AliAsghar ShahrjooiHaghighi, *University of Louisville, USA*  
Hichem Frigui, *University of Louisville, USA*  
Xiang Zhang, *University of Louisville, USA*  
Xiaoli Wei, *University of Louisville, USA*  
Biyun Shi, *University of Louisville, USA*  
Craig J. McClain, *University of Louisville, USA*

#### **Molecule Specific Normalization for Protein and Metabolite Biomarker Discovery** ..... 25

Ameni Trabelsi, *University of Louisville, USA*  
Biyun Shi, *University of Louisville, USA*  
Xiaoli Wei, *University of Louisville, USA*  
Hichem Frigui, *University of Louisville, USA*  
Xiang Zhang, *University of Louisville, USA*  
Craig McClain, *University of Louisville, USA*  
Aliasghar Shahrjooihaghighi, *University of Louisville, USA*

## ***Theme: Software Design and Development***

### **BPMEA - Business Process Management & Enterprise Architecture Track**

**Track Co-Chairs:** Marco Brambilla, *Politecnico di Milano, Italy*  
Davide Rossi, *University of Bologna, Italy*

#### **A Hybrid Reliability Metric for SLA Predictive Monitoring** ..... 32

Marco Comuzzi, *Ulsan National Institute of Science and Technology, South Korea*  
Alfonso E. Marquez-Chamorro, *Universidad de Sevilla, Spain*  
Manuel Resinas, *Universidad de Sevilla, Spain*

<b>Controllability of Business Processes with Temporal Variables</b> .....	40
<i>Johann Eder, Alpen-Adria-Universität Klagenfurt, Austria</i>	
<i>Marco Franceschetti, Alpen-Adria-Universität Klagenfurt, Austria</i>	
<i>Julius Köpke, Alpen-Adria-Universität Klagenfurt, Austria</i>	
<b>Object-Centric Behavioral Constraint Models: A Hybrid Model for Behavioral and Data Perspectives</b> .....	48
<i>Guangming Li, Eindhoven University of Technology, The Netherlands</i>	
<i>Renata Medeiros de Carvalho, Eindhoven University of Technology, The Netherlands</i>	
<i>Wil M.P. van der Aalst, RWTH Aachen University, Germany</i>	
<b>Optimizing Customer Journey using Process Mining and Sequence-Aware Recommendation</b> .....	57
<i>Alessandro Terragni, Eindhoven University of Technology, The Netherlands</i>	
<i>Marwan Hassani, Eindhoven University of Technology, The Netherlands</i>	
<b>Static Analysis of BPMN-Based Process-Driven Applications</b> .....	66
<i>Konrad Schneid, Münster University of Applied Sciences, Germany</i>	
<i>Claus A. Usener, viadee Unternehmensberatung AG, Germany</i>	
<i>Sebastian Thöne, Münster University of Applied Sciences, Germany</i>	
<i>Herbert Kuchen, University of Münster, Germany</i>	
<i>Christian Tophinke, Münster University of Applied Sciences, Germany</i>	
<b>Towards a Metamodel for Supporting Decisions in Knowledge-Intensive Processes</b> .....	75
<i>Sheila Katherine Venero, University of Campinas, Brazil</i>	
<i>Julio Cesar dos Reis, University of Campinas, Brazil</i>	
<i>Leonardo Montecchi, University of Campinas, Brazil</i>	
<i>Cecilia Mary Fischer Rubira, University of Campinas, Brazil</i>	
<b>VIEW: An Incremental Approach to Verify Evolving Workflows</b> .....	85
<i>Mohammad Javad Amiri, University of California, Santa Barbara, USA</i>	
<i>Divyakant Agrawal, University of California, Santa Barbara, USA</i>	
<b>Poster Papers</b>	
<b>Configuring SQL-based Process Mining for Performance and Storage Optimisation</b> .....	94
<i>Stefan Schöning, University of Bayreuth, Germany</i>	
<i>Claudio Di Ciccio, Vienna University of Economics and Business, Austria</i>	
<i>Jan Mendling, Vienna University of Economics and Business, Austria</i>	
<b>Formal Support of Process Chain Networks using Model-driven Engineering and Petri nets</b> .....	98
<i>Elena Gómez-Martínez, Universidad Autónoma de Madrid, Spain</i>	
<i>Francisco Pérez-Blanco, Universidad Rey Juan Carlos, Spain</i>	
<i>Juan de Lara, Universidad Autonoma de Madrid, Spain</i>	
<i>Juan Manuel Vara, Universidad Rey Juan Carlos, Spain</i>	
<i>Esperanza Marcos, Universidad Rey Juan Carlos, Spain</i>	
<b>On the Elicitation and Annotation of Business Activities based on Emails</b> .....	101
<i>Diana Jlailaty, Paris Dauphine University, France</i>	
<i>Daniela Grigori, Paris Dauphine University, France</i>	
<i>Khalid Belhajjame, Paris Dauphine University, France</i>	

**Theme: Distributed Systems**

**CC - Cloud Computing Track**

**Track Co-Chairs:** Priya Chandran, NIT Calicut, India  
SD Madhu Kumar, NIT Calicut, India

**Track Editorial** ..... 104

**A Programming Model and Middleware for High Throughput Serverless Computing Applications** ..... 106

Alfonso Pérez, Universitat Politècnica de València, Spain  
Germán Moltó, Universitat Politècnica de València, Spain  
Miguel Caballer, Universitat Politècnica de València, Spain  
Amanda Calatrava, Universitat Politècnica de València, Spain

**Minimizing Financial Cost of Scientific Workflows under Deadline Constraints in Multi-Cloud Environments** ..... 114

Tianyu Gao, Northwest University, China  
Chase Q. Wu, New Jersey Institute of Technology, USA  
Aiqin Hou, Northwest University, China  
Yongqiang Wang, Northwest University, China  
Ruxia Li, Northwest University, China  
Mingrui Xu, Northwest University, China

**Modelling Multi Level Consistency in Erasure Code based Storage Systems** ..... 122

Ojus Thomas Lee, College of Engineering Kidangoor, India  
Vijay Sharma, National Institute of Technology Calicut, India  
S. D Madhu Kumar, National Institute of Technology Calicut, India  
Priya Chandran, National Institute of Technology Calicut, India

**Oversubscribing Micro-Clouds with Energy-aware Containers Scheduling** ..... 130

Sérgio Mendes, Universidade de Lisboa, Portugal  
José Simão, Instituto Superior de Engenharia de Lisboa, Portugal  
Luís Veiga, Instituto Superior Técnico, Portugal

**Secure Container Orchestration in the Cloud: Policies and Implementation** ..... 138

Gabriel P. Fernandez, Technische Universität Dresden, Germany  
Andrey Brito, Universidade Federal de Campina Grande, Brazil

**The Lord of the Shares: Combining Attribute-Based Encryption and Searchable Encryption for Flexible Data Sharing** ..... 146

Antonis Michalas, Tampere University of Technology, Finland

**Poster Papers**

**Performance Overhead of Container Orchestration Frameworks for Management of Multi-Tenant Database Deployments** ..... 156

Eddy Truyen, KU Leuven, Belgium  
Dimitri Van Landuyt, KU Leuven, Belgium  
Bert Lagaisse, KU Leuven, Belgium  
Wouter Joosen, KU Leuven, Belgium

<b>Diabetes Care in Cloud – Research Challenges</b> .....	160
<i>Merlin George, National Institute of Technology, India</i>	
<i>Anu Mary Chacko, National Institute of Technology, India</i>	
<i>Sudeep Koshy Kurien, Malabar Institute of Medical Science, India</i>	
<i>Naseer Ali, Malabar Institute of Medical Science, India</i>	

**Theme: Distributed Systems**

**CCNIV - Communication, Computing and Networking in Internet of Vehicles Track**

**Track Co-Chairs:**     *Imen Jemili, University of Carthage, Tunisia*  
                               *Mohamed Mosbah, Bordeaux INP, France*

<b>Track Editorial</b> .....	163
------------------------------	-----

<b>An Application-Oriented Evaluation of LTE-V's Mode 4 for V2V Communication</b> .....	165
<i>Philip Wendland, Technische Universität Ilmenau, Germany</i>	
<i>Guenter Schaefer, Technische Universität Ilmenau, Germany</i>	
<i>Reiner Thomä, Technische Universität Ilmenau, Germany</i>	

<b>Secure Over-the-air Firmware Updating for Automotive Electronic Control Units</b> .....	174
<i>Dimitris Bakoyiannis, Technological Educational Institute of Crete, Greece</i>	
<i>Othon Tomoutzoglou, Technological Educational Institute of Crete, Greece</i>	
<i>George Kornaros, Technological Educational Institute of Crete, Greece</i>	

<b>Using Machine Learning for Handover Optimization in Vehicular Fog Computing</b> .....	182
<i>Salman Memon, McGill University, Canada</i>	
<i>Muthucumar Maheswaran, McGill University, Canada</i>	

**Poster Papers**

<b>Exploiting Automated Planning for Efficient Centralized Vehicle Routing and Mitigating Congestion in Urban Road Networks</b> .....	191
<i>Lukáš Chrpá, Charles University and Czech Technical University in Prague, Czech Republic</i>	
<i>Mauro Vallati, University of Huddersfield, UK</i>	
<i>Simon Parkinson, University of Huddersfield, UK</i>	

**Theme: AI and Agents**

**CIVIA - Computational Intelligence and Video & Image Analysis Track**

**Track Co-Chairs:**     *Agostinho Rosa, University of Lisbon, Portugal*  
                               *Yin-Fu Huang, National Yunlin University of Science and Technology, Taiwan*

<b>Track Editorial</b> .....	195
------------------------------	-----

<b>2D Character Animating Networks: Bringing Static Characters to Move via Motion Transfer</b> .....	196
<i>Zackary P.T. Sin, The Hong Kong Polytechnic University, China</i>	
<i>Peter H.F. Ng, The Hong Kong Polytechnic University, China</i>	
<i>Simon C.K. Shiu, The Hong Kong Polytechnic University, China</i>	
<i>Fu-lai Chung, The Hong Kong Polytechnic University, China</i>	
<i>Hong Va Leong, The Hong Kong Polytechnic University, China</i>	

<b>An Effective Hybrid Imperialist Competitive Algorithm and Tabu Search for an Extended Flexible Job Shop Scheduling Problem</b> .....	204
<i>Willian Tessaro Lunardi, University of Luxembourg, Luxembourg</i>	
<i>Holger Voos, University of Luxembourg, Luxembourg</i>	
<i>Luiz Henrique Cherri, University of São Paulo, Brazil</i>	

<b>Visual Content based Video Retrieval on Natural Language Queries</b> .....	212
<i>Ravi Bansal, Google, India</i>	
<i>Sandip Chakraborty, Indian Institute of Technology Kharagpur, India</i>	

**Theme: AI and Agents**

**COMBI - Advances in COMputational Biomedical Imaging Track**

**Track Co-Chairs:** *Mohammed El Hassouni, Mohammed V University in Rabat, Morocco*  
*Rachid Jennane, University of Orleans, France*  
*Ayman El-Baz, University of Louisville, USA*

<b>BGrowth: An Efficient Approach for the Segmentation of Vertebral Compression Fractures in Magnet Resonance Imaging</b> .....	220
<i>Jonathan S. Ramos, University of São Paulo, Brazil</i>	
<i>Carolina Y.V. Watanabe, Federal University of Rondônia, Brazil</i>	
<i>Marcello H. Nogueira-Barbosa, University of São Paulo, Brazil</i>	
<i>Agma J.M. Traina, University of São Paulo, Brazil</i>	

**Theme: System Software and Security**

**CPS - Cyber-Physical Systems Track**

**Track Co-Chairs:** *Jingtong Hu, University of Pittsburgh, USA*  
*Jason Xue, City University of Hong Kong, Hong Kong*  
*Qi Zhu, Northwestern University, USA*

<b>Track Editorial</b> .....	228
------------------------------	-----

<b>AdaptC: Programming Adaptation Policies for WSN Applications</b> .....	229
<i>Shashank Gaur, Polytechnic Institute of Porto, Portugal</i>	
<i>Luis Almeida, University of Porto, Portugal</i>	
<i>Eduardo Tovar, Polytechnic Institute of Porto, Portugal</i>	

<b>Energy Optimization of Branch-Aware Data Variable Allocation on Hybrid SRAM+NVM SPM for CPS</b> .....	236
<i>Yixin Li, University of Electronic Science and Technology of China, China</i>	
<i>Jinyu Zhan, University of Electronic Science and Technology of China, China</i>	
<i>Wei Jiang, University of Electronic Science and Technology of China, China</i>	
<i>Jiayu Yu, University of Electronic Science and Technology of China, China</i>	

<b>Optimizing Fragmentation and Segment Cleaning for CPS based Storage Devices</b> .....	242
<i>Qi Li, Chongqing University, China</i>	
<i>Aosong Deng, Chongqing University, China</i>	
<i>Congming Gao, Chongqing University, China</i>	
<i>Yu Liang, City University of Hong Kong, China</i>	
<i>Liang Shi, East China Normal University, China</i>	
<i>Edwin H.-M. Sha, East China Normal University, China</i>	

<b>United SSD Block Cleaning via Constrained Victim Block Selection</b> .....	250
<i>Yajuan Du, Wuhan University of Technology, China</i>	
<i>Wei Liu, Wuhan University of Technology, China</i>	
<i>Yu Zhu, Huazhong University of Science and Technology, China</i>	
<i>Meng Zhang, Huazhong University of Science and Technology, China</i>	

### **Poster Papers**

<b>Emerging COTS Architecture Support for Real-Time TSN Ethernet</b> .....	258
<i>James Coleman, Intel Corporation, USA</i>	
<i>Sara Almalih, Intel Corporation, USA</i>	
<i>Alexander Slota, Intel Corporation, USA</i>	
<i>Yann-Hang Lee, Arizona State University, USA</i>	

### **Theme: Distributed Systems**

#### **DADS - Dependable, Adaptive, and Secure Distributed Systems Track**

**Track Co-Chairs:** *Karl M. Goeschka, UAS Technikum Vienna, Austria*  
*Rui Oliveira, Universidade do Minho, Portugal*  
*Peter Pietzuch, Imperial College London, UK*  
*Giovanni Russello, University of Auckland, New Zealand*

<b>Track Editorial</b> .....	266
------------------------------	-----

<b>A Library for Services Transparent Replication</b> .....	268
<i>Paola Martins Pereira, Universidade Federal do Rio Grande, Brazil</i>	
<i>Fernando Luis Dotti, Pontificia Universidade Católica do Rio Grande do Sul, Brazil</i>	
<i>Cristina Meinhardt, Universidade Federal de Santa Catarina, Brazil</i>	
<i>Odorico Machado Mendizabal, Universidade Federal do Rio Grande, Brazil</i>	

<b>Adaptive Information Dissemination in the Bitcoin Network</b> .....	276
<i>João Marçal, Instituto Superior Técnico, Universidade de Lisboa, Portugal</i>	
<i>Luís Rodrigues, Instituto Superior Técnico, Universidade de Lisboa, Portugal</i>	
<i>Miguel Matos, Instituto Superior Técnico, Universidade de Lisboa, Portugal</i>	

<b>Don't Hesitate to Share! A Novel IoT Data Protection Scheme based on BGN Cryptosystem</b> .....	284
<i>Subir Halder, University of Padua, Italy</i>	
<i>Mauro Conti, University of Padua, Italy</i>	

<b>Failure Prediction in the Internet of Things due to Memory Exhaustion</b> .....	292
<i>Mohammad Rafiuzzaman, The University of British Columbia, Canada</i>	
<i>Julien Gascon-Samson, The University of British Columbia, Canada</i>	
<i>Karthik Pattabiraman, The University of British Columbia, Canada</i>	
<i>Sathish Gopalakrishnan, The University of British Columbia, Canada</i>	

<b>Scalable Lightning Factories for Bitcoin</b> .....	302
<i>Alejandro Ranchal Pedrosa, Sorbonne University, France</i>	
<i>Maria Potop-Butucaru, Sorbonne University, France</i>	
<i>Sara Tucci-Piergiovanni, CEA LIST, France</i>	

<b>Planning Workflow Executions when using Spot Instances in the Cloud</b> .....	310
<i>Richard Gil Martinez, Universidade de Lisboa, Portugal</i>	
<i>Antónia Lopes, Universidade de Lisboa, Portugal</i>	
<i>Luís Rodrigues, Universidade de Lisboa, Portugal</i>	

