# 2014 IEEE 7th International Conference on Service-Oriented Computing and Applications

**SOCA 2014**

## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Message from the Chairs</td>
<td>xi</td>
</tr>
<tr>
<td></td>
<td>Organizing Committee</td>
<td>xiii</td>
</tr>
<tr>
<td></td>
<td>Program Committee</td>
<td>xiv</td>
</tr>
<tr>
<td></td>
<td>Keynote Abstracts</td>
<td>xvi</td>
</tr>
</tbody>
</table>

## SOCA Session 1: Service Quality

**Investigating the Change-Proneness of Service Patterns and Antipatterns**

*Francis Palma, Le An, Foutse Khomh, Naouel Moha, and Yann-Gaël Guéhéneuc*

**Offline Trace Checking of Quantitative Properties of Service-Based Applications**

*Domenico Bianculli, Carlo Ghezzi, Srdan Krstić, and Pierluigi San Pietro*

**Harnessing Implicit Teamwork Knowledge to Improve Quality in Crowdsourcing Processes**

*Mohammad Allahbakhsh, Samira Samimi, Hamid-Reza Motahari-Nezhad, and Boualem Benatallah*

## SOCA Session 2: Business Processes

**Compiling More Precise Petri Net Models for an Improved Verification of Service Implementations**

*Thomas S. Heinze, Wolfram Amme, and Simon Moser*

**BPEL Conformance in Open Source Engines: The Case of Static Analysis**

*Simon Harrer, Christian Preißinger, and Guido Wirtz*

**Effective Runtime Monitoring of Distributed Event-Based Enterprise Systems with ASIA**

*Sebastian Frischbier, Erman Turan, Michael Gesmann, Alessandro Margara, David Eyers, Patrick Eugster, Peter Pietzuch, and Alejandro Buchmann*
**SOCA Session 3: Service Selection**

Auction-Based Resource Access Protocols in IoT Service Systems .......................................................... 49

Che-Wei Liang, Jane Yung-Jen Hsu, and Kwei-Jay Lin

Attribute Based Service Customization and Selection ............................................................................... 57

Jun Yan, Hao Gao, and Yi Mu

IoT Service Selection Based on Physical Service Model and Absolute Dominance Relationship ............ 65

Xiongnan Jin, Sejin Chun, Jooik Jung, and Kyong-Ho Lee

**SOCA Session 4: Service-Oriented Applications**

Assistive Robot Enabled Service Architecture to Support Home-Based Dementia Care ....................... 73

Rajiv Khosla, Khanh Nguyen, and Mei-Tai Chu

Improved Heuristics with Data Rounding for Combinatorial Food Packing Problems ......................... 81

Yoshiyuki Karuno and Kenju Tateishi

**SOCA Session 5: Service Composition**

SCE^MT: A Multi-tenant Service Composition Engine ............................................................................. 89

Michael Hahn, Santiago Gómez Sáez, Vasilios Andrikopoulos, Dimka Karastoyanova, and Frank Leymann

QoS-Aware Service Composition in Mobile Environments ........................................................................ 97

Nguyen Cao Hong Ngoc, Donghui Lin, Takao Nakaguchi, and Toru Ishida

Applying Reinforcement Learning for Resolving Ambiguity in Service Composition ......................... 105

Alexander Jungmann, Felix Mohr, and Bernd Kleinjohann

**SOCA Session 6: Short Paper Session**

SEPP: Semantics-Based Management of Fast Data Streams ..................................................................... 113

Dominik Riemer, Ljiljana Stojanovic, and Nenad Stojanovic

Replicability of Dynamically Provisioned Scientific Experiments ............................................................. 119

Karolina Vukojevic-Haupt, Florian Haupt, Dimka Karastoyanova, and Frank Leymann

Reliability Prediction for Service Oriented System via Matrix Factorization in a Collaborative Way ......................................................................................................................... 125

Yueshen Xu, Jianwei Yin, Zizheng Wu, Dongqing He, and Yan Tan

Inferring Business Rules from Natural Language Expressions ................................................................... 131

Giovanni Aiello, Roberto Di Bernardo, Martino Maggio, Daniele Di Bona, and Giuseppe Lo Re
SOCA Invited Paper Session on Cloud Computing

Cloud Modeling Languages by Example ........................................................................................................... 137
  Alexander Bergmayr, Manuel Wimmer, Gerti Kappel, and Michael Grossniklaus

A Taxonomy of Offloading in Mobile Cloud Computing .................................................................................... 147
  Hyun Jung La and Soo Dong Kim

Self-Contained Localization without Auxiliary Signals on Smart Devices ........................................................ 154
  Hsin-Hsien Peng, Chi-Chung Lo, Tsung-Ching Lin, and Yu-Chee Tseng

SOCA Invited Paper Session on Services in Enterprises

Value of Integration in Database and Service Domains ..................................................................................... 161
  Carlo Batini, Marco Castelli, Marco Comerio, and Gianluigi Viscusi

The Weighted Decision Matrix: Tracking Design Decisions in Service Compositions .................................. 169
  Alexandra Mazak and Bernhard Kratzwald

The Post-Theoretic Enterprise: A Service-Oriented View ................................................................................. 175
  Aditya K. Ghose and Hoa Dam

SOCA Invited Paper Session on Processes

Supporting Doctors through Mobile Multimodal Interaction and Process-Aware Execution of Clinical Guidelines .......................................................... 183
  Fabrizio Cossu, Andrea Marrella, Massimo Mecella, Alessandro Russo, Stephen Kimani, Giuliano Bertazzoni, Annunziata Colabianchi, Alessandro Corona, Aldo De Luise, Francesco Grasso, and Marianna Suppa

