Table of Contents

Message from SOCA 2018 General and Program Chairs ................................................................. x
Organizing Committee ......................................................................................................................... xi
Program Committee .............................................................................................................................. xii

SOCA Session 1: Distributed Services and Infrastructure

Microservice Design Space Analysis and Decision Documentation: A Case Study on API Management ................................................................................................................1
Stefan Haselböck (Johannes Kepler University Linz), Rainer Weinreich (Johannes Kepler University Linz), Georg Buchgeher (Software Competence Center Hagenberg), and Thomas Kriechbaum (Raiffeisen Software GmbH)

An Architecture for Dynamic Context Recognition in an Autonomous Driving Testing Environment ......................................................................................................................... 9
Elif Eryılmaz (Technische Universität Berlin), Frank Trollmann (Technische Universität Berlin), and Sahin Albayrak (Technische Universität Berlin)

A Privacy Enhanced Crowdsourcing Architecture for Road Information Mining Using Smartphones ......................................................................................................................... 17
Christian Roth (University of Regensburg) and Doan Kesdoan (University of Regensburg)

ContAv: A Tool to Assess Availability of Container-Based Systems ................................................. 25
Stefano Sebastio (INRIA), Rahul Ghosh (American Express Big Data Labs), Avantika Gupta (Conduent Labs, India), and Tridib Mukherjee (Data Science, Play Games 24x7)

Reducing Marketplace Response Time by Scoring Workers .............................................................. 33
Inessa Ainbinder (Azrieli College of Engineering, Jerusalem (JCE)), Miriam Allalouf (Azrieli College of Engineering, Jerusalem (JCE)), Natan Braslavski (Azrieli College of Engineering, Jerusalem (JCE)), and Hodaya Mahdizada (Azrieli College of Engineering, Jerusalem (JCE))
SOCA Session 2: Resource and Network Management I

A Unified Framework for 5G Network Management Tools ................................................................. 41
Jukka K. Nurminen (VTT Technical Research Centre, Espoo, Finland and Aalto University) and Harrison Mfula (Nokia Networks, Karaportti, Espoo)

A Resource Usage Prediction System Using Functional-Link and Genetic Algorithm Neural Network for Multivariate Cloud Metrics ........................................................................... 49
Thieu Nguyen (Hanoi University of Science and Technology), Nhuan Tran (Hanoi University of Science and Technology), Binh Minh Nguyen (Hanoi University of Science and Technology), and Giang Nguyen (Slovak Academy of Sciences)

Data-Aware Web Service Recommender System for Energy-Efficient Data Mining Services ............ 57
Zainab Al-zanbouri (Ryerson University) and Chen Ding (Ryerson University)

Data Replication Based on Common Interests in P2P Social Networks ........................................... 65
Anna Kobusinska (Poznan University of Technology), Michal Boron (Poznan University of Technology), Beata Szturemska (Poznan University of Technology), and Yue-Shan Chang (National Taipei University)

SOCA Session 3: Resource and Network Management II

Modeling and Automated Deployment of Serverless Applications Using TOSCA .............................. 73
Michael Wurster (University of Stuttgart), Uwe Breitenbücher (University of Stuttgart), Kálmán Képes (University of Stuttgart), Frank Leymann (University of Stuttgart), and Vladimir Yussupov (University of Stuttgart)

Proactive Content Caching Strategy with Router Reassignment in Content Centric Networks Based SDN ......................................................................................................................... 81
Amna Fekih (ISITCom, Tunisia), Sonia Gaied (ESST, Tunisia), and Habib Youssef (University Campus of Manouba, Tunisia)

Video Streaming Forwarding in a Smart City's VANET ........................................................................ 88
Emna Bouzid Smida (University of Sousse), Sonia Gaied Fantar (University of Sousse), and Habib Youssef (University of Sousse)

[WIP] A Workflow and Cloud Based Service-Oriented Architecture for Distributed Manufacturing in Industry 4.0 Context .................................................................................. 96
Kerem Kayabay (Middle East Technical University), Mert Onuralp Gökalp (Middle East Technical University), P. Erhan Eren (Middle East Technical University), and Altan Koçyiit (Middle East Technical University)

[WIP] Predictive Maintenance in Healthcare Services with Big Data Technologies .......................... 101
Selin Çoban (Middle East Technical University), Mert Onuralp Gökalp (Middle East Technical University), Ebru Gökalp (Middle East Technical University), P. Erhan Eren (Middle East Technical University), and Altan Koçyiit (Middle East Technical University)
SOCA Session 4: Internet of Things Applications

ArPico: Using Pictures to Build Localization Service for Indoor IoT Applications ........................................ 113
Yu Meng (Northeastern University, China), Kwei-Jay Lin (University of California, Irvine), Bingnan Peng (Northeastern University, China), Bolun Tsai (University of California, Irvine), and Chih-Sheng Shih (National Taiwan University)

Kubernetes or OpenShift? Which Technology Best Suits Eclipse Hono IoT Deployments ..................... 121
Mohab Aly (Polytechnique Montreal), Foutse Khomh (Polytechnique Montreal), and Soumaya Yacout (Polytechnique Montreal)

An IoT Middleware of Data Service .................................................................................................................. 129
Yu Wu (Fudan University) and Minbo Li (Fudan University)