**Quantitative Comparison of Unsupervised Anomaly Detection Algorithms for Intrusion Detection** ..... 318

*Filipe Falcão, Universidade Federal de Alagoas, Brazil*

*Tommaso Zoppi, University of Florence, Italy*

*Caio Barbosa Viera Silva, Universidade Federal de Alagoas, Brazil*

*Anderson Santos, Universidade Federal de Alagoas, Brazil*

*Baldoino Fonseca, Universidade Federal de Alagoas, Brazil*

*Andrea Ceccarelli, University of Florence, Italy*

*Andrea Bondavalli, University of Florence, Italy*

**Securely deploying Distributed Computation Systems on Peer-to-Peer Networks** ..... 328

*Kobe Vrancken, KU Leuven, Belgium*

*Frank Piessens, KU Leuven, Belgium*

*Raoul Strackx, KU Leuven, Belgium*

**Poster Papers**

**Distributed Storage System based on Permissioned Blockchain** ..... 338

*Racin Nygaard, University of Stavanger, Norway*

*Hein Meling, University of Stavanger, Norway*

*Leander Jehl, University of Stavanger, Norway*

**Is it Safe to Dockerize my Database Benchmark?** ..... 341

*Martin Grambow, Technische Universität Berlin, Germany*

*Jonathan Hasenburg, Technische Universität Berlin, Germany*

*Tobias Pfandzelter, Technische Universität Berlin, Germany*

*David Bermbach, Technische Universität Berlin, Germany*

**Theme: Distributed Systems**

**DAPP - Decentralized Applications with Blockchain, DLT and Crypto-Currencies Track**

**Track Co-Chairs:** *Jean-Marc Seigneur, University of Geneva, Switzerland and Reputation, France*

**Track Editorial** ..... 345

**Analysis of Architectural Variants for Auditable Blockchain-based Private Data Sharing** ..... 346

*Vincent Reniers, KU Leuven, Belgium*

*Dimitri Van Landuyt, KU Leuven, Belgium*

*Paolo Viviani, Noesis Solutions NV, University of Torino, Italy*

*Bert Lagaisse, KU Leuven, Belgium*

*Riccardo Lombardi, Noesis Solutions NV, Belgium*

*Wouter Joosen, KU Leuven, Belgium*

**Building Private Blockchains over Public Blockchains (PoP): An Attribute-Based Access Control Approach** ..... 355

*Dijiang Huang, Arizona State University, USA*

*Chun-Jen Chung, Arizona State University, USA*

*Qiuxiang Dong, Arizona State University, USA*

*Jim Luo, U.S. Naval Research Lab, USA*

*Myong Kang, U.S. Naval Research Lab, USA*

<b>DECOUPLES: A Decentralized, Unlinkable and Privacy-preserving Traceability System for the Supply Chain</b> .....	364
<i>Mourad El Maouchi, Delft University of Technology, The Netherlands</i>	
<i>Oğuzhan Ersoy, Delft University of Technology, The Netherlands</i>	
<i>Zekeriya Erkin, Delft University of Technology, The Netherlands</i>	
<b>Hybrid Mining: Exploiting Blockchain's Computational Power for Distributed Problem Solving</b> .....	374
<i>Krishnendu Chatterjee, Institute of Science and Technology Austria, Austria</i>	
<i>Amir Kafshdar Goharshady, Institute of Science and Technology Austria, Austria</i>	
<i>Arash Pourdamghani, Sharif University of Technology, Iran</i>	
<b>MUSCLE: Authenticated External Data Retrieval from Multiple Sources for Smart Contracts</b> .....	382
<i>Bjorn van der Laan, Delft University of Technology, The Netherlands</i>	
<i>Oğuzhan Ersoy, Delft University of Technology, The Netherlands</i>	
<i>Zekeriya Erkin, Delft University of Technology, The Netherlands</i>	
<b>Smart Contracts in View of the Civil Code</b> .....	392
<i>Monika di Angelo, Technische Universität Wien, Austria</i>	
<i>Alfred Soare, Technische Universität Wien, Austria</i>	
<i>Gernot Salzer, Technische Universität Wien, Austria</i>	
<b>The Treewidth of Smart Contracts</b> .....	400
<i>Krishnendu Chatterjee, Institute of Science and Technology Austria, Austria</i>	
<i>Amir Kafshdar Goharshady, Institute of Science and Technology Austria, Austria</i>	
<i>Ehsan Kafshdar Goharshady, Ferdowsi University of Mashhad, Iran</i>	
<b>TickEth, a Ticketing System built on Ethereum</b> .....	409
<i>Pietro Corsi, Università di Genova, Italy</i>	
<i>Giovanni Lagorio, Università di Genova, Italy</i>	
<i>Marina Ribaudò, Università di Genova, Italy</i>	
<b>Poster Papers</b>	
<b>Process Traceability in Distributed Manufacturing using Blockchains</b> .....	417
<i>Sebastian Geiger, Siemens Corporate Technology, USA</i>	
<i>Daniel Schall, Siemens Corporate Technology, USA</i>	
<i>Sebastian Meixner, Siemens Corporate Technology, USA</i>	
<i>Andreas Egger, Siemens Corporate Technology, USA</i>	

## **Theme: Information Systems**

### **DBDM - Databases and Big Data Management Track**

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

#### **Track Editorial** ..... 421

#### **A Noise Tolerant and Schema-agnostic Blocking Technique for Entity Resolution** ..... 422

*Tiago Brasileiro Araújo, Federal University of Campina Grande, Brazil*  
*Carlos Eduardo Santos Pires, Federal University of Campina Grande, Brazil*  
*Demetrio Gomes Mestre, State University of Paraíba, Brazil*  
*Thiago Pereira da Nóbrega, State University of Paraíba, Brazil*  
*Dimas Cassimiro do Nascimento Filho, Federal Rural University of Pernambuco, Brazil*  
*Kostas Stefanidis, University of Tampere, Finland*

#### **Authorization-Aware Optimization for Multi-Provider Queries** ..... 431

*Ekaterina B. Dimitrova, University of Pittsburgh, USA*  
*Panos K. Chrysanthis, University of Pittsburgh, USA*  
*Adam J. Lee, University of Pittsburgh, USA*

#### **Efficient Spatio-temporal RDF Query Processing in Large Dynamic Knowledge Bases** ..... 439

*Akrivi Vlachou, University of Piraeus, Greece*  
*Christos Doulkeridis, University of Piraeus, Greece*  
*Apostolos Glenis, University of Piraeus, Greece*  
*Georgios M. Santipantakis, University of Piraeus, Greece*  
*George A. Vouros, University of Piraeus, Greece*

#### **MapReduce Algorithms for the K Group Nearest-Neighbor Query** ..... 448

*Panagiotis Moutafis, University of Thessaly, Greece*  
*Francisco García-García, University of Almeria, Spain*  
*George Mavrommatis, University of Thessaly, Greece*  
*Michael Vassilakopoulos, University of Thessaly, Greece*  
*Antonio Corral, University of Almeria, Spain*  
*Luis Iribarne, University of Almeria, Spain*

#### **Toward RDB to NoSQL: Transforming Data with Metamorfose Framework** ..... 456

*Evandro Miguel Kuszera, Technological Federal University of Paraná, Brazil*  
*Leticia M. Peres, Federal University of Paraná, Brazil*  
*Marcos Didonet Del Fabro, Federal University of Paraná, Brazil*

### **Poster Papers**

#### **A Scalable and Persistent Key-Value Store using Non-Volatile Memory** ..... 464

*Doyoung Kim, Yonsei University, South Korea*  
*Won Gi Choi, Yonsei University, South Korea*  
*Hanseung Sung, Yonsei University, South Korea*  
*Sanghyun Park, Yonsei University, South Korea*

**The SimilarQL Framework: Similarity Queries in Plain SQL** ..... 468

*Caetano Traina Jr., University of São Paulo, Brazil*

*Andre Moriyama, University of São Paulo, Brazil*

*Guilherme Rocha, University of São Paulo, Brazil*

*Robson Cordeiro, University of São Paulo, Brazil*

*Cristina D.A. Ciferri, University of São Paulo, Brazil*

*Agma Traina, University of São Paulo, Brazil*

**Theme: Information Systems**

**DLHWB - Digital Life for Human Well-being Track**

**Track Co-Chairs:** *Sara Comai, Politecnico di Milano, Italy*

*Luc De Witte, The University of Sheffield, UK*

*Fabio Salice, Politecnico di Milano, Italy*

**Track Editorial** ..... 472

**Anatome: Anatomy Teaching and Learning Designed for All** ..... 474

*Márcia Valéria Rodrigues Ferreira, Centro Federal de Educação Tecnológica de Minas Gerais, Brazil*

*Laura Sánchez García, Universidade Federal do Paraná, Brazil*

*André Luiz Pires Guedes, Universidade Federal do Paraná, Brazil*

*Djanira Aparecida da Luz Veronez, Universidade Federal do Paraná, Brazil*

*Celia Regina Alves de Araújo Sandrini, Instituto Federal do Paraná, Brazil*

*Carlos Eduardo de Araujo, Instituto Federal do Paraná, Brazil*

**Web-based Authoring of Multimedia Intervention Programs for Mobile Devices: A Case Study on Elderly Digital Literacy** ..... 484

*Bruna C.R. Cunha, Federal Institute of São Paulo, Brazil*

*Kamila R.H. Rodrigues, University of São Paulo, Brazil*

*Isabela Zaine, University of São Paulo, Brazil*

*Leonardo F. Scalco, University of São Paulo, Brazil*

*Caio C. Viel, University of São Paulo, Brazil*

*Maria da Graça C. Pimentel, University of São Paulo, Brazil*

**Theme: Information Systems**

**DM - Data Mining Track**

**Track Co-Chairs:** *Hasan Jamil, University of Idaho, USA*

*Rosa Meo, Università degli Studi di Torino, Italy*

**Track Editorial** ..... 492

**An Anomaly Detection Technique for Business Processes based on Extended Dynamic Bayesian Networks** ..... 494

*Stephen Pauwels, University of Antwerp, Belgium*

*Toon Calders, University of Antwerp, Belgium*

**Dirichlet Process Mixture Models made Scalable and Effective by means of Massive Distribution** ..... 502

*Khadidja Meguelati, INRIA, France*

*Bénédicte Fontez, Montpellier SupAgro, France*

*Nadine Hilgert, INRA, France*

*Florent Masseglia, INRIA, France*

<b>Explaining Black Box Models by means of Local Rules</b> .....	510
<i>Eliana Pastor, Politecnico di Torino, Italy</i>	
<i>Elena Baralis, Politecnico di Torino, Italy</i>	
<b>Graph-based Selective Outlier Ensembles</b> .....	518
<i>Hamed Sarvari, George Mason University, USA</i>	
<i>Carlotta Domeniconi, George Mason University, USA</i>	
<i>Giovanni Stilo, Sapienza Università di Roma, Italy</i>	
<b>High-Performance Probabilistic Record Linkage via Multi-Dimensional Homomorphisms</b> .....	526
<i>Ari Rasch, University of Münster, Germany</i>	
<i>Richard Schulze, University of Münster, Germany</i>	
<i>Waldemar Gorus, University of Münster, Germany</i>	
<i>Jan Hiller, Krebsregister NRW, Germany</i>	
<i>Sebastian Bartholomäus, Krebsregister NRW, Germany</i>	
<i>Sergei Gorlatch, University of Münster, Germany</i>	
<b>Pairwise Normalization in SimRank Variants: Problem, Solution, and Evaluation</b> .....	534
<i>Masoud Reyhani Hamedani, Hanyang University, South Korea</i>	
<i>Sang-Wook Kim, Hanyang University, South Korea</i>	
 <b>Poster Papers</b>	
<b>K-mixed Prototypes: A Clustering Algorithm for Relational Data with Mixed Attribute Types</b> .....	542
<i>Rahmah Brnawy, Taibah University, Saudi Arabia</i>	
<i>Nematollaah Shiri, Concordia University, Canada</i>	
<b>Mining Product Opinions with Most Frequent Clusters of Aspect Terms</b> .....	546
<i>Chukwuma Ejieh, IBM, Canada</i>	
<i>C.I. Ezeife, University of Windsor, Canada</i>	
<i>Ritu Chaturvedi, University of Guelph, Canada</i>	
 <b>Student Research Abstract</b>	
<b>Student Research Abstract: Cryptocurrency World Identification and Public Concerns Detection via Social Media</b> .....	550
<i>Shaista Bibi, COMSATS University Islamabad, Pakistan</i>	
<b>Student Research Abstract: Fuzzy-Rule based Approach for Feature Selection in Text Classification</b> .....	553
<i>Bushra Zaheer Abbasi, COMSATS University Islamabad, Pakistan</i>	

## **Theme: Information Systems**

### **DS - Data Streams Track**

**Track Co-Chairs:** *Albert Bifet, LTCI, Telecom ParisTech, France*  
*Andre Carvalho, ICMC, USP, Brazil*  
*Carlos Ferreira, INESC Porto, University of Porto, Portugal*  
*João Gama, INESC Porto, University of Porto, Portugal*

**Track Editorial** ..... 556

**DataSeg: Dynamic Streaming Sensor Data Segmentation for Activity Recognition** ..... 557

*Hela Sfar, Télécom SudParis, France*  
*Amel Bouzeghoub, Télécom SudParis, France*

**Exploiting Entity Information for Stream Classification over a Stream of Reviews** ..... 564

*Christian Beyer, Otto-von-Guericke-University Magdeburg, Germany*  
*Vishnu Unnikrishnan, Otto-von-Guericke-University Magdeburg, Germany*  
*Uli Niemann, Otto-von-Guericke-University Magdeburg, Germany*  
*Pawel Matuszyk, Otto-von-Guericke-University Magdeburg, Germany*  
*Eirini Ntoutsi, Leibniz University Hannover, Germany*  
*Myra Spiliopoulou, Otto-von-Guericke-University Magdeburg, Germany*

**Learning Regularized Hoeffding Trees from Data Streams** ..... 574

*Jean Paul Barddal, Pontificia Universidade Católica do Paraná, Brazil*  
*Fabricao Enembreck, Pontificia Universidade Católica do Paraná, Brazil*

**Quotient Hash Tables – Efficiently Detecting Duplicates in Streaming Data** ..... 582

*Rémi Géraud, École normale supérieure, CNRS, PSL, France*  
*Marius Lombard-Platet, École normale supérieure, CNRS, PSL, France*  
*David Naccache, École normale supérieure, CNRS, PSL, France*

### **Poster Papers**

**Decision Tree-based Feature Ranking in Concept Drifting Data Streams** ..... 590

*Jean Antonio Pereira Karax, Pontificia Universidade Católica do Paraná, Brazil*  
*Andreia Malucelli, Pontificia Universidade Católica do Paraná, Brazil*  
*Jean Paul Barddal, Pontificia Universidade Católica do Paraná, Brazil*

**Streaming Piecewise Linear Approximation for Efficient Data Management in Edge Computing** ..... 593

*Romarc Duvignau, Chalmers University of Technology, Sweden*  
*Vincenzo Gulisano, Chalmers University of Technology, Sweden*  
*Marina Papatriantafidou, Chalmers University of Technology, Sweden*  
*Vladimir Savic, Qamcom R&T, Sweden*

**Theme: System Software and Security**

**EMBS - Embedded Systems Track**

**Track Co-Chairs:** *Marco Di Natale, Scuola Superiore S. Anna, Italy*  
*Li-Pin Chang, National Chiao Tung University, Taiwan*

**Track Editorial** ..... 597

**A New Sequential-Write-Constrained Cache Management to Mitigate Write Amplification for SMR Drives** ..... 599

*Shuo-Han Chen, Academia Sinica, Taiwan*  
*Yong-Ching Lin, National Tsing Hua University, Taiwan*  
*Yuan-Hao Chang, Academia Sinica, Taiwan*  
*Ming-Chang Yang, The Chinese University of Hong Kong, China*  
*Tseng-Yi Chen, Yuan Ze University, Taiwan*  
*Hsin-Wen Wei, Tamkang University, Taiwan*  
*Wei-Kuan Shih, National Tsing Hua University, Taiwan*

**A Time-predictable Branch Predictor** ..... 607

*Martin Schoeberl, Technical University of Denmark, Denmark*  
*Benjamin Rouxel, INRIA Rennes, France*  
*Isabelle Puaut, INRIA Rennes, France*

**Energy-Demand Estimation of Embedded Devices using Deep Artificial Neural Networks** ..... 617

*Timo Hönig, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*  
*Benedict Herzog, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*  
*Wolfgang Schröder-Preikschat, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*

**On Assessing the Viability of Probabilistic Scheduling with Dependent Tasks** ..... 625

*Jaume Abella, Barcelona Supercomputing Center, Spain*  
*Enrico Mezzetti, Barcelona Supercomputing Center, Spain*  
*Francisco J. Cazorla, Barcelona Supercomputing Center, Spain*

**Refresh Optimised Embedded-DRAM Caches based on Zero Data Detection** ..... 635

*Sheel Sindhu Manohar, Indian Institute of Technology Guwahati, India*  
*Hemangee K. Kapoor, Indian Institute of Technology Guwahati, India*

**Poster Papers**

**Impact of Source Scheduling on End-to-End Latencies in a QoS-aware Avionics Network** ..... 643

*Oana Hotescu, Université de Toulouse, France*  
*Katia Jaffrès-Runser, Université de Toulouse, France*  
*Jean-Luc Scharbarg, Université de Toulouse, France*  
*Christian Fraboul, Université de Toulouse, France*

**Graphical Program Transformations for Embedded Systems** ..... 647

*Robert Stewart, Heriot-Watt University, UK*  
*Bernard Berthomieu, Université de Toulouse, France*  
*Paulo Garcia, Carleton University, Canada*  
*Idris Ibrahim, Heriot-Watt University, UK*  
*Greg Michaelson, Heriot-Watt University, UK*  
*Andrew Wallace, Heriot-Watt University, UK*

## **Theme: Information Systems**

### **GIA - GeoInformation Analytics Track**

**Track Co-Chairs:** *Maguelonne Teisseire, UMR TETIS, France*  
*Christian Sallaberry, University of Pau and Pays de l'Adour, France*  
*Eric Kergosien, University of Lille, France*  
*Cyril de Runz, University of Reims, France*  
*Thomas Guyet, AGROCAMPUS-OUEST/IRISA, France*

