

2017 IEEE 41st Annual Computer Software and Applications Conference (COMPSAC 2017)

**Turin, Italy
4-8 July 2017**

**Volume 1
Pages 1-990**



**IEEE Catalog Number: CFP17061-POD
ISBN: 978-1-5386-0368-0**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17061-POD
ISBN (Print-On-Demand):	978-1-5386-0368-0
ISBN (Online):	978-1-5386-0367-3
ISSN:	0730-3157

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2017 IEEE 41st Annual Computer Software and Applications Conference

COMPSAC 2017

Table of Contents Volume - 1

Message from the Standing Committee Chair - Symposia.....	xviii
Message from the Steering Committee Chair - Symposia.....	xx
Message from the General Chairs - Symposia.....	xi
Message from the Program Chairs - Symposia.....	xxii
COMPSAC 2017 Organizers.....	xxiv
Symposia Organizers.....	xxvii

COMPSAC Symposia

SETA: Software Engineering Technology & Applications

Message from SETA 2017 Program Chairs	1
<i>Hridesh Rajan, Alexander Bolotov, and Chang Xu</i>	
Message from SETA 2017 Symposium Chairs	2
<i>Ricky Chan and Hong Zhu</i>	

SETA Session 1

An Empirical Comparison of Similarity Measures for Abstract Test Case Prioritization	3
<i>Rubing Huang, Yunan Zhou, Weiwen Zong, Dave Towey, and Jinfu Chen</i>	
Identifying Core Objects for Trace Summarization Using Reference Relations and Access Analysis	13
<i>Kunihiro Noda, Takashi Kobayashi, Tatsuya Toda, and Noritoshi Atsumi</i>	
LeakDAF: An Automated Tool for Detecting Leaked Activities and Fragments of Android Applications	23
<i>Ma Jun, Liu Sheng, Yue Shengtao, Tao Xianping, and Lu Jian</i>	

SETA Session 2

Measurement of Source Code Readability Using Word Concreteness and Memory	
Retention of Variable Names	33
<i>Weifeng Xu, Dianxiang Xu, and Lin Deng</i>	
Modeling and Analysis of the Security Protocol in C-DAX Based on Process Algebra	39
<i>Ailun Liu, Huibiao Zhu, Yuan Fei, Shuangqing Xiang, Gang Lu, and Wanling Xie</i>	
A Proof System for mCWQ	45
<i>Wanling Xie, Xi Wu, Huibiao Zhu, Gang Lu, and Ailun Liu</i>	
FeSCH: A Feature Selection Method Using Clusters of Hybrid-Data for Cross-Project	
Defect Prediction	51
<i>Chao Ni, Wangshu Liu, Qing Gu, Xiang Chen, and Daoxu Chen</i>	

SETA Session 3

Toward Understanding Information Models of Fault Localization: Elaborate is Not	
Always Better	57
<i>Yan Lei, Xiaoguang Mao, Min Zhang, Jingan Ren, and Yinhua Jiang</i>	
Comprehensive Static Analysis for Configurable Software via Combinatorial	
Instantiation	67
<i>Dong Yan, Linjie Pan, Rongjie Yan, Jun Yan, and Jian Zhang</i>	
Who Should be Selected to Perform a Task in Crowdsourced Testing?	75
<i>Qiang Cui, Junjie Wang, Guowei Yang, Miao Xie, Qing Wang, and Mingshu Li</i>	

SETA Session 4

A Constraint-Pattern Based Method for Reachability Determination	85
<i>Yuxing Wang, Zuxing Gu, Xi Cheng, Min Zhou, Xiaoyu Song, Ming Gu, and Jiaguang Sun</i>	
Defining and Validating a Client-Based Cohesion Metric for Object-Oriented Classes	91
<i>Musaad Alzahrani and Austin Melton</i>	
Towards an Agent-Oriented Framework for Multidisciplinary Decision Support and Its	
Application to Triple Assessment of Breast Cancer	97
<i>Liang Xiao and John Fox</i>	
Revisiting the Correlation Between Alerts and Software Defects: A Case Study	
on MyFaces, Camel, and CXF	103
<i>Meng Yan, Xiaohong Zhang, Ling Xu, Haibo Hu, Song Sun, and Xin Xia</i>	

SETA Session 5

Quality Assessment of Interaction Techniques in Immersive Virtual Environments Using	
Physiological Measures	109
<i>Rafael Rieder, Christian Haag Kristensen, and Márcio Sarroglia Pinho</i>	
Interactively Decomposing Composite Changes to Support Code Review	
and Regression Testing	118
<i>Bo Guo and Myoungkyu Song</i>	

Can Developers' Interaction Data Improve Change Recommendation?	128
<i>Akihiro Yamamori, Anders Mikael Hagward, and Takashi Kobayashi</i>	

SETA Session 6

An Approach to Proving Proof Obligation of Hybrid Event B Based on Differential Invariants	138
<i>Jie Liu, Jing Liu, Miaomiao Zhang, Haiying Sun, Xiaohong Chen, Dehui Du, and Mingsong Chen</i>	
Preserving the Benefits of Open Government Data by Measuring and Improving Their Quality: An Empirical Study	144
<i>Marco Torchiano, Antonio Vetrò, and Francesca Iuliano</i>	
Assertion Recommendation for Formal Program Verification	154
<i>Cong Wang, Fei He, Xiaoyu Song, Yu Jiang, Ming Gu, and Jiaguang Sun</i>	

SETA Session 7

A Hierarchical Categorization Approach for Configuration Management Modules	160
<i>Wei Chen, Peixing Xu, Wensheng Dou, Guoquan Wu, Chushu Gao, and Jun Wei</i>	
Supporting the Development of Agent-Based Simulations: A DSL for Environment Modeling	170
<i>Fernando Santos, Ingrid Nunes, and Ana L. C. Bazzan</i>	
Tool-Supported Collaborative Requirements Prioritisation	180
<i>Paolo Busetta, Fitsum Meshesha Kifetew, Denisse Munante, Anna Perini, Alberto Siena, and Angelo Susi</i>	

SETA Session 8

Finding Extract Method Refactoring Opportunities by Analyzing Development History	190
<i>Ayaka Imazato, Yoshiki Higo, Keisuke Hotta, and Shinji Kusumoto</i>	
Infer Precise Program Invariant Using Abstract Interpretation with Recurrence Solving	196
<i>Zhenpeng Fang, Xibin Zhao, and Min Zhou</i>	
XMLValue: XML Configuration Attribute Value Recommendation	202
<i>Yiqi Lu, Jiaqing Liang, Yanghua Xiao, Sheng Huang, Deqing Yang, Wei Wang, and Haibo Lin</i>	
Tester Experience: Concept, Issues and Definition	208
<i>Oswald Mesumbe Ekwoge, Awdren Fontão, and Arilo C. Dias-Neto</i>	