An IoT-Based Automation System for Older Homes: A Use Case for Lighting System .......................... 137
Naser Hossein Motlagh (Aalto University), Siavash Haghighat Khajavi (Aalto University), Alireza Jaribion (Aalto University), and Jan Holmström (Aalto University)

[WiP] A Framework for Access Coordination in IoT ...................................................................................... 143
Oscar Novo (Aalto University, Ericsson Research)

SOCA Session 5: Service Composition and Design I

An Expert Interview Study on Areas of Microservice Design .......................................................................... 151
Stefan Haselböck (Johannes Kepler University Linz), Rainer Weinreich (Johannes Kepler University Linz), and Georg Buchgeher (Software Competence Center Hagenberg)

Using Osmotic Services Composition for Dynamic Load Balancing of Smart City Applications ........ 159
Arthur Souza (Federal University of Rio Grande do Norte, Natal, Brazil), Zhenyu Wen (Newcastle University, Newcastle upon Tyne, UK), Nelio Cacho (Federal University of Rio Grande do Norte, Natal, Brazil), Alexander Romanovsky (Newcastle University, Newcastle upon Tyne, UK), Philip James (Newcastle University, Newcastle upon Tyne, UK), and Rajiv Ranjan (Newcastle University, Newcastle upon Tyne, UK)

Nonstationary Concurrent Service Feature Identification Algorithm ........................................................... 167
Jun Guo (Northeastern University, Shenyang, China), Ying Tian (Northeastern University, Shenyang, China), Xinyue Wang (Northeastern University, Shenyang, China), Jun Na (Northeastern University, Shenyang, China), Bin Zhang (Northeastern University, Shenyang, China), and Wenjuan Sun (Shenyang Ligong University, Shenyang, China)

A Formal Approach for Cloud Composite Services Verification ................................................................. 175
Aida Lahouij (PRINCE Research Unit ISITCOM), Lazhar Hamel (ISIMM), Mohamed Graiet (ENSAI), and Mohammed El Malki (ENSAI)
Virtual Machine Integrity Verification in Crowd-Resourcing Virtual Laboratory ........................................... 183
Johannes Harungguan Sianipar (Hasso Plattner Institut), Christian Willems (Hasso Plattner Institut), and Christoph Meinel (Hasso Plattner Institut)

SOCA Session 6: Service Composition and Design II

Certified Information Flow Analysis of Service Implementations ............................................................. 191
Thomas S. Heinze (German Aerospace Center (DLR)) and Jasmin Türker (Friedrich Schiller University Jena)

Trace-Based Verification of Rule-Based Service Choreographies ....................................................... 199
Sotiris Moschoyiannis (University of Surrey), Leandros Maglaras (De Montfort University), and Nurulhuda A. Manaf (National Defence University of Malaysia)

PREDICAT: A Semantic Service-Oriented Platform for Data Interoperability and Linking in Earth Observation and Disaster Prediction .................................................. 208
Maroua Masmoudi (ENIT, Tarbes, France; University of Manouba), Hela Taktak (Sfax University, Tunisia; University of Lyon), Sana Ben Abdallah Ben Lamine (Riadi Laboratory, University of Manouba), khouloud Boukadi (Sfax University), Mohamed Hedi Karray (ENIT, Tarbes, France), Hajer Baazaoui Zghal (Riadi Laboratory, University of Manouba), Bernard Archimede (ENIT, Tarbes, France), Michael Mrissa (InnoRenew CoE, Slovenia; FAMNIT, University of Primorska), and Chirine Ghedira Guegan (University of Lyon 3)

Policy-Based Compliance Control Within Inter-Organizational Service Integration Platforms ........ 216
Laura González (Instituto de Computación, Facultad de Ingeniería, Universidad de la República) and Raúl Ruggia (Instituto de Computación, Facultad de Ingeniería, Universidad de la República)

SOCA Session 7: Big Data Modelling and IoT Applications

[WIP] Web Services Classification Using an Improved Text Mining Technique ................................. 224
Sidra Shafi (CEME NUST) and Usman Qamar (CEME NUST)

[WIP] IoT Blockchain Technologies for Smart Sensors Based on Raspberry Pi .............................. 230
Victor Román (Universidad Politécnica de Madrid) and Joaquin Ordiz-Meré (Universidad Politécnica de Madrid)

[WIP] A Novel Method for Big Data Analytics and Summarization Based on Fuzzy Similarity Measure .............................................................................................................. 235
Alireza Jaribion (Aalto University), Siavash H. Khajavi (Aalto University), Naser Hossein Motlagh (Aalto University), and Jan Holmström (Aalto University)

Ikram Garfatta (University of Monastir), Kais Klai (University Paris 13), Mohamed Graiet (ISIM-Monastir), and Walid Gaaloul (Mines Télécom-Télécom SudParis)
[WiP] HTU: An Efficient Hash-Trie Data Structure for URL Matching for Programmable Web Resources ........................................................................................................................................................................ 247

Igneta Dsouza (Ziroh Labs), Hrishikesh Dewan (Indian Institute of Science), Prashant Singh (Ziroh Labs), and Ramesh Hansdah (Indian Institute of Science)

Author Index ......................................................................................................................................................................................... 253