**Track Editorial** ..... 650

**A Graph based Approach for Functional Urban Areas Delineation** ..... 652

*Noudéhouéno L.J. Houssou, University of La Rochelle, France*  
*Jean-Loup Guillaume, University of La Rochelle, France*  
*Armelle Prigent, University of La Rochelle, France*

**A Transfer Learning Paradigm for Spatial Networks** ..... 659

*Chidubem Iddianozie, University College Dublin, Ireland*  
*Gavin McArdle, University College Dublin, Ireland*

**Algorithms for Mountain Peaks Discovery: A Comparison** ..... 667

*Rocio Nahime Torres, Politecnico di Milano, Italy*  
*Federico Milani, Politecnico di Milano, Italy*  
*Piero Fraternali, Politecnico di Milano, Italy*

**From Spatio-Temporal Data to Chronological Networks: An Application to Wildfire Analysis** ..... 675

*Didier A. Vega-Oliveros, University of São Paulo, Brazil*  
*Moshé Cotacallapa, National Institute for Space Research, Brazil*  
*Leonardo N. Ferreira, National Institute for Space Research, Brazil*  
*Marcos G. Quiles, Federal University of São Paulo, Brazil*  
*Liang Zhao, University of São Paulo, Brazil*  
*Elbert E.N. Macau, Federal University of São Paulo, Brazil*  
*Manoel F. Cardoso, National Institute for Space Research, Brazil*

### **Poster Papers**

**Similarity-based Visual Exploration of Very Large Georeferenced Multidimensional Datasets** ..... 683

*Roger Peralta-Aranibar, Universidad Católica San Pablo, Peru*  
*Cicero A.L. Pahins, Universidade Federal do Rio Grande do Sul, Brazil*  
*Joao L.D. Comba, Universidade Federal do Rio Grande do Sul, Brazil*  
*Erick Gomez-Nieto, Universidad Católica San Pablo, Peru*

**The Role of Geographic Knowledge in Sub-City Level Geolocation** ..... 687

*Laura Di Rocco, Università di Genova, Italy*  
*Davide Buscaldi, LIPN, Université Paris 13, France*  
*Michela Bertolotto, University College Dublin, Ireland*  
*Barbara Catania, Università di Genova, Italy*  
*Giovanna Guerrini, Università di Genova, Italy*

**Theme: AI and Agents**

**HCI - Smart Human Computer Interaction Track**

**Track Co-Chairs:** *Anand Paul, Kyungpook National University, South Korea*  
*Soon Ki Jung, Kyungpook National University, South Korea*  
*Awais Ahmad, University of Milan, Italy*  
*Ganesh Kumar P., Anna University, India*

**Track Editorial** ..... 690

**Detecting Stress from Mouse-Gaze Attraction** ..... 692

*Jun Wang, The Hong Kong Polytechnic University, China*  
*Eugene Yujun Fu, The Hong Kong Polytechnic University, China*  
*Grace Ngai, The Hong Kong Polytechnic University, China*  
*Hong Va Leong, The Hong Kong Polytechnic University, China*  
*Michael Xuelin Huang, Max Planck Institute for Informatics, Germany*

**Effects of Virtual-Avatar Motion-Synchrony Levels on Full-Body Interaction** ..... 701

*Changyeol Choi, Hanyang University, South Korea*  
*Joohee Jun, Hanyang University, South Korea*  
*Jiwoong Heo, Hanyang University, South Korea*  
*Kwanguk Kim, Hanyang University, South Korea*

**Smart Contract's Interface for User Centric Business Model in Blockchain** ..... 709

*Malik Junaid Jami Gul, Kyungpook National University, South Korea*  
*Anand Paul, Kyungpook National University, South Korea*  
*Awais Ahmad, Bahira University, Pakistan*  
*Murad Khan, Sarhad University of Science and Information Technology, Pakistan*  
*Gwanggil Jeon, Incheon National University, South Korea*

**Stylus Knife: Improve Cutting Skill for Paper-cutting by Implementing Pressure Control** ..... 714

*Takafumi Higashi, Japan Advanced Institute of Science and Technology, Japan*  
*Hideaki Kanai, Japan Advanced Institute of Science and Technology, Japan*

**Student Research Abstract**

**Student Research Abstract: Towards Textualising Analytic Provenance for Visual Analytics using Natural Language Generation** ..... 722

*Waqas Khawaja, National University of Ireland Galway, Ireland*

**Student Research Abstract: Human-enabled Sustainable Management of Mobile Cloud on 5G Network** ..... 726

*Sadia Din, Kyungpook National University, South Korea*

**Theme: Information Systems**

**HI - Health Informatics Track**

**Track Co-Chairs:** *Anu Mary Chako, National Institute of Technology Calicut, India*  
*Gopakumar G, National Institute of Technology Calicut, India*

**Track Editorial** ..... 728

**A Two-Step Approach to Predictive Modeling of Individual-based Environmental Health Risks** ..... 729

*Wan D. Bae, Hanyang University, South Korea*  
*Matthew Horak, Hanyang University, South Korea*  
*Shayma Alkobaisi, United Arab Emirates University, UAE*  
*Sehjeong Kim, United Arab Emirates University, UAE*  
*Sada Narayanappa, Lockheed Martin, USA*  
*Choon-Sik Park, Soonchunhyang University Bucheon Hospital, South Korea*  
*Da Jeong Bae, Soonchunhyang University Bucheon Hospital, South Korea*

**Applying Situation-Awareness for Recommending Phonological Processes in the Children's Speech** ..... 739

*Maria Helena Franciscatto, Federal University of Santa Maria, Brazil*  
*João Carlos Damasceno Lima, Federal University of Santa Maria, Brazil*  
*Celio Trois, Federal University of Santa Maria, Brazil*  
*Vinicius Maran, Federal University of Santa Maria, Brazil*  
*Marcia Keske Soares, Federal University of Santa Maria, Brazil*  
*Cristiano Cortez da Rocha, Penguin Formula, Portugal*

**Graph Sparsification with Parallelization to Optimize the Identification of Causal Genes and Dysregulated Pathways** ..... 747

*Jeethu V. Devasia, National Institute of Technology Calicut, India*  
*Priya Chandran, National Institute of Technology Calicut, India*  
*Anjana Soman, National Institute of Technology Calicut, India*  
*Aiswarya Elezabeth Mathew, National Institute of Technology Calicut, India*  
*Jaya Jharwal, National Institute of Technology Calicut, India*

**Leveraging the Link Quality Awareness for Body Node Coordinator (BNC) Placement in WBANs** ..... 754

*Rim Negra, University of Manouba, Tunisia*  
*Imen Jemili, University of Manouba, Tunisia*  
*Akka Zemmari, Université de Bordeaux, France*  
*Mohamed Mosbah, Université de Bordeaux, France*  
*Abdelfettah Belghith, King Saud University Saudi Arabia, Saudi Arabia*  
*Nesrine Ouled Abdallah, Université de Bordeaux, France*

**Resolving Data Interoperability in Ubiquitous Health Profile using Semi-Structured Storage and Processing** ..... 762

*Fahad Ahmed Satti, Kyung Hee University, South Korea*  
*Wajahat Ali Khan, Kyung Hee University, South Korea*  
*Ganghun Lee, Kyung Hee University, South Korea*  
*Asad Masood Khattak, Zayed University, UAE*  
*Sungyoung Lee, Kyung Hee University, South Korea*

## Poster Papers

<b>An Iterative Oversampling Approach for Ordinal Classification</b> .....	771
<i>Francisco Marques, Universidade de Coimbra, Portugal</i>	
<i>Hugo Duarte, IPO-Porto Research Centre, Portugal</i>	
<i>João Santos, IPO-Porto Research Centre, Portugal</i>	
<i>Inês Domingues, IPO-Porto Research Centre and University of Coimbra, Portugal</i>	
<i>José P. Amorim, IPO-Porto Research Centre and University of Coimbra, Portugal</i>	
<i>Pedro H. Abreu, University of Coimbra, Portugal</i>	

<b>IPBN: Alerts Management in Intravenous Electromedical Devices using Bayesian Networks</b> .....	775
<i>Fabício Ferreira, Federal University of Pelotas, Brazil</i>	
<i>Adenauer Yamin, Federal University of Pelotas, Brazil</i>	
<i>Ana Pernas, Federal University of Pelotas, Brazil</i>	
<i>Luciano Agostini, Federal University of Pelotas, Brazil</i>	
<i>Alexandre de Souza, Federal Institute of Education, Science and Technology of Rio Grande do Sul, Brazil</i>	
<i>Jorge Barbosa, University of Vale do Rio dos Sinos, Brazil</i>	

## Student Research Abstract

<b>Student Research Abstract: Mortality Prediction using Medical Notes</b> .....	778
<i>Mahnaz Koupae, University of California Santa Barbara, USA</i>	

<b>Video-Based Decision Support for Behavioral Veterinarians: A Case Study of Canine ADHD</b> .....	782
<i>Asaf Fux, University of Haifa, Israel</i>	

## Theme: Information Systems

### IAR - Information Access and Retrieval Track

**Track Co-Chairs:** *Gloria Bordogna, Consiglio Nazionale delle Ricerche – CNR IREA, Italy*  
*Gabriella Pasi, Università degli Studi di Milano Bicocca -DISCo, Italy*

<b>Track Editorial</b> .....	786
------------------------------	-----

<b>aMV-LSTM: An Attention-based Model with Multiple Positional Text Matching</b> .....	788
<i>Thiziri Belkacem, Paul Sabatier University, France</i>	
<i>Taoufiq Dkaki, Jean Jaures University, France</i>	
<i>Jose G. Moreno, Paul Sabatier University, France</i>	
<i>Mohand Boughanem, Paul Sabatier University, France</i>	

<b>Ask Toscanini! – Architecting a Search Engine for Music Scores beyond Metadata</b> .....	796
<i>Arman Bahraini, Virginia Polytechnic Institute and State University, USA</i>	
<i>Eli Tilevich, Virginia Polytechnic Institute and State University, USA</i>	

<b>Automatically Assessing the Quality of Wikipedia Contents</b> .....	804
<i>Elias Bassani, Università degli Studi di Milano-Bicocca and Consorzio C2T, Italy</i>	
<i>Marco Viviani, Università degli Studi di Milano-Bicocca, Italy</i>	

<b>Hybrid Molecule-based Information Retrieval</b> .....	808
<i>Nathalie Charbel, University of Pau and Pays de l'Adour, France</i>	
<i>Christian Sallaberry, University of Pau and Pays de l'Adour, France</i>	
<i>Sebastien Laborie, University of Pau and Pays de l'Adour, France</i>	
<i>Richard Chbeir, University of Pau and Pays de l'Adour, France</i>	

**The Importance of being Dissimilar in Recommendation** ..... 816

*Vito Walter Anelli, Politecnico di Bari, Italy*  
*Tommaso Di Noia, Politecnico di Bari, Italy*  
*Eugenio Di Sciascio, Politecnico di Bari, Italy*  
*Azzurra Ragone, Independent Researcher, Italy*  
*Joseph Trotta, Politecnico di Bari, Italy*

**Theme: System Software and Security**

**IoT - Internet of Things Track**

**Track Co-Chairs:** *Gail-Joon Ahn, Arizona State University, USA*  
*Seong-Je Cho, Dankook University, South Korea*  
*Jun Zheng, New Mexico Institute of Mining and Technology, USA*

**Track Editorial** ..... 822

**An Architecture and its Tools for Integrating IoT and BPMN in Agriculture Scenarios** ..... 824

*Jordano R. Celestrini, Federal University of Espirito Santo, Brazil*  
*Renato N. Rocha, Federal University of Espirito Santo, Brazil*  
*Estêvão B. Saleme, Federal University of Espirito Santo, Brazil*  
*Celso A.S. Santos, Federal University of Espirito Santo, Brazil*  
*José G. Pereira Filho, Federal University of Espirito Santo, Brazil*  
*Rodrigo V. Andreão, Federal Institute of Espirito Santo, Brazil*

**CyprIoT: Framework for Modelling and Controlling Network-Based IoT Applications** ..... 832

*Imad Berrouyne, IMT Atlantique and University of Quebec at Rimouski, France*  
*Mehdi Adda, University of Quebec at Rimouski, Canada*  
*Jean-Marie Mottu, IMT Atlantique, France*  
*Jean-Claude Royer, IMT Atlantique, France*  
*Massimo Tisi, IMT Atlantique, France*

**Ensemble Trees Learning based Improved Predictive Maintenance using IIoT for Turbofan Engines** ..... 842

*Sourajit Behera, Indian Institute of Technology Patna, India*  
*Anurag Choubey, Indian Institute of Technology Patna, India*  
*Chandresh S. Kanani, Indian Institute of Technology Patna, India*  
*Yashwant Singh Patel, Indian Institute of Technology Patna, India*  
*Rajiv Misra, Indian Institute of Technology Patna, India*  
*Alberto Sillitti, Innopolis University, Russia*

**iCORE: Continuous and Proactive Extrospection on Multi-core IoT Devices** ..... 851

*Penghui Zhang, Arizona State University, USA*  
*Haehyun Cho, Arizona State University, USA*  
*Ziming Zhao, Arizona State University, USA*  
*Adam Doupé, Arizona State University, USA*  
*Gail-Joon Ahn, Arizona State University, USA*

**Privacy-Preserving Delegable Authentication in the Internet of Things** ..... 861

*Clémentine Gritti, Norwegian University of Science and Technology, Norway*  
*Melek Önen, EURECOM, France*  
*Refik Molva, EURECOM, France*

**Separate Session Key Generation Approach for Network and Application flows in LoRaWAN** ..... 870

*Suman Bala, Orange, France*  
*Dominique Barthel, Orange, France*  
*Säid Gharout, Orange, France*

<b>Toward a Lightweight Ontology for Privacy Protection in IoT</b> .....	880
<i>Mayke Ferreira Arruda, Universidade Federal de Goiás, Brazil</i>	
<i>Renato Freitas Bulcão-Neto, Universidade Federal de Goiás, Brazil</i>	
 <b>Poster Papers</b>	
<b>Hygieia: Data Quality Assessment for Smart Sensor Network</b> .....	889
<i>Gabriel R. Caldas de Aquino, Universidade Federal do Rio de Janeiro, Brazil</i>	
<i>Claudio M. de Farias, Universidade Federal do Rio de Janeiro, Brazil</i>	
<i>Luci Pirmez, Universidade Federal do Rio de Janeiro, Brazil</i>	
<b>PEDAL: Power-Delay Product Objective Function for Internet of Things Applications</b> .....	892
<i>Bardia Safaei, Sharif University of Technology, Iran</i>	
<i>Ali Asghar Mohammad Salehi, Sharif University of Technology, Iran</i>	
<i>Maryam Shirbeigi, Sharif University of Technology, Iran</i>	
<i>Amir Mahdi Hosseini Monazzah, Institute for Research in Fundamental Sciences, Iran</i>	
<i>Alireza Ejlali, Sharif University of Technology, Iran</i>	
 <b>Theme: AI and Agents</b>	
<b>IRMAS - Intelligent Robotics and Multi-Agent Systems Track</b>	
<b>Track Co-Chairs:</b> <i>Rui P. Rocha, ISR – University of Coimbra, Portugal</i>	
<i>Daniel Kudenko, University of York, UK</i>	
 <b>Track Editorial</b> .....	896
<b>Communication-based Cooperative Tasks: How the Language Expressiveness affects Reinforcement Learning</b> .....	898
<i>Jacopo Talamini, Università degli studi di Trieste, Italy</i>	
<i>Eric Medvet, Università degli studi di Trieste, Italy</i>	
<i>Alberto Bartoli, Università degli studi di Trieste, Italy</i>	
 <b>Correlation Clustering based Coalition Formation for Multi-Robot Task Allocation</b> .....	906
<i>Ayan Dutta, University of North Florida, USA</i>	
<i>Vladimir Ufimtsev, East Central University, USA</i>	
<i>Asai Asaithambi, University of North Florida, USA</i>	
 <b>Distributed Adaptive-Neighborhood Control for Stochastic Reachability in Multi-Agent Systems</b> .....	914
<i>Anna Lukina, Technische Universität Wien, Austria</i>	
<i>Ashish Tiwari, SRI International, USA</i>	
<i>Scott A. Smolka, Stony Brook University, USA, USA</i>	
<i>Radu Grosu, Technische Universität Wien, Austria</i>	
 <b>Hierarchical Multi-Agent Deep Reinforcement Learning to Develop Long-Term Coordination</b> .....	922
<i>Marie Ossenkopf, Universität Kassel, Germany</i>	
<i>Mackenzie Jorgensen, Villanova University, USA</i>	
<i>Kurt Geihs, Universität Kassel, Germany</i>	