SETA Session 9

Xdroid: Testing Android Apps with Dependency Injection	214
<i>Chun Cao, Chenglin Meng, Hongjun Ge, Ping Yu, and Xiaoxing Ma</i>	
Towards Variability Management in Bidirectional Model Transformation	224
<i>Xiao He, Zhenjiang Hu, and Yi Liu</i>	
Models of Connected Things: On Priced Probabilistic Timed Reo	234
<i>Kangli He, Holger Hermanns, and Yixiang Chen</i>	

SETA Session 10

An Empirical Analysis on Effective Fault Prediction Model Developed Using Ensemble Methods	244
<i>Lov Kumar, Santanu Rath, and Ashish Sureka</i>	
Pain Points for Novice Programmers of Ambient Intelligence Systems: An Exploratory Study	250
<i>Fulvio Corno, Luigi De Russis, and Juan Pablo Sáenz</i>	
Fault Classification Oriented Spectrum Based Fault Localization	256
<i>Xiujing Liu, Yong Liu, Zheng Li, and Ruilian Zhao</i>	
ISO/IEC 25010 Based Evaluation of Free Mobile Personal Health Records for Pregnancy Monitoring	262
<i>Ali Idri, Mariam Bachiri, José Luis Fernández-Aleman, and Ambrosio Toval</i>	

SETA Session 11

Using MDA to Automate the Integration of Virtual Platforms for System-Level Simulation	268
<i>David Perillo and Marco Di Natale</i>	
An ICE Compliant Component Model for Medical Systems Development	278
<i>Imad Eddine Touahria, Marisol García-Valls, and Abdellah Khababa</i>	
Tool Support for Managing Clone Refactorings to Facilitate Code Review in Evolving Software	288
<i>Zhiyuan Chen, Maneesh Mohanavilasam, Young-Woo Kwon, and Myoungkyu Song</i>	

SETA Session 12

A High-Level DSL for Geospatial Visualizations with Multi-core Parallelism Support	298
<i>Cleverson Ledur, Dalvan Griebler, Isabel Manssour, and Luiz Gustavo Fernandes</i>	
The Need for Traceability in Heterogeneous Systems: A Systematic Literature Review	305
<i>Nasser Mustafa and Yvan Labiche</i>	
Incremental Annotate-Generalize-Search Framework for Interactive Source Code Comprehension	311
<i>Ken Nakayama, Shun'ichi Tano, Tomonori Hashiyama, and Eko Sakai</i>	

SETA Session 13

Detecting Java Code Clones with Multi-granularities Based on Bytecode	317
<i>Dongjin Yu, Jie Wang, Qing Wu, Jiazha Yang, Jiaoqiao Wang, Wei Yang, and Wei Yan</i>	
Supporting the Specification and Serialization of Planned Architectures in Architecture-Driven Modernization Context	327
<i>André de S. Landi, Fernando Chagas, Bruno M. Santos, Renato S. Costa, Rafael Durelli, Ricardo Terra, and Valter V. de Camargo</i>	
GenLog: Accurate Log Template Discovery for Stripped X86 Binaries	337
<i>Maosheng Zhang, Ying Zhao, and Zengmingyu He</i>	

SETA Session 14

A Situation-Centric Approach to Identifying New User Intentions Using the MTL Method	347
<i>Jingwei Yang, Carl K. Chang, and Hua Ming</i>	
State-Based Tests Suites Automatic Generation Tool (STAGE-1)	357
<i>Hoda Khalil and Yvan Labiche</i>	
Mediating Turf Battles! Prioritizing Shared Modules in Locating Multiple Features	363
<i>Maaki Nakano, Kunihiro Noda, Shinpei Hayashi, and Takashi Kobayashi</i>	
On the Composability of Design Patterns: Extended Abstract	369
<i>Hong Zhu and Ian Bayley</i>	

CELT: Computer Education & Learning Technologies

CELT Session 1

Mining Capstone Project Wikis for Knowledge Discovery	371
<i>Swapna Gottipati, Venky Shankararaman, and Melvrick Goh</i>	
Experimental Validation of a Massive Educational Service in a Blended Learning Environment	381
<i>Elena Baralis, Luca Cagliero, Laura Farinetti, Marco Mezzalama, and Enrico Venuto</i>	
A Microservice-Based MOOL in Acoustics Addressing the Learning-at-Scale Scenario	391
<i>Antonella Longo and Marco Zappatore</i>	

CELT Session 2

Test-Driven Summarization: Combining Formative Assessment with Teaching Document Summarization	401
<i>Luca Cagliero, Laura Farinetti, and Elena Baralis</i>	
Self-Paced Approach in Synergistic Model for Supporting and Testing Students	407
<i>Alice Barana, Marina Marchisio, Alessandro Bogino, Lorenza Operti, Michele Fioravera, Sergio Rabellino, and Francesco Floris</i>	

CELT Session 3

Toward Blocks-Text Parity	413
<i>Chris Johnson and Adrian Abundez-Arce</i>	
Teaching Test-First Programming: Assessment and Solutions	420
<i>Marcello Missiroli, Daniel Russo, and Paolo Ciancarini</i>	
SEABED: An Open-Source Software Engineering Case-Based Learning Database	426
<i>Veena Saini, Paramvir Singh, and Ashish Sureka</i>	
Adaptive Teaching Supported by ICTs to Reduce the School Failure in the Project “Scuola Dei Compiti”	432
<i>Alice Barana, Michele Fioravera, Marina Marchisio, and Sergio Rabellino</i>	

CELT Session 4

Cloud Adapted Workflow e-Assessment System: Cloud-AWAS	438
<i>Fahima Hajjej, Yousra Bendaly Hlaoui, and Leila Jemni Ben Ayed</i>	
Evaluating the Use of Virtual Reality on Professional Robotics Education	448
<i>Mauro César Charão dos Santos, Vicenzo Abichequer Sangalli, and Marcio Sarroglia Pinho</i>	
Combinations of Personal Characteristic Types and Learning Effectiveness of Teams	456
<i>Hironori Washizaki, Yusuke Sunaga, Masashi Shuto, Katsuhiko Kakehi, Yoshiaki Fukazawa, Shoso Yamato, Masashi Okubo, and Bastian Tenbergen</i>	

CAP: Computer Architecture & Platforms

Message from the CAP 2017 Organizing Committee	458
<i>Cristina Seceleanu, Hironori Kasahara, and Tiberiu Seceleanu</i>	

CAP Session 1

An Extensible Pervasive Platform for Large-Scale Anticipatory Mobile Computing	459
<i>Christian Meurisch, Bennet Jeutter, Wladimir Schmidt, Nickolas Gündling, Benedikt Schmidt, Fabian Herrlich, and Max Mühlhäuser</i>	
A Novel Integrated Architecture for Ambient Assisted Living Systems	465
<i>Ashalatha Kunnappilly, Alexandru Sorici, Imad Alex Awada, Irina Mocanu, Cristina Seceleanu, and Adina Madga Florea</i>	