Achieving Intention-Centric BPM through Automated Planning ................................................................ 191
  Nick RTP van Beest, Nick Russell, Arthur HM ter Hofstede, and Alexander Lazovik

Towards a Robustness Evaluation Framework for BPEL Engines ................................................................... 199
  Simon Harrer, Guido Wirtz, Faris Nizamic, and Alexander Lazovik

SOCA Invited Paper Session on Advanced Services

Efficient Strategy Adaptation for Complex Multi-times Bilateral Negotiations ................................................. 207
  Katsuhide Fujita

Co-Clustering WSDL Documents to Bootstrap Service Discovery ................................................................ 215
  Tingting Liang, Liang Chen, Haochao Ying, and Jian Wu

Automating Stroke Patient Evaluation Using Sensor Data and SVM ............................................................ 223
  Paul Otten, Sang Hyuk Son, and Jonghyun Kim
The First International Workshop on Internet of Things Services (IoTS 2014)

IoTS Session 1
IoT Security: Ongoing Challenges and Research Opportunities .................................................................230
   Zhi-Kai Zhang, Michael Cheng Yi Cho, Chia-Wei Wang, Chia-Wei Hsu,
   Chong-Kuan Chen, and Shiuhpyng Shieh

IoTS Session 2
An Efficient and Adaptive IP Traceback Scheme .................................................................................................235
   Kayoko Iwamoto, Masakazu Soshi, and Takashi Satoh
Exploring the Collaborative Context Reasoning in IoT Based Intelligent Care Services ......................................241
   Chao-Lin Wu, Chuang-Wen You, Chun-Yuan Chen, Ching-Chi Chuang,
   and Tsung-Chi Chiang
Autonomous Service Management for Location and Context Aware Service ......................................................246
   Chi-Sheng Shih, Kwei-Jay Lin, Jyun-Jhe Chou, and Ching-Chi Chuang
Evaluation of the Identity and Compatibility of Multi-valued Cells
in Two-Dimensional Codes Using Smartphones ..................................................................................................252
   Nobuyuki Teraura and Kouichi Sakurai

IoTS Session 3
Survey of Vehicle IoT Bluetooth Devices ...........................................................................................................260
   Dennis Kengo Oka, Takahiro Furue, Lennart Langenhop, and Tomohiro Nishimura
Zigbee Security within the Framework of IoT .........................................................................................................265
   Wissam Razouk
Postquantum SSL/TLS for Embedded Systems ......................................................................................................266
   Yun-An Chang, Ming-Shing Chen, Jong-Shian Wu, and Bo-Yin Yang
A User-Friendly Authentication Solution Using NFC Card Emulation on Android ..............................................271
   Haw Lee, Wei-Chih Hong, Chia-Hung Kao, and Chen-Mou Cheng

The Fourth International Workshop on Knowledge and Service Technology for Life, Environment, and Sustainability (KASTLES 2014)

KASTLES Session 1
Applying Large-Scale Multi-unit Combinatorial Auctions with Reserve-Price Biddings
for Resource Allocations — A Preliminary Analysis ............................................................................................279
   Naoki Fukuta
A Preliminary Analysis on BLMAB-Based Approximate Optimization Support for Multi Agent Simulations on Multi-core and GPU-Based Computing Environment ......................................................... 284

Yoshihito Sano, Yoshiaki Kadono, and Naoki Fukuta

Estimating Pareto Fronts Using Issue Dependency for Bilateral Multi-issue Closed Nonlinear Negotiations ...................................................................................................................... 289

Shinji Kakimoto and Katsuhide Fujita

**KASTLES Session 2**

Optimal Cooperative Microgrids for Online and Dynamic Energy Exchange in a Scalable Smart Distribution System .................................................................................................................. 294

Shantanu Chakraborty

**KASTLES Session 3**

An Implementation of a Local Issue Sharing System Based on Incentive Mechanism .......................................................................................................................... 295

Tatsunosuke Tsuboi, Tomohide Hayakawa, Ryo Suzuki, and Takayuki Ito

A 2D Indoor Positioning System Based on a Wireless Sensor Network Technology for Power Adjustable Solutions ........................................................................................................ 300

Mikhail M. Komarov

Anomaly Detection Algorithm for Localized Abnormal Weather Using Low-Cost Wireless Sensor Nodes ........................................................................................................................... 304

Takanobu Otsuka, Yoshitaka Torii, and Takayuki Ito

**KASTLES Session 4**

On Context Management Using Metro Maps .................................................................................................................. 309

Marat Zhanikeev


Srinivasa Shenoy, Nur Asyikin Abu Bakar, and Rajashekara Swamy

A Context Aware Decision Making Aid by Behavioral Characteristic .......................................................................................................................... 319

Mitsuaki Nakasumi

**The First International Workshop on Service Oriented Smart Cities (SOSC 2014)**

**SOSC Session 1**

ClouT: Leveraging Cloud Computing Techniques for Improving Management of Massive IoT Data .............................................................................................................................. 324

José Antonio Galache, Takuro Yonezawa, Levent Gurgen, Daniele Pavia, Marco Grella, and Hiroyuki Maemichi

Situated Engagement and Virtual Services in a Smart City .......................................................................................................................... 328

Simo Hosio, Jorge Goncalves, and Hannu Kukka
SOSC Session 2

Orchestration of Smart City Services across Ground, Air, and Space .................................................................332
  Jin Nakazawa, Hideyuki Tokuda, Yutaro Kyono, and Takuro Yonezawa

Crowdsourced Mobile Sensing for Smarter City Life ..........................................................................................334
  Kenro Aihara, Hajime Imura, Atsuhiro Takasu, Yuzuru Tanaka, and Jun Adachi

Author Index ..........................................................................................................................................................338