<b>Subspace Clustering for Situation Assessment in Aquatic Drones</b> .....	930
<i>Alberto Castellini, Verona University, Italy</i>	
<i>Francesco Masillo, Verona University, Italy</i>	
<i>Manuele Bicego, Verona University, Italy</i>	
<i>Domenico Bloisi, Verona University, Italy</i>	
<i>Jason Blum, Verona University, Italy</i>	
<i>Alessandro Farinelli, Verona University, Italy</i>	
<i>Sergio Peigner, Université de Lyon, France</i>	
<b>Support Vector Regression based Sensor Localization using UAV</b> .....	938
<i>Rolif Lima, Tata Consultancy Services, India</i>	
<i>Kaushik Das, Tata Consultancy Services, India</i>	
<i>Debashish Ghose, Indian Institute of Science Bangalore, India</i>	
<b>Trail Formation using Large Swarms of Minimal Robots</b> .....	946
<i>Pere Molins, University of Bristol, UK</i>	
<i>Sabine Hauert, University of Bristol, UK</i>	
<b>Poster Papers</b>	
<b>RoboPlanner : Autonomous Robotic Action Planning via Knowledge Graph Queries</b> .....	953
<i>Ajay Kattapur, Tata Consultancy Services, India</i>	
<i>Balamuralidhar P, Tata Consultancy Services, India</i>	
<b>Social Robot Navigation based on HRI Non-verbal Communication: A Case Study on Avocado Harvesting</b> .....	957
<i>Juan Pablo Vasconez, Universidad Técnica Federico Santa María, Chile</i>	
<i>Leonardo Guevara, Universidad Técnica Federico Santa María, Chile</i>	
<i>Fernando Auat Cheein, Universidad Técnica Federico Santa María, Chile</i>	
<b>Student Research Abstract</b>	
<b>Student Research Abstract: Taking Stigmergy out of the Lab and into the Field</b> .....	961
<i>Siobhan Duncan, Heriot-Watt University, UK</i>	
<b>Theme: AI and Agents</b>	
<b>KLP - Knowledge and Language Processing Track</b>	
<b>Track Co-Chairs:</b> <i>Mauro Dragoni, Fondazione Bruno Kessler (FBK), Italy</i>	
<i>Marco Rospocher, University of Verona, Italy</i>	
<b>Track Editorial</b> .....	965
<b>A Case-based Approach using Phonological Knowledge for Identifying Error Patterns in Children's Speech</b> .....	968
<i>Maria Helena Franciscatto, Federal University of Santa Maria, Brazil</i>	
<i>João Carlos Damasceno Lima, Federal University of Santa Maria, Brazil</i>	
<i>Celio Trois, Federal University of Santa Maria, Brazil</i>	
<i>Vinicius Maran, Federal University of Santa Maria, Brazil</i>	
<i>Márcia Keske Soares, Federal University of Santa Maria, Brazil</i>	
<i>Cristiano Cortez da Rocha, Penguin Formula, Portugal</i>	

<b>Detecting Reliable Novel Word Senses: A Network-Centric Approach</b> .....	976
<i>Abhik Jana, Indian Institute of Technology Kharagpur, India</i>	
<i>Animesh Mukherjee, Indian Institute of Technology Kharagpur, India</i>	
<i>Pawan Goyal, Indian Institute of Technology Kharagpur, India</i>	
<b>Exploring Lexico-Semantic Patterns for Aspect-Based Sentiment Analysis</b> .....	984
<i>Frederique Baas, Erasmus University Rotterdam, The Netherlands</i>	
<i>Olivier Bus, Erasmus University Rotterdam, The Netherlands</i>	
<i>Alexander Osinga, Erasmus University Rotterdam, The Netherlands</i>	
<i>Nikki van de Ven, Erasmus University Rotterdam, The Netherlands</i>	
<i>Steffie van Loenhout, Erasmus University Rotterdam, The Netherlands</i>	
<i>Lisanne Vrolijk, Erasmus University Rotterdam, The Netherlands</i>	
<i>Kim Schouten, Erasmus University Rotterdam, The Netherlands</i>	
<i>Flavius Frasinca, Erasmus University Rotterdam, The Netherlands</i>	
<b>Few-shot Classification in Named Entity Recognition task</b> .....	993
<i>Alexander Fritzer, Moscow Institute of Physics and Technology and Quantum Brains, Russia</i>	
<i>Varvara Logacheva, Moscow Institute of Physics and Technology, Russia</i>	
<i>Maksim Kretov, Moscow Institute of Physics and Technology, Russia</i>	
<b>Out-of-context Fine-grained Multi-word Entity Classification</b> .....	1001
<i>Guillaume Jacquet, European Commission, Italy</i>	
<i>Jakub Piskorski, European Commission, Italy</i>	
<i>Sophie Chesney, Queen Mary University of London, UK</i>	
<b>Populating the Knowledge Base of a Conversational Agent: Human vs. Machine</b> .....	1011
<i>Hugo Rodrigues, Técnico Lisboa, Portugal</i>	
<i>Luisa Coheur, Técnico Lisboa, Portugal</i>	
<i>Eric Nyberg, Carnegie Mellon University, USA</i>	
<b>Same but Different: Distant Supervision for Predicting and Understanding Entity Linking Difficulty</b> .....	1019
<i>Renato Stoffalette João, University of Hannover, Germany</i>	
<i>Pavlos Fafalios, University of Hannover, Germany</i>	
<i>Stefan Dietze, GESIS Leibniz Institute for the Social Sciences, Germany</i>	
<b>Study of Linguistic Features Incorporated in a Literary Book Recommender System</b> .....	1027
<i>Haiifa Alharthi, University of Ottawa, Canada</i>	
<i>Diana Inkpen, University of Ottawa, Canada</i>	
<b>Unveiling Middle-Level Concepts through Frequency Trajectories and Peaks Analysis</b> .....	1035
<i>Luigi Di Caro, University of Turin, Italy</i>	
<i>Alice Ruggeri, University of Turin, Italy</i>	
<b>Vocabulary based Community Detection and Characterization</b> .....	1043
<i>Giorgia Ramponi, Politecnico di Milano, Italy</i>	
<i>Marco Brambilla, Politecnico di Milano, Italy</i>	
<i>Stefano Ceri, Politecnico di Milano, Italy</i>	
<i>Florian Daniel, Politecnico di Milano, Italy</i>	
<i>Marco Di Giovanni, Politecnico di Milano, Italy</i>	

## Poster Papers

<b>A Hybrid Deep Learning Network for Modelling Opinionated Content</b> .....	1051
<i>Pantelis Agathangelou, University of Nicosia, Cyprus</i>	
<i>Ioannis Katakis, University of Nicosia, Cyprus</i>	

<b>A Portable Grammar-based NLG System for Verbalization of Structured Data</b> .....	1054
<i>Simon Mille, Universitat Pompeu Fabra, Spain</i>	
<i>Stamatia Dasiopoulou, Universitat Pompeu Fabra, Spain</i>	
<i>Leo Wanner, ICREA and Universitat Pompeu Fabra, Spain</i>	

<b>Looking into the Past: Evaluating the Effect of Time Gaps in a Personalized Sentiment Model</b> .....	1057
<i>Siwen Guo, University of Luxembourg, Luxembourg</i>	
<i>Sviatlana Höhn, University of Luxembourg, Luxembourg</i>	
<i>Christoph Schommer, University of Luxembourg, Luxembourg</i>	

<b>Overwhelmed by Negative Emotions? Maybe You are being Cyber-bullied!</b> .....	1061
<i>Pinar Arslan, Université Côte d'Azur, France</i>	
<i>Michele Corazza, Université Côte d'Azur, France</i>	
<i>Elena Cabrio, Université Côte d'Azur, France</i>	
<i>Serena Villata, Université Côte d'Azur, France</i>	

## Theme: AI and Agents

### KomIS - Knowledge Discovery meets Information Systems Track

**Track Co-Chairs:** *Fabio Mercurio, University of Milano-Bicocca, Italy*  
*Mario Mezzanatica, University of Milano-Bicocca, Italy*  
*Antonio Picariello, University of Naples "Federico II", Italy*

<b>Track Editorial</b> .....	1064
------------------------------	------

<b>An Effective and Efficient Algorithm for Ranking Web Documents via Genetic Programming</b> .....	1065
<i>Ricardo Baeza-Yates, Northeastern University at Silicon Valley, USA</i>	
<i>Alfredo Cuzzocrea, University of Trieste, Italy</i>	
<i>Domenico Crea, University of Calabria, Italy</i>	
<i>Giovanni Lo Bianco, University of Calabria, Italy</i>	

<b>How to Implement a Big Data Clustering Algorithm: A Brief Report on Lesson Learned</b> .....	1073
<i>Michele Ianni, University of Calabria, Italy</i>	
<i>Elio Masciari, ICAR-CNR, Italy</i>	
<i>Giuseppe M. Mazzeo, Facebook, USA</i>	
<i>Carlo Zaniolo, UCLA, USA</i>	

<b>On-line Aggregation of POIs from Google and Facebook</b> .....	1081
<i>Maurizio Toccu, University of Bergamo, Italy</i>	
<i>Giuseppe Psaila, University of Bergamo, Italy</i>	
<i>Davide Altomare, Enel SpA, Italy</i>	

<b>Topic-based Indexing of Federated Datasets</b> .....	1090
<i>Ciro Sorrentino, University of Sannio, Italy</i>	
<i>Ester Giallonardo, University of Sannio, Italy</i>	
<i>Eugenio Zimeo, University of Sannio, Italy</i>	

<b>VisCrimePredict: A System for Crime Trajectory Prediction and Visualisation from Heterogeneous Data Sources</b> .....	1099
<i>Ahsan Morshed, Swinburne University of Technology, Australia</i>	
<i>Abdur Rahim Mohammad Forkan, Swinburne University of Technology, Australia</i>	
<i>Pei-Wei Tsai, Swinburne University of Technology, Australia</i>	
<i>Prem Prakash Jayaraman, Swinburne University of Technology, Australia</i>	
<i>Timos Sellis, Swinburne University of Technology, Australia</i>	
<i>Dimitrios Georgakopoulos, Swinburne University of Technology, Australia</i>	
<i>Irene Moser, Swinburne University of Technology, Australia</i>	
<i>Rajiv Ranjan, Newcastle University, UK</i>	
 <b>Poster Papers</b>	
<b>A Deep Learning based Community Detection approach</b> .....	1107
<i>Giancarlo Sperli, University of Naples "Federico II", Italy</i>	
<b>Catfish Density Estimation by Aerial Images Analysis and Deep Learning</b> .....	1111
<i>Donatello Conte, University of Tours, France</i>	
<i>Pierre Gaucher, University of Tours, France</i>	
<i>Carlo Sansone, University of Naples Federico II, Italy</i>	
 <b>Theme: AI and Agents</b>	
<b>KRR - Knowledge Representation and Reasoning Track</b>	
<b>Track Co-Chairs:</b> <i>Stefano Bistarelli, Università di Perugia, Italy</i>	
<i>Martine Ceberio, University of Texas El Paso, USA</i>	
<i>Eric Monfroy, Universidad Técnica Federico Santa María, Valparaíso, Chile and</i>	
<i>Université de Nantes, France</i>	
<i>Francesco Santini, Università di Perugia, Italy</i>	
 <b>Track Editorial</b> .....	1115
<b>Conflict History based Search for Constraint Satisfaction Problem</b> .....	1117
<i>Djamal Habet, Aix Marseille University, LIS, France</i>	
<i>Cyril Terrioux, Aix Marseille University, LIS, France</i>	
<b>Expressive Cardinality Constraints on ALCSCC Concepts</b> .....	1123
<i>Franz Baader, Technische Universität Dresden, Germany</i>	
<b>Inferential Equivalence, Normal Forms, and Isomorphisms of Knowledge Bases in Institutions of Conditional Logics</b> .....	1131
<i>Christoph Beierle, FernUniversität in Hagen, Germany</i>	
<b>Interpretations and Models for Assumption-Based Argumentation</b> .....	1139
<i>Samy Sá, Universidade Federal do Ceará, Brazil</i>	
<i>João Alcântara, Universidade Federal do Ceará, Brazil</i>	
<b>On Scaling the Enumeration of the Preferred Extensions of Abstract Argumentation Frameworks</b> .....	1147
<i>Gianvincenzo Alfano, University of Calabria, Italy</i>	
<i>Sergio Greco, University of Calabria, Italy</i>	
<i>Francesco Parisi, University of Calabria, Italy</i>	

**Representing and Comparing Large Sets of Extensions of Abstract Argumentation Frameworks** ..... 1154  
*Odinaldo Rodrigues, King's College London, UK*

**Poster Papers**

**Hybrid Temporal Situation Calculus** ..... 1162  
*Vitaliy Batusov, York University, Canada*  
*Giuseppe De Giacomo, Sapienza Università di Roma, Italy*  
*Mikhail Soutchanski, Ryerson University, Canada*

**Student Research Abstract**

**Student Research Abstract: Automatic Derivation of Formulas by Graph Embedding and Pattern Matching Network** ..... 1165  
*MinCong Luo, China Institute of Atomic Energy, China*

**Student Research Abstract: Modelling the Dynamics of Forgetting and Remembering by a System of Belief Changes** ..... 1168  
*Kai Sauerwald, FernUniversität in Hagen, Germany*

**Theme: Distributed Systems**

**MCA - Mobile Computing and Applications Track**

**Track Co-Chairs:** *Hong Va Leong, The Hong Kong Polytechnic University, China*  
*Sheikh Iqbal Ahamed, Marquette University, USA*

**Track Editorial** ..... 1172

**A Multi-Objective Indoor Localization Service for Smartphones** ..... 1174  
*Andreas Konstantinidis, Frederick University, Cyprus*  
*Aphrodite Demetriades, Frederick University, Cyprus*  
*Savvas Pericleous, Frederick University, Cyprus*

**A Scalable and Accurate Feature Representation Method for Identifying Malicious Mobile Applications** ..... 1182  
*Bo Sun, National Institute of Information and Communications Technology, Japan*  
*Tao Ban, National Institute of Information and Communications Technology, Japan*  
*Shun-Chieh Chang, Institute for Information Industry, Taiwan*  
*Yeali S. Sun, National Taiwan University, Taiwan*  
*Takeshi Takahashi, National Institute of Information and Communications Technology, Japan*  
*Daisuke Inoue, National Institute of Information and Communications Technology, Japan*

**Acousess: Smartphone-based Logger to Assess Acoustical Conditions – Subjective Noise Conditions on some Circumference and Intraindividual Variation** ..... 1190  
*Takahiro Miura, AIST, Japan*  
*Mari Ueda, Kanagawa Institute of Technology, Japan*  
*Masaaki Hiroe, Kobayashi Institute of Physical Research, Japan*  
*Ken-ichiro Yabu, The University of Tokyo, Japan*

<b>Machine Learning for Improving Mobile User Satisfaction</b> .....	1200
<i>Ismat Chaib Draa, Université Polytechnique Hauts-de-France, France</i>	
<i>Fabien Bouquillon, Université Polytechnique Hauts-de-France, France</i>	
<i>Smail Niar, Université Polytechnique Hauts-de-France, France</i>	
<i>Emmanuelle Grislin-Le Strugeon, Université Polytechnique Hauts-de-France, France</i>	

<b>MoCA: A Novel Privacy-preserving Contextual Advertising Platform on Mobile Devices</b> .....	1208
<i>Jung-Hyun Lee, Korea University, South Korea</i>	
<i>Woo-Jong Ryu, Korea University, South Korea</i>	
<i>Kang-Min Kim, Korea University, South Korea</i>	
<i>SangKeun Lee, Korea University, South Korea</i>	

### **Poster Papers**

<b>Extended Sammon Projection and Wavelet Kernel Extreme Learning Machine for Gait-based Legitimate User Identification</b> .....	1216
<i>Muhammad Ahmad, Innopolis University, Russia</i>	
<i>Adil Mehmood Khan, Innopolis University, Russia</i>	
<i>Manuel Mazzara, Innopolis University, Russia</i>	
<i>Salvatore Distefano, University of Messina, Italy</i>	
<i>Amjad Ali, Korea University, South Korea</i>	
<i>Ali Tufail, Islamic University of Medina, Saudi Arabia</i>	

### **Student Research Abstract**

<b>Student Research Abstract: Smart Mobile Crowdsensing for Tinnitus Research</b> .....	1220
<i>Muntazir Mehdi, Ulm University, Germany</i>	

### **Theme: Distributed Systems**

#### **MiDOS - Microservices, DevOps, and Service-Oriented Architecture Track**

**Track Co-Chairs:** *Luís Cruz-Filipe, University of Southern Denmark, Denmark*  
*Elisabetta Di Nitto, Politecnico di Milano, Italy*  
*Jacopo Mauro, University of Southern Denmark, Denmark*

<b>Track Editorial</b> .....	1224
------------------------------	------

<b>An Extensible Data-Driven Approach for Evaluating the Quality of Microservice Architectures</b> .....	1225
<i>Mario Cardarelli, University of L'Aquila, Italy</i>	
<i>Ludovico Iovino, Gran Sasso Science Institute, Italy</i>	
<i>Paolo Di Francesco, Gran Sasso Science Institute, Italy</i>	
<i>Amleto Di Salle, University of L'Aquila, Italy</i>	
<i>Ivano Malavolta, Vrije Universiteit Amsterdam, The Netherlands</i>	
<i>Patricia Lago, Vrije Universiteit Amsterdam, The Netherlands</i>	

<b>Attack Graph Generation for Microservice Architecture</b> .....	1235
<i>Amjad Ibrahim, Technical University of Munich, Germany</i>	
<i>Stevica Bozhinoski, Technical University of Munich, Germany</i>	
<i>Alexander Pretschner, Technical University of Munich, Germany</i>	

**Reactive Microservices for the Internet of Things: A Case Study in Fog Computing** ..... 1243  
*Cleber Jorge Lira de Santana, Federal Institute of Bahia and Federal University of Bahia, Brazil*  
*Brenno de Mello Alencar, Federal University of Bahia, Brazil*  
*Cássio V. Serafim Prazeres, Federal University of Bahia,*