CAP Session 2

RefCRE: A Reference Count Based Rewriting Framework for VM Image Restoration	473
<i>Jiwei Xu, Xiaozhao Xing, Tao Wang, Zhigang Lu, and Wenbo Zhang</i>	
xB+-Tree: Access-Pattern-Aware Cache-Line-Based Tree for Non-volatile Main	
Memory Architecture	483
<i>Li-Zheng Liang, Ming-Chang Yang, Yuan-Hao Chang, Tseng-Yi Chen, Shuo-Han Chen, Hsin-Wen Wei, and Wei-Kuan Shih</i>	
Multicore Cache Coherence Control by a Parallelizing Compiler	492
<i>Hironori Kasahara, Keiji Kimura, Boma A. Adhi, Yuhei Hosokawa, Yohei Kishimoto, and Masayoshi Mase</i>	

NCIW: Networks, Communications, Internet, & Web Technologies

Message from the NCIW Program Co-chairs	498
<i>Tugkan Tuglular and Ying Cai</i>	

NCIW Session 1

Formalization and Verification of the PKMv3 Protocol Using CSP	499
<i>Yuanmin Xu, Huibiao Zhu, Xiaoran Zhu, Xi Wu, Jian Guo, and Gang Lu</i>	
Cardinality Counting Circuit for Real-Time Abnormal Traffic Detection	505
<i>Shuji Sannomiya, Akira Sato, Kenichi Yoshida, and Hiroaki Nishikawa</i>	

Cache Effect of Shared DNS Resolver	511
<i>Kazunori Fujiwara, Akira Sato, and Kenichi Yoshida</i>	

NCIW Session 2

A Framework for User-Friendly Verification-Oriented VNF Modeling	517
<i>Guido Marchetto, Riccardo Sisto, Matteo Virgilio, and Jalolliddin Yusupov</i>	
Router Position-Based Cooperative Caching for Video-on-Demand in Information-Centric Networking	523
<i>Zhe Zhang, Chung-Horng Lung, Ioannis Lambadaris, Marc St-Hilaire, and Sankarshan Sakkarepattana Nagaraja Rao</i>	

NCIW Session 3

Automatic Construction of Name-Bound Virtual Networks for IoT	529
<i>Kenji Fujikawa, Ved P. Kafle, Pedro Martinez-Julia, Abu Hena Al Muktadir, and Hiroaki Harai</i>	
Analysis of Geographic DTN Routing under Random Walk Mobility Model	538
<i>Daiki Matsui, Ryo Haghara, Yasuhiro Yamasaki, and Hiroyuki Ohsaki</i>	
Formal Modelling and Verification of Requirements of Adaptive Routing Protocol for Mobile Ad-Hoc Network	548
<i>Bata Krishna Tripathy, Ashray Sudhir, Padmalochan Bera, and Mohammad Ashiqur Rahman</i>	

NCIW Session 4

Supporting Interoperability among Web Services Through Efficient Matching	557
<i>Xiaocao Hu, Zhiyong Feng, Keman Huang, and Shizhan Chen</i>	
Practical Enhancement and Evaluation of a Low-Latency Network Model Using Mobile Edge Computing	567
<i>Krittin Intharawijit, Katsuyoshi Iida, Hiroyuki Koga, and Katsunori Yamaoka</i>	
CoAP-CTX: A Context-Aware CoAP Extension for Smart Objects Discovery in Internet of Things	575
<i>Felipe M. Barreto, Paulo A. de S. Duarte, Marcio E. F. Maia, Rossana M. de C. Andrade, and Windson Viana</i>	

SEPT: Security, Privacy, & Trust

Message from SEPT 2017 Organizing Committee	585
<i>Katsuyoshi Iida and Mohammad Zulkernine</i>	

SEPT Session 1

Enforcing Generalized Refinement-Based Noninterference for Secure Interface Composition	586
<i>Cong Sun, Ning Xi, and Jianfeng Ma</i>	

Securing Link State Routing for Wireless Networks against Byzantine Attacks: A Monitoring Approach	596
<i>Babatunde Ojetunde, Naoki Shibata, and Juntao Gao</i>	
Authenticating Preference-Oriented Multiple Users Spatial Queries	602
<i>Xiaoran Duan, Yong Wang, Juguang Chen, and Junhao Zhang</i>	

SEPT Session 2

An In-depth Concealed File System with GPS Authentication Adaptable for Multiple Locations	608
<i>Yong Jin, Masahiko Tomoishi, and Satoshi Matsuura</i>	
Automated Crash Filtering Using Interprocedural Static Analysis for Binary Codes	614
<i>Hyeon-Gu Jeon, Seong-Kyun Mok, and Eun-Sun Cho</i>	
Seer: A Lightweight Online Failure Prediction Approach	624
<i>Burcu Ozcelik and Cemal Yilmaz</i>	

SEPT Session 3 — Keynote

Physical Attestation in the Smart Grid for Distributed State Verification	626
<i>Thomas Roth and Bruce M. McMillin</i>	

SEPT Session 4

SecretSafe: A Lightweight Approach against Heap Buffer Over-Read Attack	628
<i>Xiaoguang Wang, Yong Qi, Chi Zhang, Saiyu Qi, and Peijian Wang</i>	
Challenge to Impede Deep Learning against CAPTCHA with Ergonomic Design	637
<i>Tomoka Azakami, Chihiro Shibata, and Ryuya Uda</i>	
DomainChroma: Providing Optimal Countermeasures against Malicious Domain Names	643
<i>Daiki Chiba, Mitsuaki Akiyama, Takeshi Yagi, Takeshi Yada, Tatsuya Mori, and Shigeki Goto</i>	
Claimsware: A Claims-Based Middleware for Securing IoT Services	649
<i>Vathalloor Merin George and Qusay H. Mahmoud</i>	

SEPT Session 5

Detecting Malicious Websites by Integrating Malicious, Benign, and Compromised Redirection Subgraph Similarities	655
<i>Toshiki Shibahara, Yuta Takata, Mitsuaki Akiyama, Takeshi Yagi, and Takeshi Yada</i>	
TLS Connection Validation by Web Browsers: Why do Web Browsers Still Not Agree?	665
<i>A. S. Wazan, R. Laborde, D. W. Chadwick, F. Barrere, and A. Benzekri</i>	
An Inferential Metamorphic Testing Approach to Reduce False Positives in SQLIV Penetration Test	675
<i>Lei Liu, Guoxin Su, Jing Xu, Biao Zhang, Jiehui Kang, Sihan Xu, Peng Li, and Guannan Si</i>	

Student Research Symposium

Message from the Student Research Symposium Chairs	681
<i>Claudio Demartini, Kenichi Yoshida, and Luigi De Russis</i>	

SRS Session 1

Research on Integrated Authentication Using Passwordless Authentication Method	682
<i>Michitomo Morii, Hiroki Tanioka, Kenji Ohira, Masahiko Sano, Yosuke Seki, Kenji Matsuura, and Tetsushi Ueta</i>	
On the Effect of Scale-Free Structure of Network Topology on Performance of Content-Centric Networking	686
<i>Ryo Nakamura and Hiroyuki Ohsaki</i>	
A Fluid-Based Model of a Transport Protocol in Content-Centric Networking	690
<i>Tsuyoshi Yabuuchi, Ryo Nakamura, and Hiroyuki Ohsaki</i>	

SRS Session 2

How GitHub Contributing.md Contributes to Contributors	694
<i>Naoki Kobayakawa and Kenichi Yoshida</i>	
On the Effectiveness of Link Addition for Improving Robustness of Multiplex Networks against Layer Node-Based Attack	697
<i>Yui Kazawa and Sho Tsugawa</i>	
On Message Delivery Delay of Epidemic DTN Routing with Broadcasting ACKs	701
<i>Natsuko Kawabata, Yasuhiro Yamasaki, and Hiroyuki Ohsaki</i>	

Fog Computing and Networking — Business Drivers and Impacts

Fogonomics — The Strategic, Economic, and Financial Aspects of the Cloud	705
<i>Joe Weinman</i>	

Fog Computing and Networking — Technology Drivers and Impacts

Application Deployment through the Fog	706
<i>Antonio Brogi</i>	
Secure Fog Computing for Smart Living	707
<i>Bruce McMillin</i>	
FA2ST: Fog as a Service Technology	708
<i>Yang Yang</i>	

ITiP: IT in Practice

ITIP Session 1

The Adoption of Emerging Technology: Technology Before Requirements	709
<i>Stephen J. Andriole</i>	
Process Patterns: Reusable Design Artifacts for Business Process Models	714
<i>Muhammad Ashad Kabir, Zhenchang Xing, Prakash Chandrasekaran, and Shang-Wei Lin</i>	
Situation-Aware Data-Driven Decision Making in Smart Environments Using the MapReduce	722
<i>Hoda Gholami and Carl K. Chang</i>	

ITIP Session 2

Tool Integration in the Aerospace Domain: A Case Study	731
<i>Iacopo Vagliano, Davide Ferretto, Eugenio Brusa, Maurizio Morisio, and Laura Valacca</i>	
Strategies and Challenges on the Accessibility and Interoperability of e-Government Web Portals: A Case Study on Brazilian Federal Universities	737
<i>Alberto Dumont Alves Oliveira and Marcelo Medeiros Eler</i>	
Software Industry Practice in Africa: Case Study Sudan	743
<i>Saleh Alamdy and Rasha Osman</i>	

ITIP Session 3

Agent Marketplaces and Deep Learning in Enterprises: The COMPOSITION Project	749
<i>Dario Bonino and Paolo Vergori</i>	
DIIG: A Distributed Industrial IoT Gateway	755
<i>Masoud Hemmatpour, Mohammad Ghazivakili, Bartolomeo Montruccio, and Maurizio Rebaudengo</i>	
Towards Verifiable Safe and Correct Medical Best Practice Guideline Systems	760
<i>Chunhui Guo, Zhicheng Fu, Shangping Ren, Yu Jiang, and Lui Sha</i>	

DSAT: Data Sciences, Analytics, & Technologies

DSAT Session 1 — Data Analytics Competition

DSAT Session 2

Inference of Extreme Synchrony with an Entropy Measure on a Bipartite Network	766
<i>Aki-Hiro Sato</i>	
Predicting Misconfiguration-Induced Unsuccessful Executions of Jobs in Big Data System	772
<i>Tang Hongyan, Li Ying, Wang Long, Gu Jing, and Wu Zhonghai</i>	

DSAT Session 3

R-Extractor: A Method for Data Extraction from Template-Based Entity-Pages	778
<i>Edimar Manica, Carina F. Dorneles, and Renata Galante</i>	
Container Rebalancing: Towards Proactive Linux Containers Placement Optimization in a Data Center	788
<i>Pongsakorn U-Chupala, Yasuhiro Watashiba, Kohei Ichikawa, Susumu Date, and Hajimu Iida</i>	
HybridFS — A High Performance and Balanced File System Framework with Multiple Distributed File Systems	796
<i>Lidong Zhang, Yongwei Wu, Ruini Xue, Tse-Chuan Hsu, Hongji Yang, and Yeh-Ching Chung</i>	

DSAT Session 4

A Parallel Self-Organizing Community Detection Algorithm Based on Swarm Intelligence for Large Scale Complex Networks	806
<i>Hanlin Sun, Wei Jie, Christian Sauer, Sugang Ma, Gang Han, Zhongmin Wang, and Kui Xing</i>	
KANDOR — Knowledge Analysis of Neighborhood Dynamics and Online Relationships	816
<i>Ricardo Chagas Rapacki, Leandro Krug Wives, and Renata Galante</i>	
An Adaptive Diversity-Based Ensemble Method for Binary Classification	822
<i>Xing Fan, Chung-Horng Lung, and Samuel A. Ajila</i>	
Combining Word and Character N-Grams for Detecting Deceptive Opinions	828
<i>Al Hafiz Akbar Maulana Siagian and Masayoshi Aritsugi</i>	

HCSC: Human Computing & Social Computing

Message from HCSC Organizing Committee	834
<i>Moushumi Sharmin and Jalal Mahmud</i>	

HCSC Session 1

Opportunities and Challenges in Designing Participant-Centric Smoking Cessation System	835
<i>Moushumi Sharmin, Theodore Weber, Hillol Sarker, Nazir Saleheen, Santosh Kumar, Shameem Ahmed, and Mustafa Al' Absi</i>	
Simple Group Photo Sharing Using Facesense	845
<i>Nova Ahmed, Minhaz Ahmed Syrus, and Arshad Chowdhury</i>	
Tactile Interface Design for Helping Mobility of People with Visual Disabilities	851
<i>Christian Lykawka, Bruno Konzen Stahl, Marcia de Borba Campos, Jaime Sanchez, and Márcio Sarroglia Pinho</i>	

HCSC Session 2

Understanding the Feasibility of a Location-Aware Mobile-Based 911-Like Emergency Service in Bangladesh	861
<i>Md Monsur Hossain, Moushumi Sharmin, and Shameem Ahmed</i>	
Your Mouse Reveals Your Next Activity: Towards Predicting User Intention from Mouse Interaction	869
<i>Eugene Yujun Fu, Tiffany C.K. Kwok, Erin You Wu, Hong Va Leong, Grace Ngai, and Stephen C.F. Chan</i>	