**Transparent Tracing of Microservice-based Applications** ..... 1252  
*Matheus Santana, Federal University of Pernambuco, Brazil*  
*Adalberto Sampaio Jr., Federal University of Pernambuco, Brazil*  
*Marcos Andrade, Federal University of Pernambuco, Brazil*  
*Nelson S. Rosa, Federal University of Pernambuco, Brazil*

### **Poster Papers**

**A Model-driven Workflow for Distributed Microservice Development** ..... 1260  
*Florian Rademacher, Dortmund University of Applied Sciences and Arts, Germany*  
*Jonas Sorgalla, Dortmund University of Applied Sciences and Arts, Germany*  
*Sabine Sachweh, Dortmund University of Applied Sciences and Arts, Germany*  
*Albert Zündorf, Universität Kassel, Germany*

### **Theme: AI and Agents**

#### **MLA - Machine Learning and its Applications Track**

**Track Co-Chairs:** *Keon Myung Lee, Chungbuk National University, South Korea*  
*Jee-Hyong Lee, Sungkyunkwan University, South Korea*

**An Adaptive Framework for Applying Machine Learning in Smart Spaces** ..... 1263  
*Sachin Bhardwaj, Chungbuk National University, South Korea*  
*Keon Myung Lee, Chungbuk National University, South Korea*  
*Jee-Hyong Lee, Sungkyunkwan University, South Korea*

**Causality Relationship Among Attributes Applied in an Educational Data Set** ..... 1271  
*Walisson Ferreira de Carvalho, Centro Universitário Una, Brazil*  
*Luis Enrique Zarate, Pontifical Catholic University of Minas Gerais, Brazil*

**Evolving MIMO Multi-Layered Artificial Neural Networks using Grammatical Evolution** ..... 1278  
*Qadeer Ahmad, Namal College, Pakistan*  
*Atif Rafiq, University of Limerick, Ireland*  
*Muhammad Adil Raja, University of Limerick, Ireland*  
*Noman Javed, Namal College, Pakistan*

**Exact Gaussian Process Regression with Distributed Computations** ..... 1286  
*Duc-Trung Nguyen, EURECOM, France*  
*Maurizio Filippone, EURECOM, France*  
*Pietro Michiardi, EURECOM, France*

**GAN is a Friend or Foe? A Framework to Detect Various Fake Face Images** ..... 1296  
*Shahroz Tariq, SUNY Korea, South Korea*  
*Sangyup Lee, SUNY Korea, South Korea*  
*Hoyoung Kim, SUNY Korea, South Korea*  
*Youjin Shin, SUNY Korea, South Korea*  
*Simon S. Woo, SUNY Korea, South Korea*

**How Do Implementation Bugs Affect the Results of Machine Learning Algorithms?** ..... 1304  
*Maurizio Leotta, Università di Genova, Italy*  
*Dario Olanas, Università di Genova, Italy*  
*Filippo Ricca, Università di Genova, Italy*  
*Nicoletta Noceti, Università di Genova, Italy*

**Influence Maximization for Effective Advertisement in Social Networks: Problem, Solution, and Evaluation** ..... 1314  
*Suk-Jin Hong, Hanyang University, South Korea*  
*Yun-Yong Ko, Hanyang University, South Korea*  
*Moonjeung Joe, Gyeongnam National University of Science and Technology, South Korea*  
*Sang-Wook Kim, Hanyang University, South Korea*

**Marlon – A Domain-Specific Language for Multi-Agent Reinforcement Learning on Networks** ..... 1322  
*Tim Molderez, Vrije Universiteit Brussel, Belgium*  
*Bjarno Oeyen, Vrije Universiteit Brussel, Belgium*  
*Coen De Roover, Vrije Universiteit Brussel, Belgium*  
*Wolfgang De Meuter, Vrije Universiteit Brussel, Belgium*

**Population Anomaly Detection through Deep Gaussianization** ..... 1330  
*David Tolpin, Offtopia, Israel*

**Real-Time Botnet Detection using Nonnegative Tucker Decomposition** ..... 1337  
*Hideaki Kanehara, Waseda University, Japan*  
*Yuma Murakami, Waseda University, Japan*  
*Jumpei Shimamura, Clwit Inc., Japan*  
*Takeshi Takahashi, National Institute of Information and Communications Technology, Japan*  
*Daisuke Inoue, National Institute of Information and Communications Technology, Japan*  
*Noboru Murata, Waseda University, Japan*

**Convolutional Neural Network with Structural Input for Visual Object Tracking** ..... 1345  
*Mustansar Fiaz, Kyungpook National University, South Korea*  
*Arif Mahmood, Information Technology University, Pakistan*  
*Soon Ki Jung, Kyungpook National University, South Korea*

### **Poster Papers**

**An Efficient Deep Learning Platform for Detecting Objects** ..... 1353  
*Hansol Lee, Soongsil University, South Korea*  
*Younggwon Kim, Soongsil University, South Korea*  
*Juw Won Park, University of Louisville, USA*  
*Sung Y. Shin, South Dakota University, USA*  
*Jiman Hong, Soongsil University, South Korea*

**Machine Learning based Real-Time Vehicle Data Analysis for Safe Driving Modeling** ..... 1355  
*Pamul Yadav, Ulsan National Institute of Science and Technology, South Korea*  
*Sangsu Jung, MtoV Inc., South Korea*  
*Dhananjay Singh, Hankuk University of Foreign Studies, South Korea*

**Multiple Perspectives HMM-based Feature Engineering for Credit Card Fraud Detection** ..... 1359

*Yvan Lucas, Universität Passau, Germany*

*Pierre-Edouard Portier, INSA Lyon, France*

*Léa Laporte, INSA Lyon, France*

*Sylvie Calabretto, INSA Lyon, France*

*Olivier Caelen, ATOS Worldline, France*

*Liyun He-Guelton, ATOS Worldline, France*

*Michael Granitzer, Universität Passau, Germany*

**Toward a Continuous Authentication System using a Biologically Inspired Machine Learning Approach: A Case Study** ..... 1362

*Obada Al Zoubi, American University of Beirut, Lebanon*

*Mariette Awad, American University of Beirut, Lebanon*

**Theme: Distributed Systems**

**NET - Networking Track**

**Track Co-Chairs:** *Mário M. Freire, University of Beira Interior, Portugal*

*Marília Curado, University of Coimbra, Portugal*

*Ivan Ganchev, University of Limerick, Ireland and*

*University of Plovdiv "Paisii Hilendarski", Bulgaria*

**A Hierarchical Architectural Model for Network Security Exploring Situational Awareness** ..... 1365

*Ricardo Borges Almeida, Federal University of Pelotas, Brazil*

*Victor Covalski, Federal University of Pelotas, Brazil*

*Roger Machado, Federal University of Pelotas, Brazil*

*Diórgenes Yuri Leal da Rosa, Federal University of Pelotas, Brazil*

*Adenauer Corrêa Yamin, Federal University of Pelotas, Brazil*

*Lucas Medeiros Donato, De Montfort University, UK*

*Ana Marilza Pernas, Federal University of Pelotas, Brazil*

**On Simplifying Congestion Window Handling for CMT-SCTP** ..... 1373

*Marcelo Ricardo Leitner, Technological Federal University of Paraná, Brazil*

*Mauro S.P. Fonseca, Technological Federal University of Paraná, Brazil*

*Anelise Munaretto, Technological Federal University of Paraná, Brazil*

**On the Analogy between Quantum Circuit Design Automation and Virtual Network Embedding** ..... 1378

*Andreas Fischer, Deggendorf Institute of Technology, Germany*

*Alexandru Paler, Linz Institute of Technology, Austria*

**Reducing Energy Consumption in SDN-based Data Center Networks through Flow Consolidation Strategies** ..... 1384

*Marcelo da Silva Conterato, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil*

*Tiago Coelho Ferreto, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil*

*Fábio Rossi, Federal Institute of Education, Science and Technology, Brazil*

*Wagner dos Santos Marques, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil*

*Paulo Silas Severo de Souza, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil*

## Poster Papers

<b>Implementing Content-based Publish/Subscribe with OpenFlow</b> .....	1392
<i>Helge Parzyjegl, Universität Rostock, Germany</i>	
<i>Christian Wernecke, Universität Rostock, Germany</i>	
<i>Gero Mühl, Universität Rostock, Germany</i>	
<i>Eike Schweissguth, Universität Rostock, Germany</i>	
<i>Dirk Timmermann, Universität Rostock, Germany</i>	

## Student Research Abstract

<b>Student Research Abstract: Extending LoRa Networks: Dynamic Routing Protocols and Sub-GHz Radio Technology for Very Long Range Mesh Networks</b> .....	1396
<i>Roger Pueyo Centelles, Universitat Politècnica de Catalunya, Spain</i>	

## Theme: System Software and Security

### NGPS - Next Generation Programming Paradigms and Systems Track

<b>Track Co-Chairs:</b>	<i>Davide Ancona, Università di Genova, Italy</i>
	<i>Frédéric Loulergue, Northern Arizona University, USA</i>
	<i>Mirko Viroli, Alma Mater Studiorum - Università di Bologna, Italy</i>
	<i>Danilo Pianini, Alma Mater Studiorum - Università di Bologna, Italy</i>

<b>Track Editorial</b> .....	1398
------------------------------	------

<b>Safe Usage of Registers in BSPlib</b> .....	1400
<i>Arvid Jakobsson, Huawei France Research Center, France</i>	
<i>Frédéric Dabrowski, University of Orléans, France</i>	
<i>Wadoud Bousdira, University of Orléans, France</i>	

## Theme: System Software and Security

### OS - Operating Systems Track

<b>Track Co-Chairs:</b>	<i>George Hamer, South Dakota State University, USA</i>
	<i>Bongjae Kim, Sun Moon Univeristy, South Korea</i>
	<i>Jaeheung Lee, Daejeon University, South Korea</i>

<b>A Solution for a Detailed Mathematical Model for the Aircraft Landing Problem on a Single and Multiple Runway System</b> .....	1408
<i>Meriem Ben Messaoud, University of Tunis, Tunisia</i>	
<i>Khaled Ghedira, University of Tunis, Tunisia</i>	

<b>Binary Transformation of Applications to run on Bare PCs</b> .....	1416
<i>Rasha Almajed, Towson University, USA</i>	
<i>Ramesh Karne, Towson University, USA</i>	
<i>Alexander Wijesinha, Towson University, USA</i>	

<b>Cache-Aware Block Allocation for Memory-Technology Storage Targeted File Systems</b> .....	1424
<i>Jaeheong Ahn, University of Seoul, South Korea</i>	
<i>Choulseung Hyun, University of Seoul, South Korea</i>	
<i>Donghee Lee, University of Seoul, South Korea</i>	
<i>Sam H. Noh, Ulsan National Institute of Science and Technology, South Korea</i>	

<b>A Robust and Secure Backup System for Protecting Malware</b> .....	1432
<i>Myungjoon Shon, Soongsil University, South Korea</i>	
<i>Heejin Kim, Soongsil University, South Korea</i>	
<i>Kicheol Park, Soongsil University, South Korea</i>	
<i>Juw Won Park, University of Louisville, USA</i>	
<i>Kwanghee Won, South Dakota State University, USA</i>	
<i>Jiman Hong, Soongsil University, South Korea</i>	
<b>HPanal: A Framework for Analyzing Tradeoffs of Huge Pages</b> .....	1438
<i>Gunhee Choi, Dankook University, South Korea</i>	
<i>Juhyung Son, Dankook University, South Korea</i>	
<i>Jongmoo Choi, Dankook University, South Korea</i>	
<i>Seong-je Cho, Dankook University, South Korea</i>	
<i>Youjip Won, KAIST, South Korea</i>	
<b>Multithreaded Double Queuing for Balanced CPU-GPU Memory Copying</b> .....	1444
<i>Sanghun Cho, Sungkyunkwan University, South Korea</i>	
<i>Jaewan Hong, Sungkyunkwan University, South Korea</i>	
<i>Jungsik Choi, Sungkyunkwan University, South Korea</i>	
<i>Hwansoo Han, Sungkyunkwan University, South Korea</i>	
<b>My Cloudy Time Machine: A Scalable Microservice-based Platform for Data Processing in Cloud-Edge Systems – A Proof of Concept for the ROBIN-Cloud Project</b> .....	1451
<i>Darius-Florentin Neatu, University Politecnica of Bucharest, Romania</i>	
<i>Radu-Dumitru Stochitoiu, University Politehnica of Bucharest, Romania</i>	
<i>Andrei-Vlad Postoaca, University Politehnica of Bucharest, Romania</i>	
<i>Ion-Dorinel Filip, University Politehnica of Bucharest, Romania</i>	
<i>Florin Pop, University Politehnica of Bucharest, Romania</i>	
<b>Poster Papers</b>	
<b>A Rendezvous Node Selection Protocol for Drone-based Data Collection</b> .....	1459
<i>Hong Min, Hoseo University, South Korea</i>	
<i>Kwangsoo Jo, Hoseo University, South Korea</i>	
<i>Jinman Jung, Hannam University, South Korea</i>	
<i>Bongjae Kim, Sun Moon University, South Korea</i>	
<i>Junyoung Heo, Hansung University, South Korea</i>	
<b>Predicting 24-hours Ahead Photovoltaic Power Output using Forecast Information</b> .....	1462
<i>Jaehyun Kim, Korea Electronics Technology Institute, South Korea</i>	
<i>Taehyoung Kim, Korea Electronics Technology Institute, South Korea</i>	
<i>Jieun Lee, Korea Electronics Technology Institute, South Korea</i>	
<i>Kyung Sun Ham, Korea Electronics Technology Institute, South Korea</i>	

**Theme: System Software and Security**

**PDP - Privacy by Design in Practice Track**

**Track Co-Chairs:** *Ronald Petric, Federal Commissioner for Data Protection and  
Freedom of Information, Germany  
Christoph Sorge, Saarland University, Germany*

**Track Editorial** ..... 1465

**Dynamic Attribute-Based Privacy-Preserving Genomic Susceptibility Testing** ..... 1467

*Mina Namazi, University of Vigo, Spain  
Cihan Eryonucu, Bilkent University, Turkey  
Erman Ayday, Bilkent University, Turkey  
Fernando Pérez-González, University of Vigo, Spain*

**Engineering Privacy by Design – Lessons from the Design and Implementation of an Identity  
Wallet Platform** ..... 1475

*Fatbardh Veseli, Capgemini, Germany  
Jetzabel Serna Olvera, Goethe University Frankfurt, Germany  
Tobias Pulls, Karlstad University, Sweden  
Kai Rannenber, Goethe University Frankfurt, Germany*

**Mind Your Wallet's Privacy: Identifying Bitcoin Wallet Apps and User's Actions through  
Network Traffic Analysis** ..... 1484

*Fabio Aioli, University of Padua, Italy  
Mauro Conti, University of Padua, Italy  
Ankit Gangwal, University of Padua, Italy  
Mirko Polato, University of Padua, Italy*

**Privacy-Enhanced System Design Modeling based on Privacy Features** ..... 1492

*Amir Shayan Ahmadian, University of Koblenz Landau, Germany  
Daniel Strüber, University of Koblenz Landau, Germany  
Jan Jürjens, University of Koblenz Landau, Germany*

**Recommender-based Privacy Requirements Elicitation – EPICUREAN: An Approach to Simplify  
Privacy Settings in IoT Applications with Respect to the GDPR** ..... 1500

*Christoph Stach, University of Stuttgart, Germany  
Frank Steimle, University of Stuttgart, Germany*

**Poster Papers**

**AILocker: Authenticated Image Locker for Video** ..... 1508

*Jihye Kim, Kookmin University, South Korea  
Hanyung Ko, Hanyang University, South Korea  
Hyunok Oh, Hanyang University, South Korea*

**A Comparison of System Description Models for Data Protection by Design** ..... 1512

*Pierre Dewitte, KU Leuven, Belgium  
Kim Wuyts, KU Leuven, Belgium  
Laurens Sion, KU Leuven, Belgium  
Dimitri Van Landuyt, KU Leuven, Belgium  
Ivo Emanuilov, KU Leuven, Belgium  
Peggy Valcke, KU Leuven, Belgium  
Wouter Joosen, KU Leuven, Belgium*

**Theme: System Software and Security**

**PL - Programming Languages Track**

**Track Co-Chairs:** Barrett R. Bryant, *University of North Texas, USA*  
Rajeev Raje, *Indiana University-Purdue University-Indianapolis, USA*

**Track Editorial** ..... 1516

**An Attribute Language Definition for Adaptable Parsing Expression Grammars** ..... 1518

*Elton M. Cardoso, Universidade Federal de Ouro Preto, Brazil*  
*Rodrigo G. Ribeiro, Universidade Federal de Ouro Preto, Brazil*  
*Leonardo V.S. Reis, Universidade Federal de Juiz de Fora, Brazil*  
*Mariza A.S. Bigonha, Universidade Federal de Minas Gerais, Brazil*  
*Roberto S. Bigonha, Universidade Federal de Minas Gerais, Brazil*  
*Vladimir O. Di Iorio, Universidade Federal de Viçosa, Brazil*

**CPEG: A Typed Tree Construction from Parsing Expression Grammars with Regex-Like Captures** ..... 1526

*Daisuke Yamaguchi, Yokohama National University, Japan*  
*Kimio Kuramitsu, Japan Women's University, Japan*