HCSC Session 3

Spreadsheet Element Sharing through Synchronization	875
<i>Massimo Maresca and Pierpaolo Baglietto</i>	
Users Interfaces Adaptation for Visually Impaired Users Based on Meta-Model Transformation	881
<i>Lamia Zouhaier, Yousra Bendaly Hlaoui, and Leila Jemni Ben Ayed</i>	

EATA: Emerging Advances in Technology & Applications

Message from the EATA 2017 Co-Chairs	887
<i>Ali Hurson and Hiroyuki Sato</i>	

EATA Session 1

Ontology-Based Social Media Analysis for Urban Planning	888
<i>Xinxin Gao, Wencheng Yu, Yilong Rong, and Songmao Zhang</i>	
Improving Mobility in Smart Cities with Intelligent Tourist Trip Planning	897
<i>Petar Mrazovic, Josep L. Larriba-Pey, and Mihail Matskin</i>	

EATA Session 2

SNS Agency Robot for Elderly People Using External Cloud-Based Services	908
<i>Toru Kobayashi, Kazushige Katsuragi, Taishi Miyazaki, and Kenichi Arai</i>	
Building Energy Modelling and Monitoring by Integration of IoT Devices and Building Information Models	914
<i>Lorenzo Bottaccioli, Alessandro Aliberti, Francesca Ugliotti, Edoardo Patti, Anna Osello, Enrico Macii, and Andrea Acquaviva</i>	

EATA Session 3

Efficient Worker Selection Through History-Based Learning in Crowdsourcing	923
<i>Tarek Awwad, Nadia Bennani, Konstantin Ziegler, Veronika Sonigo, Lionel Brunie, and Harald Kosch</i>	
Collaborative Computation Offloading in Heterogeneous Asynchronous Cloud Environment	929
<i>Lei Ma, Bing Yu, Hiroyuki Sato, and Yadong Wang</i>	

Dynamic Data Flow Processing in Edge Computing Environments	935
<i>Yuuichi Teranishi, Takashi Kimata, Hiroaki Yamanaka, Eiji Kawai, and Hiroaki Harai</i>	

MOWU: Mobile, Wearable, & Ubiquitous Computing

Message from the MOWU 2017 Organizing Committee	945
<i>Vladimir Getov and Hong Va Leong</i>	

MOWU Session 1

A Novel Framework to Recognize Complex Human Activity	N/A
<i>Md Osman Gani, Amit Kumar Saha, Golam Mushih Tanimul Ahsan, Sheikh Iqbal Ahamed, and Roger O. Smith</i>	
CAOS: A Context Acquisition and Offloading System	N/A
<i>Francisco A. A. Gomes, Paulo A. L. Rego, Lincoln Rocha, José N. de Souza, and Fernando Trinta</i>	
A Novel Real-Time Non-invasive Hemoglobin Level Detection Using Video Images from Smartphone Camera	967
<i>Golam M. T. Ahsan, Md. O. Gani, Md. K. Hasan, Sheikh I. Ahamed, William Chu, Mohammad Adibuzzaman, and Joshua Field</i>	

MOWU Session 2

Polynomial Classification Model for Real-Time Fall Prediction System	973
<i>Masoud Hemmatpour, Milad Karimshoushtari, Renato Ferrero, Bartolomeo Montruccio, Maurizio Rebaudengo, and Carlo Novara</i>	
Enabling Flexible and Efficient Remote Execution in Opportunistic Networks through Message-Oriented Middleware	979
<i>Minh Le, Myoungkyu Song, and Young-Woo Kwon</i>	
Author Index - Symposia	985

2017 IEEE 41st Annual Computer Software and Applications Conference (COMPSAC 2017)

**Turin, Italy
4-8 July 2017**

**Volume 2
Pages 1-800**



**IEEE Catalog Number: CFP17061-POD
ISBN: 978-1-5386-0368-0**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17061-POD
ISBN (Print-On-Demand):	978-1-5386-0368-0
ISBN (Online):	978-1-5386-0367-3
ISSN:	0730-3157

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2017 IEEE 41st Annual Computer Software and Applications Conference

COMPSAC 2017

Table of Contents Volume - 2

Message from the Standing Committee Chair - Workshops	xx
Message from the Steering Committee Chair - Workshops.....	xxii
Message from the General Chairs - Workshops.....	xxiii
Message from the Program Chairs - Workshops.....	xxiv
Message from the Workshop Chairs.....	xxvi
COMPSAC Workshop Organizers.....	xxvii

COMPSAC 2016 Workshops

ADMNET: The 4th IEEE International COMPSAC Workshop on Architecture, Design, Deployment and Management of Networks and Applications

Session 1: Test, Measurement

DNetSpec: A Distributed Network Testing Toolset for Middleware Developers	1
<i>Shintaro Ishihara, Fujita Masahiro, and Toyokazu Akiyama</i>	
Improving Packet Capture Trace Import in Trace Compass with a Data Transformation	
DSL	7
<i>Ruediger Gad</i>	
Interest ACK: A Fast Packet Loss Detection Mechanism for Content-Centric Networking	13
<i>Tsuyoshi Yabuuchi, Ryo Nakamura, and Hiroyuki Ohsaki</i>	

Session 2: Resource Balancing

A Method of Mobile Core Network Load Reduction Using Autonomous Clustering-Based Two-Layered Structure for Information Dissemination in Wireless Networks	19
<i>Toshikazu Terami, Tomoyuki Ohta, and Yoshiaki Kakuda</i>	
Resource Allocation Methods Considering Residual Link Bandwidth for Service Function Chaining Design	25
<i>Naoki Akutsu and Ken-Ichi Baba</i>	
LXC Container Migration in Cloudlets under Multipath TCP	31
<i>Yuqing Qiu, Chung-Horng Lung, Samuel Ajila, and Pradeep Srivastava</i>	

Session 3: Security and Invited Talk

Cache Function Activation on a Client Based DNSSEC Validation and Alert System by Multithreading	37
<i>Kunitaka Kakoi, Yong Jin, Nariyoshi Yamai, Naoya Kitagawa, and Masahiko Tomoishi</i>	
A Spoofed E-Mail Countermeasure Method by Scoring the Reliability of DKIM Signature Using Communication Data	43
<i>Kanako Konno, Kenya Dan, and Naoya Kitagawa</i>	
Deployment of Multilanguage Security Awareness Education Online Course by Federated Moodle in Japan	49
<i>Hiroshi Ueda and Motonori Nakamura</i>	

STA: The 9th IEEE International COMPSAC Workshop on Software Test Automation

Message from STA 2017 Workshop Co-Chairs	53
<i>Fevzi Belli and Rajesh Subramanyan</i>	