**Musket: A Domain-Specific Language for High-Level Parallel Programming with Algorithmic Skeletons** ..... 1534

*Christoph Rieger, University of Münster, Germany*  
*Fabian Wrede, University of Münster, Germany*  
*Herbert Kuchen, University of Münster, Germany*

**PureMEM: A Structured Programming Model for Transiently Powered Computers** ..... 1544

*Caglar Durmaz, Ege University, Turkey*  
*Kasim Sinan Yildirim, Ege University, Turkey*  
*Geylani Kardas, Ege University, Turkey*

**Retrieval of Individual Solutions from Encapsulated Search with a Potentially Infinite Search Space** ..... 1552

*Jan C. Dageförde, University of Münster, Germany*  
*Herbert Kuchen, University of Münster, Germany*

**$\pi$ : Towards a Simple Formal Semantic Framework for Compiler Construction** ..... 1562

*Christiano Braga, Universidade Federal Fluminense, Brazil*

**Poster Papers**

**Applying a Data-centric framework for Developing Model Transformations** ..... 1570

*Luiz Carlos Camargo, Federal University of Paraná, Brazil*  
*Marcos Didonet Del Fabro, Federal University of Paraná, Brazil*

**Fyr: A Memory-safe and Thread-safe Systems Programming Language** ..... 1574

*Torben Weis, University of Duisburg-Essen, Germany*  
*Marian Waltereit, University of Duisburg-Essen, Germany*  
*Maximilian Uphoff, University of Duisburg-Essen, Germany*

**Parallel Programming with Coq: Map and Reduce Skeletons on Trees** ..... 1578

*Jolan Philippe, Northern Arizona University, USA*  
*Frédéric Loulergue, Northern Arizona University, USA*

## **Theme: Software Design and Development**

### **RE - Requirements Engineering Track**

**Track Co-Chairs:** *Maria Lencastre, Universidade de Pernambuco, Brazil*  
*João Araújo, NOVA LINCS, Universidade Nova de Lisboa, Portugal*

**Track Editorial** ..... 1582

**ARRoW: Automatic Runtime Reappraisal of Weights for Self-Adaptation** ..... 1584

*Luis H. Garcia Paucar, Aston University, UK*  
*Nelly Bencomo, Aston University, UK*  
*Kevin Kam Fung Yuen, Singapore University of Social Sciences, Singapore*

**Contemporary Requirements Challenges and Issues: An Empirical Study in 11 Organizations** ..... 1592

*Feng Chen, National Institute of Informatics, Japan*  
*Norah Power, University of Limerick, Ireland*  
*J.J. Collins, University of Limerick, Ireland*  
*Fuyuki Ishikawa, National Institute of Informatics, Japan*

**Goal Modeling for Collaborative Groups of Cyber-Physical Systems with GRL: Reflections on Applicability and Limitations based on Two Studies Conducted in Industry** ..... 1600

*Marian Daun, University of Duisburg-Essen, Germany*  
*Viktoria Stenkova, University of Duisburg-Essen, Germany*  
*Lisa Krajinski, University of Duisburg-Essen, Germany*  
*Jennifer Brings, University of Duisburg-Essen, Germany*  
*Torsten Bandyszak, University of Duisburg-Essen, Germany*  
*Thorsten Weyer, University of Duisburg-Essen, Germany*

**Logic-based Methodology to Help Security Architects in Eliciting High-Level Network Security Requirements** ..... 1610

*Romain Laborde, University Paul Sabatier, France*  
*Sravani Teja Bulusu, University Paul Sabatier, France*  
*Ahmad Samer Wazan, University Paul Sabatier, France*  
*Francois Barrere, University Paul Sabatier, France*  
*Abdelmalek Benzekri, University Paul Sabatier, France*

**Requirements for Preventing Logic Flaws in the Authentication Procedure of Web Applications** ..... 1620

*Youssou Ndiaye, University Rennes, France*  
*Oliver Barais, University Rennes, France*  
*Arnaud Blouin, University Rennes, France*  
*Ahmed Bouabdallah, IMT Atlantique, France*  
*Nicolas Aillery, Orange, France*

### **Poster Papers**

**Elicitation of Technical Requirements in Large Research Projects: The CERBERO Approach** ..... 1629

*M. Masin, IBM, Israel*  
*F. Palumbo, Università degli Studi di Sassari, Italy*  
*J. Adriaanse, TNO, The Netherlands*  
*H. Myrhaug, Ambiesense, UK*  
*F. Regazzoni, Università della Svizzera Italiana, Switzerland*  
*M. Sanchez, Thales Alenia Space, Spain*  
*K. Zedda, Abinsula, Italy*

## ***Student Research Abstract***

<b>Student Research Abstract: SRCMIMM: Managing Requirements Change Activities in Global Software Development</b> .....	1633
<i>Muhammad Azeem Akbar, Chongqing University, China</i>	

### ***Theme: System Software and Security***

#### **RS - Recommender Systems: Theory and Applications Track**

**Track Co-Chairs:**     *Markus Zanker, Free University of Bozen-Bolzano, Italy*  
                              *Li Chen, Hong Kong Baptist University, China*  
                              *Panagiotis Symeonidis, Free University of Bozen-Bolzano, Italy*  
                              *Yong Zheng, Illinois Institute of Technology, USA*

<b>Track Editorial</b> .....	1637
------------------------------	------

<b>Community-Aware Diversification of Recommendations</b> .....	1639
---	------

*Mesut Kaya, University College Cork, Ireland*  
*Derek Bridge, University College Cork, Ireland*

<b>Global versus Individual Accuracy in Contextual Multi-Armed Bandit</b> .....	1647
---	------

*Nicolas Gutowski, ERIS, ESEO-TECH, France*  
*Tassadit Amghar, Université d'Angers - LERIA, France*  
*Olivier Camp, ERIS, ESEO-TECH, France*  
*Fabien Chhel, ERIS, ESEO-TECH, France*

<b>Matrix Factorization based Heuristics for Constraint-based Recommenders</b> .....	1655
--	------

*Seda Polat Erdeniz, Graz University of Technology, Austria*  
*Alexander Felfernig, Graz University of Technology, Austria*  
*Ralph Samer, Graz University of Technology, Austria*  
*Muesluem Atas, Graz University of Technology, Austria*

<b>Top-N Group Recommendations with Fairness</b> .....	1663
--	------

*Dimitris Sacharidis, Technische Universität Wien, Austria*

<b>Towards Explaining Recommendations through Local Surrogate Models</b> .....	1671
--	------

*Caio Nóbrega, Federal University of Campina Grande, Brazil*  
*Leandro Marinho, Federal University of Campina Grande, Brazil*

### ***Poster Papers***

<b>CoRE: A Cold-start Resistant and Extensible Recommender System</b> .....	1679
---	------

*Mostafa Bayomi, Trinity College Dublin, Ireland*  
*Annalina Caputo, Trinity College Dublin, Ireland*  
*Matthew Nicholson, Trinity College Dublin, Ireland*  
*Anirban Chakraborty, Trinity College Dublin, Ireland*  
*Sèamus Lawless, Trinity College Dublin, Ireland*

<b>Preselection of Documents for Personalized Recommendations of Job Postings based on Word Embeddings</b> .....	1683
<i>Steffen Schnitzer, Technische Universität Darmstadt, Germany</i>	
<i>Dominik Reis, Technische Universität Darmstadt, Germany</i>	
<i>Wael Alkhatib, Technische Universität Darmstadt, Germany</i>	
<i>Christoph Rensing, Technische Universität Darmstadt, Germany</i>	
<i>Ralf Steinmetz, Technische Universität Darmstadt, Germany</i>	
<b>The Influence of Trust Cues on the Trustworthiness of Online Reviews for Recommendations</b> .....	1687
<i>Catalin-Mihai Barbu, University of Duisburg-Essen, Germany</i>	
<i>Guillermo Carbonell, University of Duisburg-Essen, Germany</i>	
<i>Jürgen Ziegler, University of Duisburg-Essen, Germany</i>	
<b>Theme: Software Design and Development</b>	
<b>SATTA - Software Architecture: Theory, Technology, and Applications Track</b>	
<b>Track Co-Chairs:</b> <i>Marcello M. Bersani, Politecnico di Milano, Italy</i>	
<i>Sungwon Kang, Korea Advanced Institute of Science and Technology, South Korea</i>	
<i>Patrizia Scandurra, DIGIP, University of Bergamo, Italy</i>	
<b>Track Editorial</b> .....	1690
<b>A RESTful Architecture for Data Exploration as a Service</b> .....	1692
<i>Yun Zhang, University of New South Wales, Australia</i>	
<i>Xiwei Xu, University of New South Wales, Australia</i>	
<i>Suhrid Satyal, University of New South Wales, Australia</i>	
<i>Shiping Chen, University of New South Wales, Australia</i>	
<i>Liming Zhu, University of New South Wales, Australia</i>	
<b>Aiding the Realization of Service-oriented Distributed Systems</b> .....	1701
<i>Marco Autili, University of L'Aquila, Italy</i>	
<i>Amleto Di Salle, University of L'Aquila, Italy</i>	
<i>Francesco Gallo, University of L'Aquila, Italy</i>	
<i>Claudio Pompilio, University of L'Aquila, Italy</i>	
<i>Massimo Tivoli, University of L'Aquila, Italy</i>	
<b>An Exploratory Study of MVC-based Architectural Patterns in Android Apps</b> .....	1711
<i>Aymen Daoudi, Université du Québec à Montréal, Canada</i>	
<i>Ghizlane ElBoussaidi, École de Technologie Supérieure, Canada</i>	
<i>Naouel Moha, Université du Québec à Montréal, Canada</i>	
<i>Sègla Kpodjedo, École de Technologie Supérieure, Canada</i>	
<b>JCaliper: Search-Based Technical Debt Management</b> .....	1721
<i>Panagiotis Kouros, University of Macedonia, Greece</i>	
<i>Theodore Chaikalis, University of Macedonia, Greece</i>	
<i>Elvira-Maria Arvanitou, University of Macedonia, Greece</i>	
<i>Alexander Chatzigeorgiou, University of Macedonia, Greece</i>	
<i>Apostolos Ampatzoglou, University of Macedonia, Greece</i>	
<i>Theodoros Amanatidis, University of Macedonia, Greece</i>	

<b>The Effect of Gamification on Software Architecture Knowledge Management: A Student Experiment and Focus Group Study</b> .....	1731
<i>Benjamin Mayer, Johannes Kepler University, Austria</i> <i>Rainer Weinreich, Johannes Kepler University, Austria</i>	
<b>Theme: Software Design and Development</b>	
<b>SE - Software Engineering Track</b>	
<b>Track Co-Chairs:</b> <i>Tao Zhang, Harbin Engineering University, China</i> <i>Byungjeong Lee, University of Seoul, South Korea</i> <i>Eunjee Song, Baylor University, USA</i>	
<b>Track Editorial</b> .....	1741
<b>A Model-Driven Approach for Behavior-Driven GUI Testing</b> .....	1742
<i>Hendrik Bänder, itemis AG, Germany</i> <i>Herbert Kuchen, University of Münster, Germany</i>	
<b>A Novel Approach to Automatic Query Reformulation for IR-based Bug Localization</b> .....	1752
<i>Misoo Kim, Sungkyunkwan University, South Korea</i> <i>Eunseok Lee, Sungkyunkwan University, South Korea</i>	
<b>On the Classification of Software Change Messages using Multi-label Active Learning</b> .....	1760
<i>Cyrine Gharbi, Higher Institute of Management of Sousse, Tunisia</i> <i>Mohamed Wiem Mkaouer, Rochester Institute of Technology, USA</i> <i>Ilyes Jenhani, Prince Mohammad Bin Fahd University, Saudi Arabia</i> <i>Montassar Ben Messaoud, Higher Institute of Management of Tunis, Tunisia</i>	
<b>JUniVerse: Large-scale JUnit-Test Analysis in the Wild</b> .....	1768
<i>Omar Javed, Università della Svizzera Italiana, Switzerland</i> <i>Alex Villazón, Universidad Privada Boliviana, Bolivia</i> <i>Walter Binder, Università della Svizzera Italiana, Switzerland</i>	
<b>Live and Global Consistency Checking in a Collaborative Engineering Environment</b> .....	1776
<i>Michael Alexander Tröls, Johannes Kepler University, Austria</i> <i>Atif Mashkooor, Johannes Kepler University, Austria</i> <i>Alexander Egyed, Johannes Kepler University, Austria</i>	
<b>MarValous: Machine Learning based Detection of Emotions in the Valence-Arousal Space in Software Engineering Text</b> .....	1786
<i>Md Rakibul Islam, University of New Orleans, USA</i> <i>Md Kauser Ahmmed, University of New Orleans, USA</i> <i>Minhaz F. Zibran, University of New Orleans, USA</i>	
<b>NodeMOP: Runtime Verification for Node.js Applications</b> .....	1794
<i>Filippo Schiavio, Università della Svizzera Italiana, Switzerland</i> <i>Haiyang Sun, Università della Svizzera Italiana, Switzerland</i> <i>Daniele Bonetta, Oracle, USA</i> <i>Andrea Rosà, Università della Svizzera Italiana, Switzerland</i> <i>Walter Binder, Università della Svizzera Italiana, Switzerland</i>	
<b>Parallel Property Checking with Staged Symbolic Execution</b> .....	1802
<i>Junye Wen, Texas State University, USA</i> <i>Guowei Yang, Texas State University, USA</i>	

<b>Revisiting Continuous Deployment Maturity: A Two-Year Perspective</b> .....	1810
<i>Simo Mäkinen, University of Helsinki, Finland</i>	
<i>Timo Lehtonen, Solita Ltd, Finland</i>	
<i>Terhi Kilamo, Tampere University of Technology, Finland</i>	
<i>Mikko Puonti, Solita Ltd, Finland</i>	
<i>Tommi Mikkonen, University of Helsinki, Finland</i>	
<i>Tomi Männistö, University of Helsinki, Finland</i>	
<b>Runtime Observable and Adaptable UML State Machines: Models@run.time Approach</b> .....	1818
<i>Miren Illarramendi, Mondragon Unibertsitatea, Spain</i>	
<i>Leire Etxeberria, Mondragon Unibertsitatea, Spain</i>	
<i>Xabier Elkorobarrutia, Mondragon Unibertsitatea, Spain</i>	
<i>Goiuria Sagardui, Mondragon Unibertsitatea, Spain</i>	
<b>A Case Study of Systematic Top-down Design of Cyber-physical Models with Integrated Validation and Formal Verification</b> .....	1828
<i>Christoph Luckeneder, Technische Universität Wien, Austria</i>	
<i>Hermann Kaindl, Technische Universität Wien, Austria</i>	
<b>Toward a Declarative Language to Generate Explorable Sets of Models</b> .....	1837
<i>Théo Le Calvar, Université d'Angers - LERIA, France</i>	
<i>Fabien Chhel, ERIS, ESEO-TECH, France</i>	
<i>Frédéric Jouault, ERIS, ESEO-TECH, France</i>	
<i>Frédéric Saubion, Université d'Angers - LERIA, France</i>	
<b>Usability Evaluation of VR products in Industry – A Systematic Literature Review</b> .....	1845
<i>Sai Anirudh Karre, International Institute of Information Technology Hyderabad, India</i>	
<i>Neeraj Mathur, International Institute of Information Technology Hyderabad, India</i>	
<i>Y. Raghu Reddy, International Institute of Information Technology Hyderabad, India</i>	
<b>Using Design Sprint as a Facilitator in Active Learning for Students in the Requirements Engineering Course: An Experience Report</b> .....	1852
<i>Vinicius Gomes Ferreira, University of Brasília, Brazil</i>	
<i>Edna Dias Canedo, University of Brasília, Brazil</i>	
<b>Poster Papers</b>	
<b>Classifying Software Issue Reports through Association Mining</b> .....	1860
<i>Mohd Syafiq Zolkeply, Cardiff University, UK</i>	
<i>Jianhua Shao, Cardiff University, UK</i>	
<b>Mining Constraints for Monitoring Systems of Systems</b> .....	1864
<i>Thomas Krismayer, Johannes Kepler University, Austria</i>	
<i>Rick Rabiser, Johannes Kepler University, Austria</i>	
<i>Paul Grünbacher, Johannes Kepler University, Austria</i>	
<b>Privacy Preserving 2-party Queries on Bipartite Graphs with Private Set Intersection</b> .....	1867
<i>Sara Ramezani, University of Helsinki, Finland</i>	
<i>Tommi Meskanen, University of Helsinki, Finland</i>	
<i>Valtteri Niemi, University of Helsinki, Finland</i>	
<b>Synthesising Call Sequences from OCL Operational Contracts</b> .....	1871
<i>Hao Wu, Maynooth University, Ireland</i>	

<b>TestLocal: Just-In-Time Parametrized Testing of Local Variables</b> .....	1874
<i>Marcel Heimlich, Texas Tech University, USA</i>	
<i>Akbar Siami Namin, Texas Tech University, USA</i>	
<b>Towards a Requirements Language for Modeling Emotion in Videogames</b> .....	1878
<i>Gonçalo Miguéis, FCT/UNL, Portugal</i>	
<i>João Araujo, FCT/UNL, Portugal</i>	
<i>Ana Moreira, FCT/UNL, Portugal</i>	
<b>VeriCCM: Improving the Syntax and Semantics of Requirements Models</b> .....	1881
<i>Danielle Gaither, University of North Texas, USA</i>	
<i>Kaushik Madala, University of North Texas, USA</i>	
<i>Hyunsook Do, University of North Texas, USA</i>	
<i>Barrett R. Bryant, University of North Texas, USA</i>	
<b>Student Research Abstract</b>	
<b>Student Research Abstract: Empirical Study on Developer’s Perception regarding Reward Practices</b> .....	1885
<i>Hina Gul Afridi, IQRA National University, Pakistan</i>	
<b>Theme: System Software and Security</b>	
<b>SEC - Computer Security Track</b>	
<b>Track Co-Chairs:</b>	<i>Giampaolo Bella, Università di Catania, Italy</i>
	<i>Rosario Giustolisi, IT University of Copenhagen, Denmark</i>
<b>Track Editorial</b> .....	1888
<b>A Coarse-Grained Password Model with Memorable Unit-Based Recurrent Neural Networks</b> .....	1890
<i>Rui Xu, Chinese Academy of Sciences, China</i>	
<i>Xiaojun Chen, Chinese Academy of Sciences, China</i>	
<i>Jinqiao Shi, Chinese Academy of Sciences, China</i>	
<b>A Real-Time Remote IDS Testbed for Connected Vehicles</b> .....	1898
<i>Valentin Zieglmeier, Technical University of Munich, Germany</i>	
<i>Severin Kacianka, Technical University of Munich, Germany</i>	
<i>Thomas Hutzelmann, Technical University of Munich, Germany</i>	
<i>Alexander Pretschner, Technical University of Munich, Germany</i>	
<b>Coauthentication</b> .....	1906
<i>Jay Ligatti, University of South Florida, USA</i>	
<i>Cagri Cetin, University of South Florida, USA</i>	
<i>Shamaria Engram, University of South Florida, USA</i>	
<i>Jean-Baptiste Subils, University of South Florida, USA</i>	
<i>Dmitry Goldgof, University of South Florida, USA</i>	
<b>Detection of Algorithmically Generated Domain Names used by Botnets: A Dual Arms Race</b> .....	1916
<i>Jan Spooren, KU Leuven, Belgium</i>	
<i>Davy Preuveneers, KU Leuven, Belgium</i>	
<i>Lieven Desmet, KU Leuven, Belgium</i>	
<i>Peter Janssen, , Belgium</i>	
<i>Wouter Joosen, KU Leuven, Belgium</i>	

<b>Enabling Change-Driven Workflows in Continuous Information Security Management</b> .....	1924
<i>Michael Brunner, University of Innsbruck, Austria</i>	
<i>Andrea Mussmann, University of Innsbruck, Austria</i>	
<i>Ruth Breu, University of Innsbruck, Austria</i>	
<b>Secure Multi-Execution in Android</b> .....	1934
<i>Dhiman Chakraborty, Saarland University, Germany</i>	
<i>Christian Hammer, University of Potsdam, Germany</i>	
<i>Sven Bugiel, CISPA – Helmholtz Center for Information Security, Germany</i>	
<b>Spectre without Shared Memory</b> .....	1944
<i>Ben Amos, Ben-Gurion University of the Negev, Israel</i>	
<i>Niv Gilboa, Ben-Gurion University of the Negev, Israel</i>	
<i>Arbel Levy, Ben-Gurion University of the Negev, Israel</i>	
<b>Static Security Evaluation of an Industrial Web Application</b> .....	1952
<i>Gebrehiwet B. Welearegai, University of Potsdam, Germany</i>	
<i>Max Schlueter, University of Potsdam, Germany</i>	
<i>Christian Hammer, University of Potsdam, Germany</i>	
<b>The ROP Needle: Hiding Trigger-based Injection Vectors via Code Reuse</b> .....	1962
<i>Pietro Borrello, Sapienza University of Rome, Italy</i>	
<i>Emilio Coppa, Sapienza University of Rome, Italy</i>	
<i>Daniele Cono D'Elia, Sapienza University of Rome, Italy</i>	
<i>Camil Demetrescu, Sapienza University of Rome, Italy</i>	
<b>Towards Automated Network Mitigation Analysis</b> .....	1971
<i>Patrick Speicher, Saarland University, Germany</i>	
<i>Marcel Steinmetz, Saarland University, Germany</i>	
<i>Jörg Hoffmann, Saarland University, Germany</i>	
<i>Michael Backes, Saarland University, Germany</i>	
<i>Robert Künnemann, Saarland University, Germany</i>	
<b><i>Student Research Abstract</i></b>	
<b>Student Research Abstract: ``Hard to Understand, Easy to Ignore'': An Automated Approach to Predict Mobile App Permission Requests</b> .....	1979
<i>Majid Hatamian, Goethe University Frankfurt, Germany</i>	
<b>Student Research Abstract: Digital Forensics in the Internet of Things</b> .....	1983
<i>Monina Schwarz, Universität Hamburg, Germany</i>	

**Theme: Information Systems**

**SFECS - Sustainability of Fog/Edge Computing Systems Track**

**Track Co-Chairs:** *Christian Esposito, University of Napoli "Federico II", Italy*  
*Florin Pop, University POLITEHNICA of Bucharest, and National Institute of*  
*Research and Development in Informatics, Romania*  
*Chang Choi, Chosun University, South Korea*

**Track Editorial** ..... 1986

**Evaluation of ACE Properties of Traditional SQL and NoSQL Big Data Systems** ..... 1988

*Maria Teresa Gonzalez-Aparicio, University of Oviedo, Spain*  
*Muhammad Younas, Oxford Brookes University, UK*  
*Javier Tuya, University of Oviedo, Spain*  
*Rubén Casado, Accenture Digital, Spain*

**Fog Computing as the Key for Seamless Connectivity Handover in Future Vehicular Networks** ..... 1996

*Maria Rita Palattella, Luxembourg Institute of Science and Technology, Luxembourg*  
*Ridha Soua, University of Luxembourg, Luxembourg*  
*Abdelmajid Khelil, Landshut University of Applied Science, Germany*  
*Thomas Engel, University of Luxembourg, Luxembourg*

**Resource-Sharing Optimization for Multicast D2D Communications Underlying LTE-A Uplink Cellular Networks** ..... 2001

*Devarani Devi Ningombam, Chosun University, South Korea*  
*Seokjoo Shin, Chosun University, South Korea*

**Towards a Seamless Coordination of Cloud and Fog: Illustration through the Internet-of-Things** ..... 2008

*Zakaria Maamar, Zayed University, UAE*  
*Thar Baker, Liverpool John Moores University, UK*  
*Noura Faci, Université Lyon 1, France*  
*Emir Ugljanin, State University of Novi Pazar, Serbia*  
*Mohammed Al Khafajiy, Liverpool John Moores University, UK*  
*Vanilson Burégio, Federal Rural University of Pernambuco, Brazil*

**Word2Vec based Spelling Correction Method of Twitter Message** ..... 2016

*Jeongin Kim, Chosun University, South Korea*  
*Taekeun Hong, Chosun University, South Korea*  
*Pankoo Kim, Chosun University, South Korea*

**Theme: System Software and Security**

**SiSoS - Software-intensive Systems-of-Systems Track**

**Track Co-Chairs:** *Flavio Oquendo, IRISA - UMR CNRS – Univ. Bretagne Sud, France*  
*Khalil Drira, LAAS - CNRS – Univ. Toulouse, France*  
*Axel Legay, Université catholique de Louvain, Belgium*  
*Thais Vasconcelos Batista, DIMAp – UFRN, Brazil*

**Track Editorial** ..... 2020

**Constructing Product-Line Safety Cases from Contract-Based Specifications** ..... 2022

*Damir Nešić, Royal Institute of Technology, Sweden*  
*Mattias Nyberg, Royal Institute of Technology, Sweden*  
*Barbara Gallina, Mälardalen University, Sweden*

**Towards a Fractionation-based Verification: Application on SysML Activity Diagrams** ..... 2032

*Samir Ouchani, LINEACT/CESI, France*

**Poster Papers**

**The Preliminary Results of a Mapping Study of Deployment and Orchestration for IoT** ..... 2040

*Phu H. Nguyen, SINTEF, Norway*

*Nicolas Ferry, SINTEF, Norway*

*Gencer Erdogan, SINTEF, Norway*

*Hui Song, SINTEF, Norway*

*Stéphane Lavirotte, Université Côte d'Azur, France*

*Jean-Yves Tigli, Université Côte d'Azur, France*

*Arnor Solberg, TelluIoT, Norway*

**Data-Driven Environment Modeling for Adaptive System-of-Systems** ..... 2044

*Yong-Jun Shin, Korea Advanced Institute of Science and Technology, South Korea*

*Young-Min Baek, Korea Advanced Institute of Science and Technology, South Korea*

*Eunkyoung Jee, Korea Advanced Institute of Science and Technology, South Korea*

*Doo-Hwan Bae, Korea Advanced Institute of Science and Technology, South Korea*

**Theme: Information Systems**

**SONAMA - Social Network and Media Analysis Track**

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

**Track Editorial** ..... 2048

**A Computationally Efficient Multi-modal Classification Approach of Disaster-related Twitter Images** ..... 2050

*Yara Rizk, American University of Beirut, Lebanon*

*Hadi Samer Jomaa, American University of Beirut, Lebanon*

*Mariette Awad, American University of Beirut, Lebanon*

*Carlos Castillo, Universitat Pompeu Fabra, Brazil*

**Brand Community Analysis on Social Networks using Graph Representation Learning** ..... 2060

*Marco Brambilla, Politecnico di Milano, Italy*

*Mattia Gasparini, Politecnico di Milano, Italy*

**Collaboration Profiles and their Impact on Musical Success** ..... 2070

*Mariana O. Silva, Universidade Federal de Minas Gerais, Brazil*

*Lais M. Rocha, Universidade Federal de Minas Gerais, Brazil*

*Mirella M. Moro, Universidade Federal de Minas Gerais, Brazil*

**Community Evolution Prediction in Dynamic Social Networks using Community Features' Change Rates** ..... 2078

*Narimene Dakiche, École Nationale Supérieure d'Informatique, Algeria*

*Fatima Benbouzid-Si Tayeb, École Nationale Supérieure d'Informatique, Algeria*

*Yahya Slimani, Manouba University, Tunisia*

*Karima Benatchba, École Nationale Supérieure d'Informatique, Algeria*

**Event Detection for Exploring Emotional Upheavals of Depressive People** ..... 2086

*PinHua Wu, National Tsing Hua University, Taiwan*

*JiaLing Koh, National Taiwan Normal University, Taiwan*

*Arbee L.P. Chen, Asia University, Taiwan*

<b>Identification of Credulous Users on Twitter</b> .....	2096
<i>Alessandro Balestrucci, Gran Sasso Science Institute, Italy</i>	
<i>Rocco De Nicola, IMT School for Advanced Studies, Italy</i>	
<i>Omar Inverso, Gran Sasso Science Institute, Italy</i>	
<i>Catia Trubiani, Gran Sasso Science Institute, Italy</i>	
<b>KidsGUARD: Fine Grained Approach for Child Unsafe Video Representation and Detection</b> .....	2104
<i>Shubham Singh, Indraprastha Institute of Information Technology Delhi, India</i>	
<i>Rishabh Kaushal, Indraprastha Institute of Information Technology Delhi, India</i>	
<i>Arun Balaji Buduru, Indraprastha Institute of Information Technology Delhi, India</i>	
<i>Ponnurangam Kumaraguru, Indraprastha Institute of Information Technology Delhi, India</i>	
<b>Multidimensional Analysis of Hot Events from Social Media Sources</b> .....	2112
<i>Abir Troudi, University of Sfax, Tunisia</i>	
<i>Salma Jamoussi, University of Sfax, Tunisia</i>	
<i>Corinne Amel Zayani, University of Sfax, Tunisia</i>	
<i>Ikram Amous, University of Sfax, Tunisia</i>	
<b>Poster Papers</b>	
<b>A Tool for Spatio-Temporal Analysis of Social Anxiety with Twitter Data</b> .....	2120
<i>Joohong Lee, Hanyang University, South Korea</i>	
<i>Dongyoung Sohn, Hanyang University, South Korea</i>	
<i>Yong Suk Choi, Hanyang University, South Korea</i>	
<b>Evaluating Neural Word Embeddings Created from Online Course Reviews for Sentiment Analysis</b> ....	2124
<i>Danilo Dessì, University of Cagliari, Italy</i>	
<i>Mauro Dragoni, Fondazione Bruno Kessler, Italy</i>	
<i>Gianni Fenu, University of Cagliari, Italy</i>	
<i>Mirko Marras, University of Cagliari, Italy</i>	
<i>Diego Reforgiato Recupero, University of Cagliari, Italy</i>	
<b>Knapsack-based Reverse Influence Maximization for Target Marketing in Social Networks</b> .....	2128
<i>Ashis Talukder, Kyung Hee University, South Korea</i>	
<i>Choong Seon Hong, Kyung Hee University, South Korea</i>	
<b>Predicting Event Attendance exploring Social Influence</b> .....	2131
<i>Fatemeh Salehi Rizi, University of Passau, Germany</i>	
<i>Michael Granitzer, University of Passau, Germany</i>	
<b>Semantic Analysis for Paraphrase Identification using Semantic Role Labeling</b> .....	2135
<i>Eunji Lee, Chosun University, South Korea</i>	
<i>Htet Myet Lynn, Chosun University, South Korea</i>	
<i>HyoungJu Kim, Chosun University, South Korea</i>	
<i>Soonja Yeom, University of Tasmania, Australia</i>	
<i>Pankoo Kim, Chosun University, South Korea</i>	

**Theme: System Software and Security**

**SP - Software Platforms Track**

**Track Co-Chairs:** *Jinman Jung, Hannam University, South Korea*  
*Jun Huang, Chongqing University of Posts and Telecom, China*

**Track Editorial** ..... 2139

**Analysis of Application Installation Logs on Android Systems** ..... 2140

*Jinwoo Lee, Soongsil University, South Korea*  
*Yena Lee, Soongsil University, South Korea*  
*Ming Jin, Soongsil University, South Korea*  
*John Kim, Utica College, USA*  
*Jiman Hong, Soongsil University, South Korea*

**Design and Implementation of Emulab-based Malware Analysis Service through EmuLib** ..... 2146

*Gibeom Song, Hannam University, South Korea*  
*Manhee Lee, Hannam University, South Korea*

**Energy Efficient IO stack Design for Wearable Device** ..... 2152

*Junghoon Kim, Samsung Electronics, South Korea*  
*Sundoo Kim, Hanyang University, South Korea*  
*Juseong Yun, Hanyang University, South Korea*  
*Youjip Won, KAIST, South Korea*

**Poster Papers**

**A Design and Implementation Wind Farm Real-time Simulator with Various Types of Wind Turbines considering Wake Effect** ..... 2160

*Taehyoung Kim, Korea Electronics Technology Institute, South Korea*  
*Jaehyun Kim, Korea Electronics Technology Institute, South Korea*  
*Jieun Lee, Korea Electronics Technology Institute, South Korea*  
*Kyung Sun Ham, Korea Electronics Technology Institute, South Korea*

**A Novel Approach for Collecting and Sharing Software Metrics Data** ..... 2164

*Ilya Khomyakov, Innopolis University, Russia*  
*Alberto Sillitti, Innopolis University, Russia*

**Theme: Software Design and Development**

**SVT - Software Verification and Testing Track**

**Track Co-Chairs:** *Matthias Guedemann, Diffblue Ltd., UK*  
*Leonardo Mariani, University of Milano Bicocca, Italy*

**Bounded Invariance Checking of Simulink Models** ..... 2168

*Predrag Filipovikj, Mälardalen University, Sweden*  
*Guillermo Rodriguez-Navas, Mälardalen University, Sweden*  
*Cristina Seceleanu, Mälardalen University, Sweden*

**Dynamic Symbolic Execution for the Analysis of Web Server Applications in Java** ..... 2178

*Daniel Balasubramanian, Vanderbilt University, USA*  
*Zhenkai Zhang, Vanderbilt University, USA*  
*Dan McDermet, Vanderbilt University, USA*  
*Gabor Karsai, Vanderbilt University, USA*