Session 1: Feature and Interface Based Testing

Applying Feature Selection to Software Defect Prediction Using Multi-objective Optimization	54
<i>Xiang Chen, Yuxiang Shen, Zhanqi Cui, and Xiaolin Ju</i>	
A Model-Based Framework for Cloud API Testing	60
<i>Junyi Wang, Xiaoying Bai, Linyi Li, Zhicheng Ji, and Haoran Ma</i>	
FORMAT: A Tool for Adapting Test Models Based on Feature Models	66
<i>Burcu Ergun, Ceren Şahin Gebizli, and Hasan Sözer</i>	
OpenFlow Modeling Based on CPN for Evolution Consideration and Executable Test Case Generation	72
<i>Hongwei Ruan, Lu Wang, Xiao Yang, Lulu Dong, and Hua Li</i>	

Session 2: Formal Methods

Theoretical, Weak and Strong Accuracy Graphs of Spectrum-Based Fault Localization Formulas	78
<i>C. M. Tang, W. K. Chan, and Y. T. Yu</i>	
A Case Study on Context Maintenance in Dynamic Hybrid Race Detectors	84
<i>Jialin Yang, Ernest Bota Pobee, and W. K. Chan</i>	
How Does GUI Testing Exercise Application Logic Functionality?	90
<i>Abdulaziz Alkhalid and Yvan Labiche</i>	

ESAS: The 12th IEEE International COMPSAC Workshop on E-Health Systems and Semantic Web

ESAS Session 1

A Deep-Learning-Based Method of Estimating Water Intake	96
<i>Yutaro Yamada, Takato Saito, Satoshi Kawasaki, Daizo Ikeda, Masaji Katagiri, Masafumi Nishimura, and Hiroshi Mineno</i>	
Blood.Health.FOAF: Extending FOAF with Blood Ontology	102
<i>Okan Bursa, Emine Sezer, Ozgür Can, and Murat Osman Unalir</i>	
Standardizing the Crowdsourcing of Healthcare Data Using Modular Ontologies	107
<i>Hengyi Hu and Larry Kerschberg</i>	

ESAS Session 2

Towards Detecting Sex Offenders in Social Networks	113
<i>Sai K. Vallapu and Thoshitha T. Gamage</i>	
A Mathematical Model for a Hybrid System Framework for Privacy Preservation of Patient Health Records	119
<i>Kissi Mireku Kingsford, Fengli Zhang, Mensah Dennis Nii Ayeh, and Armah Mary Margaret</i>	

ESAS Session 3

Technological Module for Unsupervised, Personalized Cardiac Rehabilitation Exercising	125
<i>Anargyros Chatzitofis, Dimitrios Zarpalas, Dimitrios Filos, Andreas Triantafyllidis, Ioanna Chouvarda, Nicos Maglaveras, and Petros Daras</i>	
A Semantic Extraction and Sentimental Assessment of Risk Factors (SESARF): An NLP Approach for Precision Medicine: A Medical Decision Support Tool for Early Diagnosis from Clinical Notes	131
<i>Susan Sabra, Khalid Mahmood, and Mazen Aloabaidi</i>	
An Intelligent Tracking System: Application to Acute Respiratory Tract Infection (TrackARTI)	137
<i>Duygu Çelik Ertugrul, Atilla Elçi, and Yiltan Bitirim</i>	

SAPSE: The 9th IEEE International COMPSAC Workshop on Security Aspects in Processes and Services Engineering and CFSE: The 9th IEEE International COMPSAC Workshop on Computer Forensics in Software Engineering

Session 1: Distributed Services

Trust-Aware and Location-Based Collaborative Filtering for Web Service QoS Prediction	143
<i>Kai Chen, Hongyan Mao, Xiangyu Shi, Yuanmin Xu, and Ailun Liu</i>	
PRUCC-RM: Permission-Role-Usage Cardinality Constrained Role Mining	149
<i>Carlo Blundo, Stelvio Cimato, and Luisa Siniscalchi</i>	
Adaptive Cost Efficient Framework for Cloud-Based Machine Learning	155
<i>Rezvan Pakdel and John Herbert</i>	

Session 2: Data Protection

Querying Encrypted OLAP Data	161
<i>Alfredo Cuzzocrea and Giorgio Mario Grasso</i>	
Is PokéMon GO Watching You? A Survey on the Privacy-Awareness of Location-Based Apps' Users	164
<i>Chiara Braghin and Marilisa Del Vecchio</i>	
Digital Media Tampering Detection Techniques: An Overview	170
<i>Songpon Teerakanok and Tetsutaro Uehara</i>	

MVDA: The 6th IEEE International COMPSAC Workshop on Modeling and Verifying Distributed Applications

MVDA Session 1

A Modeling Approach for Flexible Workflow Applications of Cloud Services	175
<i>Imen Ben Fraj, Yousra Bendaly Hlaoui, and Leila Jemni Ben Ayed</i>	
Towards an ASM Specification for Monitoring and Adaptation Services of Large-Scale Distributed Systems	181
<i>Andreea Buga and Sorana Tania Nemes</i>	
From Sequence Diagrams to Event B: A Specification and Verification Approach of Flexible Workflow Applications of Cloud Services Based on Meta-model Transformation	187
<i>Yousra Bendaly Hlaoui, Ahlem Ben Younes, Leila Jemni Ben Ayed, and Manel Fathalli</i>	

MediComp: The 4th IEEE International COMPSAC Workshop on Medical Computing

Session 1: Predictive Data Analysis

Chronic Kidney Disease Prediction on Imbalanced Data by Multilayer Perceptron:	
Chronic Kidney Disease Prediction	193
<i>Pinar Yildirim</i>	
Identify Biological Modules and Hub MiRNAs for Oral Squamous Cell Carcinomas	199
<i>Doudou Zhou, Jianqiang Li, Ji-Jiang Yang, Qing Wang, Weiliang Qiu, Shi Chen, and Minhua Lu</i>	
An Initial Screening Method for Tuberculosis Diseases Using a Multi-objective Gradient Evolution-Based Support Vector Machine and C5.0 Decision Tree	204
<i>Ferani E. Zulvia, R. J. Kuo, and E. Roflin</i>	
SLC25A36 and ZFAND5 Expression Levels Altered by the Interaction of EtOH Dosage and Exposure Time in Human Dental Pulp Stem Cells	210
<i>Zhirui Wang, Jianqiang Li, Weiliang Qiu, Ji-Jiang Yang, Rui Mao, and Shi Chen</i>	

Session 2: Medical Association Analysis

Alcohol-Induced Differential Variable Genes	215
<i>Siyuan Liang, Jianqiang Li, Juan Li, Caiyun Yang, Weiliang Qiu, Ji-Jiang Yang, Zhihua Sun, and Rui Mao</i>	
A Novel Technique of Noninvasive Hemoglobin Level Measurement Using HSV Value of Fingertip Image	N/A
<i>Md Kamrul Hasan, Nazmus Sakib, Joshua Field, Richard R. Love, and Sheikh I. Ahamed</i>	
Re-Structuring and Specific Similarity Computation of Electronic Medical Records	230
<i>Yunxuan Zhang, Ziping He, Ji-Jiang Yang, Qing Wang, and Jianqiang Li</i>	

Session 3: Medical System and Evaluation

A Study of Machine Learning in Healthcare	236
<i>Rohan Bhardwaj, Ankita R. Nambiar, and Debojyoti Dutta</i>	
Breaking Implicit Trust in Point-of-Care Medical Technology: A Cyber-Physical Attestation Approach	242
<i>Fredrick Love and Bruce McMillin</i>	
Gene Network Modules Associated to DPSCs Differentiation	248
<i>Wenjing Xu, Juan Li, Jianqiang Li, Yue Li, Weiliang Qiu, Ji-Jiang Yang, Chunjie Guo, and Minhua Lu</i>	
The Investigation on Effectiveness Evaluation Methods for One Medical Material Used for Surgery Patients Based on Electronic Medical Records Data	253
<i>Bo Liu, Kelu Yao, Lan Wei, Xiaolu Fei, and WangQing</i>	

Fast Abstracts

Message from COMPSAC 2017 Fast Abstract Track Co-Chairs	259
<i>Dave Towsley, Michiharu (Michael) Takemoto, and Hossain Shahriar</i>	

Fast Abstracts Session 1

Infusing Topic Modeling into Interactive Program Comprehension: An Empirical Study	260
<i>Tianxia Wang and Yan Liu</i>	
First Meeting Time Formula of Two Random Walkers toward Understanding Epidemic Information Dissemination	262
<i>Yusuke Sakumoto and Hiroyuki Ohsaki</i>	
Toward Design of Garbled Circuits Using Quantum Gates	264
<i>Maryam Ehsanpour</i>	
New Strategies for Selecting Reuse Candidates on Automated Program Repair	266
<i>Akito Tanikado, Haruki Yokoyama, Masahiro Yamamoto, Soichi Sumi, Yoshiki Higo, and Shinji Kusumoto</i>	
Investigation and Detection of Split Commit	268
<i>Ryo Arima, Yoshiki Higo, and Shinji Kusumoto</i>	
Design of a Node Status Visualizing Software Utilizing the AR Technology for Multihop Wireless Networks	270
<i>Tomoyuki Ohta, Ryota Ito, and Yoshiaki Kakuda</i>	
Energy Consumption Measurements in Docker	272
<i>Senay Semu Tadesse, Francesco Malandrino, and Carla-Fabiana Chiasserini</i>	

Fast Abstracts Session 2

What Makes Software Energy-Efficient?: Make it Faster	274
<i>Hiroyuki Matsuo, Shinsuke Matsumoto, and Shinji Kusumoto</i>	
Identifying Fundamental Goals from Objects in a Scenario to Facilitate System Introduction	276
<i>Yoshihide Chubachi and Haruhiko Kaiya</i>	
Computer Literacy Education: Challenges in Multicultural Environments: A View on Japanese University Environment	278
<i>Simona Vasilache</i>	
FATDOG: Hadoop Based Test Data Generation Tool for RESTful Web Service	280
<i>Jing Liu and Wenjie Chen</i>	
A Secure and Lightweight IoT Device Remote Monitoring and Control Mechanism Using DNS	282
<i>Yong Jin, Masahiko Tomoishi, and Nariyoshi Yamai</i>	
Development of the Edge Computing Platform Based on Functional Modulation Architecture	284
<i>Tohru Kondo, Hidenobu Watanabe, and Toshihiro Ohigashi</i>	

Traceability Link Mining — Focusing on Usability	286
<i>Yukiya Yazawa, Shinpei Ogata, Kozo Okano, Haruhiko Kaiya, and Hironori Washizaki</i>	

FCN: The 1st IEEE International COMPSAC Workshop on Fog Computing and Networking

FCN Session 1

On the Deployment of Healthcare Applications over Fog Computing Infrastructure	288
<i>Orestis Akrivopoulos, Ioannis Chatzigiannakis, Christos Tselios, and Athanasios Antoniou</i>	
Towards Container Orchestration in Fog Computing Infrastructures	294
<i>Saiful Hoque, Mathias Santos de Brito, Alexander Willner, Oliver Keil, and Thomas Magedanz</i>	

SIS-SS: The 1st IEEE International COMPSAC Workshop on Smart IoT Sensors and Social Systems for eHealth and Well-being Applications

Session 1: Security, IoT Systems and Devices for eHealth

Performance Assessment of BLE Nano BAN Micro-Infrastructures	300
<i>Luca Vollero and Marco Sabatini</i>	
Cybersecurity of Wearable Devices: An Experimental Analysis and a Vulnerability	
Assessment Method	304
<i>Matteo Langone, Roberto Setola, and Javier Lopez</i>	
LoRaWAN as an e-Health Communication Technology	310
<i>M. Talha Buyukakkaslar, Mehmet Ali Erturk, Muhammed Ali Aydin, and Luca Vollero</i>	
Contactless Detection of ECG Signals: Sensor Architecture and Simulation	314
<i>Marco Santonico, Alessandro Zompanti, Giorgio Pennazza, Giuseppe Ferri, Francesca Romana Parente, and Mario Benassai</i>	
Security in Cross - Border Medical Data Interchange: A Technical Analysis and	
a Discussion of Possible Improvements	317
<i>Raffaele Martino, Salvatore D'Antonio, Luigi Coppolino, and Luigi Romano</i>	

CDS: The 5th IEEE International COMPSAC Workshop on Consumer Devices and Systems

CDS Session 1

Design of Common Software Architecture as Base for Application Generator	
and Meta-Generator for Interactive Systems	323
<i>Atsushi Esaka, Masami Noro, and Atsushi Sawada</i>	
Dynamically Exposing and Controlling Physical Devices by Expanding Web of Things	
Scheme	329
<i>Takuya Sakamoto, Hidenobu Ito, and Kazuaki Nimura</i>	

Wrist Player: A Smartwatch Gesture Controller for Smart TVs	336
<i>Mateus M. Luna, Thyago P. Carvalho, Fabrizzio Alphonsus A. M. N. Soares, Hugo A. D. Nascimento, and Ronaldo M. Costa</i>	
A Collusion-Resilient Hybrid P2P Framework for Massively Multiplayer Online Games	342
<i>Kazuma Matsumoto and Yasuo Okabe</i>	