<b>Logic against Ghosts: Comparison of Two Proof Approaches for a List Module</b> .....	2186
<i>Allan Blanchard, Inria Lille - Nord Europe, France</i>	
<i>Nikolai Kosmatov, CEA LIST, France</i>	
<i>Frédéric Loulergue, Northern Arizona University, USA</i>	
<b>Matching Implementations to Specifications: The Corner Cases of ioco</b> .....	2196
<i>Ramon Janssen, Radboud University, The Netherlands</i>	
<i>Jan Tretmans, Radboud University, The Netherlands</i>	
<b>Specification of Temporal Properties of Functions for Runtime Verification</b> .....	2206
<i>Joshua Heneage Dawes, University of Manchester and CERN, UK</i>	
<i>Giles Regeer, University of Manchester, UK</i>	
<b>Statically Analyzing Information Flows – An Abstract Interpretation-based Hyperanalysis for Non-Interference</b> .....	2215
<i>Isabella Mastroeni, University of Verona, Italy</i>	
<i>Michele Pasqua, University of Verona, Italy</i>	
<b>Study of Trivial Compiler Equivalence on C++ Object-Oriented Mutation Operators</b> .....	2224
<i>Pedro Delgado-Pérez, Universidad de Cádiz, Spain</i>	
<i>Sergio Segura, Universidad de Sevilla, Spain</i>	
<b>Verification-based Test Case Generation for Information-Flow Properties</b> .....	2231
<i>Mihai Herda, Karlsruhe Institute of Technology, Germany</i>	
<i>Shmuel Tyszberowicz, Southwest University, China</i>	
<i>Joachim Müssig, Karlsruhe Institute of Technology, Germany</i>	
<i>Bernhard Beckert, Karlsruhe Institute of Technology, Germany</i>	
<b>Theme: Information Systems</b>	
<b>SWA - Semantic Web and Applications Track</b>	
<b>Track Co-Chairs:</b> <i>Soon Ae Chun, City University of New York, USA</i>	
<i>Hyoil Han, Illinois State University, USA</i>	
<i>Sangsoo Sung, Google Inc., USA</i>	
<b>Track Editorial</b> .....	2239
<b>Embedding Cardinality Constraints on Neural Link Predictors</b> .....	2243
<i>Emir Muñoz, National University of Ireland Galway, Ireland</i>	
<i>Pasquale Minervini, University College London, UK</i>	
<i>Matthias Nickles, National University of Ireland Galway, Ireland</i>	
<b>Exploiting Context and Quality for Linked Data Source Selection</b> .....	2251
<i>Barbara Catania, Università di Genova, Italy</i>	
<i>Giovanna Guerrini, Università di Genova, Italy</i>	
<i>Beyza Yaman, Università di Genova, Italy</i>	

<b>GeoSensor: Semantifying Change and Event Detection over Big Data</b> .....	2259
<i>Nikiforos Pittaras, NCSR "Demokritos" and University of Athens, Greece</i>	
<i>George Papadakis, University of Athens, Greece</i>	
<i>George Stamoulis, University of Athens, Greece</i>	
<i>Giorgos Argyriou, University of Athens, Greece</i>	
<i>Efi Karra Taniskidou, University of Athens, Greece</i>	
<i>Emmanouil Thanos, University of Athens, Greece</i>	
<i>George Giannakopoulos, NCSR "Demokritos", Greece</i>	
<i>Manolis Koubarakis, University of Athens, Greece</i>	
 <b>How Many and What Types of SPARQL Queries can be Answered through Zero-Knowledge Link Traversal?</b> .....	2267
<i>Pavlos Fafalios, Leibniz University of Hanover, Germany</i>	
<i>Yannis Tzitzikas, FORTH-ICS, Greece</i>	
 <b>Improving the Performance of Querying Multidimensional RDF Data using Aggregates</b> .....	2275
<i>Franck Ravat, Institut de Recherche en Informatique de Toulouse, France</i>	
<i>Jiefu Song, Institut de Recherche en Informatique de Toulouse, France</i>	
<i>Olivier Teste, Institut de Recherche en Informatique de Toulouse, France</i>	
<i>Cassia Trojahn, Institut de Recherche en Informatique de Toulouse, France</i>	
 <b>Partitioning and Local Matching Learning of Large Biomedical Ontologies</b> .....	2285
<i>Amir Laadhar, Toulouse Institute of Computer Science Research, France</i>	
<i>Faiza Ghazzi, University of Sfax, Tunisia</i>	
<i>Imen Megdiche, Toulouse Institute of Computer Science Research, France</i>	
<i>Franck Ravat, Toulouse Institute of Computer Science Research, France</i>	
<i>Olivier Teste, Toulouse Institute of Computer Science Research, France</i>	
<i>Faiez Gargouri, University of Sfax, Tunisia</i>	
 <b>Semi-Automatic Ontology-Driven Development Documentation – Generating Documents from RDF Data and DITA Templates</b> .....	2293
<i>Yevgen Pikus, Fraunhofer ISST, Germany</i>	
<i>Norbert Weissenberg, Fraunhofer ISST, Germany</i>	
<i>Bernhard Holtkamp, Fraunhofer ISST, Germany</i>	
<i>Boris Otto, Fraunhofer ISST, Germany</i>	
 <b>Using Contemporary Constraints to Ensure Data Consistency</b> .....	2303
<i>David Abián, University of Zaragoza, Spain</i>	
<i>Jorge Bernad, University of Zaragoza, Spain</i>	
<i>Raquel Trillo-Lado, University of Zaragoza, Spain</i>	
 <b>Poster Papers</b>	
 <b>A Tool for Exploring Networks of Computer Scientists as a Graph</b> .....	2240
<i>Mirko Cesarini, University of Milano-Bicocca, Italy</i>	
<i>Fabio Mercorio, University of Milano-Bicocca, Italy</i>	
<i>Mario Mezzanzanica, University of Milano-Bicocca, Italy</i>	
<i>Vincenzo Moscato, University of Naples Federico II, Italy</i>	
<i>Antonio Picariello, University of Naples Federico II, Italy</i>	

<b>The Scientific Events Ontology of the OpenResearch.org Curation Platform</b> .....	2311
<i>Said Fathalla, Universität Bonn and Alexandria University, Germany</i>	
<i>Sahar Vahdati, Universität Bonn, Germany</i>	
<i>Sören Auer, Leibniz University of Hannover and TIB Leibniz Information Center for Science and Technology, Germany</i>	
<i>Christoph Lange, Universität Bonn and Fraunhofer IAIS, Germany</i>	

**Student Research Abstract**

<b>Student Research Abstract: User's Profile Ontology-Based Semantic Model for Personalized Hotel Room Recommendation in the Web of Things</b> .....	2314
<i>Ronald Ojino, University of Dar es Salaam, Tanzania</i>	

**Theme: Software Design and Development**

**UE - Usability Engineering Track**

**Track Co-Chairs:** *Eduardo Mosqueira Rey, University of A Coruña, Spain*  
*Vicente Moret Bonillo, University of A Coruña, Spain*  
*David Alonso Ríos, University of A Coruña, Spain*

<b>Track Editorial</b> .....	2317
------------------------------	------

<b>Cognitive Workload of In-Car Auditory-Vocal Interfaces on Visuospatial Sketchpad based on a Dual Task of Visual Pattern Test</b> .....	2319
---	------

*Takahiro Miura, AIST and The University of Tokyo, Japan*  
*Ken-ichiro Yabu, The University of Tokyo, Japan*  
*Youji Shimizu, Nissan Motor Corporation, Japan*  
*Kenichi Tanaka, Nissan Motor Corporation, Japan*  
*Masamitsu Furukawa, Nissan Motor Corporation, Japan*  
*Seiko Michiyoshi, Nissan Motor Corporation, Japan*  
*Tetsuya Yamamoto, Nissan Motor Corporation, Japan*  
*Kazutaka Ueda, The University of Tokyo, Japan*  
*Tohru Ifukube, The University of Tokyo, Japan*

<b>Usability Problems Discovery based on the Automatic Detection of Usability Smells</b> .....	2328
--	------

*Rafael Fontinele Ribeiro, Universidade Federal do Piauí, Brazil*  
*Matheus de Meneses Campanhã Souza, Universidade Federal do Piauí, Brazil*  
*Pedro Almir Martins de Oliveira, Instituto Federal do Maranhão, Brazil*  
*Pedro de Alcântara dos Santos Neto, Universidade Federal do Piauí, Brazil*

**Poster Papers**

<b>Developing a Mental Model for use in the Context of Computer Security</b> .....	2336
--	------

*Isaiah Liljestrand, New Mexico Tech, USA*  
*Marcelo Gonzales, Colorado School of Mines, USA*  
*Dongwan Shin, New Mexico Tech, USA*

<b>User Experience Evaluation Focused on Viewpoints and Embodiment</b> .....	2340
--	------

*Cristina Scheibler, Universidade de Fortaleza, Brazil*  
*Maria Andréia Formico Rodrigues, Universidade de Fortaleza, Brazil*

**Theme: Software Design and Development**

**VSPLE - Variability and Software Product Line Engineering Track**

**Track Co-Chairs:** *Abdelhak-Djamel Seriai, University of Montpellier, France*  
*Tewfik Ziadi, University Pierre et Marie Curie, France*

**A Generic Traceability Metamodel for Enabling Unified End-to-End Traceability in Software Product Lines** ..... 2344

*Philipp Heisig, Dortmund University of Applied Sciences and Arts, Germany*  
*Jan-Philipp Steghöfer, University of Gothenburg, Sweden*  
*Christopher Brink, Miele & Cie. KG, Germany*  
*Sabine Sachweh, Dortmund University of Applied Sciences and Arts, Germany*

**Evaluating Variability at the Software Architecture Level: An Overview** ..... 2354

*Ana Paula Allian, University of São Paulo, Brazil*  
*Bruno Sena, University of São Paulo, Brazil*  
*Elisa Yumi Nakagawa, University of São Paulo, Brazil*

**Test Case Selection using Structural Coverage in Software Product Lines for Time-Budget Constrained Scenarios** ..... 2362

*Urtzi Markiegi, Mondragon Unibertsitatea, Spain*  
*Aitor Arrieta, Mondragon Unibertsitatea, Spain*  
*Leire Etxeberria, Mondragon Unibertsitatea, Spain*  
*Goiuria Sagardui, Mondragon Unibertsitatea, Spain*

**Poster Papers**

**Towards Variant Management and Change Impact Analysis in Safety-oriented Process-Product Lines** ..... 2372

*Muhammad Atif Javed, Mälardalen University, Sweden*  
*Barbara Gallina, Mälardalen University, Sweden*  
*Anna Carlsson, OHB Sweden, Sweden*

**Theme: Distributed Systems**

**WCN - Selected Areas of Wireless Communications and Networking Track**

**Track Co-Chairs:** *Dongkyun Kim, Kyungpook National University, South Korea*  
*Wei Wang, San Diego State University, USA*

**Track Editorial** ..... 2376

**A Matching based Coexistence Mechanism between eMBB and uRLLC in 5G Wireless Networks** ..... 2377

*Anupam Kumar Bairagi, Kyung Hee University, South Korea*  
*Md. Shirajum Munir, Kyung Hee University, South Korea*  
*Madyan Alsenwi, Kyung Hee University, South Korea*  
*Nguyen H. Tran, The University of Sydney, Australia*  
*Choong Seon Hong, Kyung Hee University, South Korea*

**A New CoAP Congestion Control Scheme using Message Loss Feedback for IoUT** ..... 2385

*Minseok Kim, Kyungpook National University, South Korea*  
*Sungwon Lee, Kyungpook National University, South Korea*  
*Muhammad Toaha Raza Khan, Kyungpook National University, South Korea*  
*Junho Seo, Kyungpook National University, South Korea*  
*Yeongjoon Bae, Kyungpook National University, South Korea*  
*Yonghwan Jeong, Kyungpook National University, South Korea*  
*Dongkyun Kim, Kyungpook National University, South Korea*

**An Adaptive Energy Efficient Scheme for Energy Constrained Wireless Sensor Networks** ..... 2391

*Bilal Jan, FATA University, Pakistan*  
*Haleem Farman, Islamia College Peshawar, Pakistan*  
*Murad Khan, Sarhad University of Science & Technology, Pakistan*  
*Syed Hassan Ahmed, Georgia Southern University, USA*

**Energy-Aware Medium Access Control for Energy-Harvesting Machine-to-Machine Networks** ..... 2399

*Dohyung Kim, Kangwon National University, South Korea*  
*Youngbae Ko, Ajou University, South Korea*

**On the Feasibility of using IEEE 802.11ad mmWave for Accurate Object Detection** ..... 2406

*Hossein Ajorloo, University College Cork, Ireland*  
*Cormac J. Sreenan, University College Cork, Ireland*  
*Adrian Loch, IMDEA Networks Institute, Spain*  
*Joerg Widmer, IMDEA Networks Institute, Spain*

**Reliability of ADS-B Communications: Novel Insights based on an Experimental Assessment** ..... 2414

*Savio Sciancalepore, Hamad Bin Khalifa University, Qatar*  
*Saeif Alhazbi, Hamad Bin Khalifa University, Qatar*  
*Roberto Di Pietro, Hamad Bin Khalifa University, Qatar*

**SoftH: Soft Handover Multicriteria Mechanism** ..... 2422

*Guilherme R.M. de Oliveira, Pontifical Catholic University of Minas Gerais, Brazil*  
*Carlos Renato Storck, Centro Federal de Educação Tecnológica de Minas Gerais, Brazil*  
*Fátima Duarte-Figueiredo, Pontifical Catholic University of Minas Gerais, Brazil*

**Poster Papers**

**A New Fuzzy/Evidential Approach to Address the Area Coverage Problem in Mobile Wireless Sensor Networks** ..... 2430

*Adda Boualem, Ecole Nationale Supérieure d'informatique, Algeria*  
*Youcef Dahmani, Ibn Khaldoun University, Algeria*  
*Marwane Ayaida, CReSTIC, University of Reims Champagne-Ardenne, France*  
*Cyril de Runz, CReSTIC, University of Reims Champagne-Ardenne, France*

**Theme: Information Systems**

**WICE - Web-based Technologies for Interactive Computing Education Track**

**Track Co-Chairs:** *Maiga Chang, Athabasca University, Canada*  
*Hasan Jamil, University of Idaho, USA*

**Track Editorial** ..... 2434

**A Web-Based E-Assessment Tool for Design Patterns in UML Class Diagrams** ..... 2435

*Tobias Reischmann, University of Münster, Germany*  
*Herbert Kuchen, University of Münster, Germany*

**Anchoring Interactive Points of Interest on Web-based Instructional Video: Effects on Students' Interaction Behavior and Perceived Experience** ..... 2445

*Maria da Graça C. Pimentel, University of São Paulo, Brazil*  
*Cristiane A. Yaguinuma, Federal Institute of São Paulo, Brazil*  
*Diogo S. Martins, Federal University of ABC, Brazil*  
*Isabela Zaine, University of São Paulo, Brazil*

**Integrating Context-Awareness and Multi-Criteria Decision Making in Educational Learning** ..... 2453

*Yong Zheng, Illinois Institute of Technology, USA*  
*Shephalika Shekhar, Illinois Institute of Technology, USA*  
*Alisha Anna Jose, Illinois Institute of Technology, USA*  
*Sunil Kumar Rai, Illinois Institute of Technology, USA*

**Meet Cyrus – The Query by Voice Mobile Assistant for the Tutoring and Formative Assessment of SQL Learners** ..... 2461

*Josue Espinosa Godinez, University of Idaho, USA*  
*Hasan M. Jamil, University of Idaho, USA*

**Poster Papers**

**Resources for Healthcare Workflow Modeling and Analysis** ..... 2469

*Hossain Shahriar, Kennesaw State University, USA*  
*Chi Zhang, Kennesaw State University, USA*  
*Md Arabin Islam Talukder, Kennesaw State University, USA*  
*Sheikh Iqbal Ahamed, Marquette University, USA*

**More than the Sum of its Parts: Designing Learning Formats from Core Components** ..... 2473

*Niels Heller, Ludwig Maximilian University of Munich, Germany*  
*Sebastian Mader, Ludwig Maximilian University of Munich, Germany*  
*François Bry, Ludwig Maximilian University of Munich, Germany*

**Theme: Distributed Systems**

**WT - Web Technologies Track**

**Track Co-Chairs:** *Francesco Poggi, University of Bologna, Italy*  
*Cristian Mateos, UNICEN University - Tandil, Argentina*  
*Tim A. Majchrzak, University of Agder - Kristiansand, Norway*

**Track Editorial** ..... 2477

**A Literature Review of Studies on Interactive 3D Information Visualization for the Web** ..... 2479

*Luiz S.S. Baglie, São Paulo State University, Brazil*  
*Diego R.C. Dias, Federal University of São João Del Rei, Brazil*  
*Marcelo P. Guimarães, Federal University of São Paulo, Brazil*  
*José R.F. Brega, São Paulo State University, Brazil*

**ALDONA: A Hybrid Solution for Sentence-Level Aspect-Based Sentiment Analysis using a Lexicalised Domain Ontology and a Neural Attention Model** ..... 2489

*Donatas Meškelė, Erasmus University Rotterdam, The Netherlands*  
*Flavius Frasinca, Erasmus University Rotterdam, The Netherlands*

**Mind the Cache: Large-Scale Explorative Study of Web Caching** ..... 2497

*Huai Viet Nguyen, Cologne University of Applied Sciences, Germany*  
*Luigi Lo Iacono, Cologne University of Applied Sciences, Germany*  
*Hannes Federrath, University of Hamburg, Germany*

**Standards-driven Metamodel to Increase Retrievability of Heterogeneous Services** ..... 2507

*Martin Garriga, National University of Comahue, Argentina*  
*Andrés Flores, National University of Comahue, Argentina*

**AwaitViz: A Visualizer of JavaScript's async/await Execution Order** ..... 2515

*Ena Tominaga, Tokyo Institute of Technology, Japan*  
*Yoshitaka Arahori, Tokyo Institute of Technology, Japan*  
*Katsuhiko Gondow, Tokyo Institute of Technology, Japan*

**Poster Papers**

**Context-Aware Recommendations via Sequential Predictions** ..... 2525

*Yong Zheng, Illinois Institute of Technology, USA*  
*Alisha Anna Jose, Illinois Institute of Technology, USA*

**Utility-Based Multi-Criteria Recommender Systems** ..... 2529

*Yong Zheng, Illinois Institute of Technology, USA*

**Computational Thinking with the Web Crowd using CodeMapper** ..... 2532

*Patrick Vanvorce, University of Idaho, USA*  
*Hasan M. Jamil, University of Idaho, USA*