CDS Session 2

On-Demand Barrier-Free Street View System Using Sensor Information from General-Purpose Wheelchair Users	348
<i>Kenichi Arai, Takuya Tateishi, Toru Kobayashi, and Noboru Sonehara</i>	
Visualization Method for Bicycle Rider Behavior Analysis Using a Smartphone	354
<i>Hajime Kato, Yuto Sakajyo, and Shigeo Kaneda</i>	
Visualization Method Using Probe Bicycle to Analyze Bicycle Rider's Control Behavior	360
<i>Ryoichi Takahashi, Kazuki Miki, and Shigeo Kaneda</i>	
VID: Virtual Information Desk	366
<i>Navid Seidi, Farshad Eshghi, and Manoochehr Kelarestaghi</i>	

DSCAC: The 1st IEEE International COMPSAC Workshop on Data Science Challenges in Algorithm and Complexity

DSCAC Session 1

Finding All Breadth First Full Spanning Trees in a Directed Graph	372
<i>Hoda Khalil and Yvan Labiche</i>	
Incremental Learning from Multi-level Monitoring Data and Its Application to Component Based Software Engineering	378
<i>Salman Taherizadeh and Vlado Stankovski</i>	

Session 2: Data Science Challenges in Agriculture, Climate, Food

IoT Solutions for Precision Farming and Food Manufacturing: Artificial Intelligence Applications in Digital Food	384
<i>Rob Dolci</i>	

Session 3: Data Science Challenges in Finance and Economics

Detection of Irregularities and Rips by Finding Critical Points of Morse Theory — Preliminary Results on Analysis on Sales Data	386
<i>Hiroyuki Sato, Yoshihiro Seino, Takanori Ogata, and Tatsuya Shirakawa</i>	
Application of Complex Hilbert Principal Component Analysis to Financial Data	391
<i>Wataru Souma, Hiroshi Iyetomi, and Hiroshi Yoshikawa</i>	
Detrending Moving Average Algorithm: Quantifying Heterogeneity in Financial Data	395
<i>Linda Ponta, Anna Carbone, and Silvano Cincotti</i>	

QUORS: The 11th IEEE International COMPSAC Workshop on Quality Oriented Reuse of Software

Session 1: Efficiency and Quality in Clouds

The Impact of Database Layer on Auto-Scaling Decisions in a 3-Tier Web Services	
Cloud Resource Provisioning	401
<i>Ali Yadavar Nikravesh, Samuel A. Ajila, and Chung-Horng Lung</i>	
ESBSC: Energy-Aware Service Brokering Strategy in Clouds	407
<i>Feng Ma, Xiaodong Liu, Ying Yang, Wei Yao, Jinjin Cai, and Fang Wang</i>	
Automated Constraint-Based Multi-tenant SaaS Configuration Support Using XML	
Filtering Techniques	413
<i>Azadeh Etedali, Chung-Horng Lung, Samuel Ajila, and Igor Veselinovic</i>	

Session 2: Emerging Reuse

Developing a Creative Travel Management System Based on Software Reuse	
and Abstraction Techniques	419
<i>Sicong Ma, Hongji Yang, and Meiyu Shi</i>	
A Creative Approach to Reusing Data and Generating Knowledge in Enterprise	
Systems	425
<i>Lin Zou, Qinyun Liu, Hongming Che, Hongji Yang, and Hua Zhou</i>	
Towards Requirements Reuse by Implementing Traceability in Agile Development	431
<i>Randa Elamin and Rasha Osman</i>	

Session 3: Software and System Evolution 1

Improving Workflow Anomaly Detection with a C-Tree	437
<i>Feng-Jian Wang, Alex Chang, and Tennyson Lu</i>	
An Approach Based on Structural Differences to Expedite Applying OSS Updates	
to Products	445
<i>Masahiro Fukuyori, Ryuichi Umekawa, Hiroshi Fujino, Junya Yamaguchi, and Kota Ariyama</i>	
Executable Domain-Specific Modelling Based on Domain Spaces	451
<i>Qing Duan, Junhui Liu, Dongdai Zhou, Feng Yu, and Hongji Yang</i>	

Session 4: Softare and System Evolution 2

Combining Neutron and OpenDaylight for Management of Networking	457
<i>Lu Wang, HongWei Ruan, Hua Li, and Qi Liu</i>	
DeDuCT: A Data Dependence Based Concern Tagger for Modularity Analysis	463
<i>Andrea Fornaia and Emiliano Tramontana</i>	
Towards Service-Oriented Design of Hybrid Systems Modeled in Simulink	469
<i>Timm Liebrenz, Paula Herber, Thomas Göthel, and Sabine Glesner</i>	

BIOT: The 4th IEEE International COMPSAC Workshop on Big Data Management for the Internet of Things

Session 1: IoT Architecture and Algorithms

An IoT Architecture for Personalized Recommendations over Big Data Oriented Applications	475
<i>Georgios Palaiokrassas, Ilias Karlis, Antonios Litke, Vassilios Charlaftis, and Theodora Varvarigou</i>	

Improving the Prediction Accuracy of Decision Tree Mining with Data Preprocessing	481
<i>Priyanga Chandrasekar, Kai Qian, Hossain Shahriar, and Prabir Bhattacharya</i>	

STPSA: The 12th IEEE International COMPSAC Workshop on Security, Trust and Privacy for Software Applications

STPSA Session 1

Data-Oriented Instrumentation against Information Leakages of Android Applications	485
<i>Cong Sun, Pengbin Feng, Teng Li, and Jianfeng Ma</i>	
A Lightweight Multi-receiver Encryption Scheme with Mutual Authentication	491
<i>Ei Khaing Win, Tomoki Yoshihisa, Yoshimasa Ishi, Tomoya Kawakami, Yuuichi Teranishi, and Shinji Shimojo</i>	
Access Control Model for the Inference Attacks with Access Histories	498
<i>Kinoshita Hirotsugu and Morizumi Tetsuya</i>	
An Iris-Based Authentication Framework to Prevent Presentation Attacks	504
<i>Hossain Shahriar, Hisham Haddad, and Mahbubul Islam</i>	

STPSA Session 2

Addressing Security Issues in the eHealth Domain Relying on SIEM Solutions	510
<i>Luigi Coppolino, Salvatore D'Antonio, Luigi Romano, Luigi Sgaglione, and Mariacarla Staffa</i>	
Blockchain as an Audit-Able Communication Channel	516
<i>Shigeya Suzuki and Jun Murai</i>	
Trust as Soft Security for Self-Adaptive Systems: A Literature Survey	523
<i>Hyo-Cheol Lee and Seok-Won Lee</i>	

UCDAS: The 4th IEEE International COMPSAC Workshop on User Centered Design and Adaptive Systems

UCDAS Session 1

Integrating Goal Models and Problem Frames for Requirements Analysis of Self-Adaptive CPS	529
<i>Deshuai Han, Jianchun Xing, Qiliang Yang, Juelong Li, Xiaobing Zhang, and Ying Chen</i>	

A Similarity-Based Approach to Recognizing Voice-Based Task Goals in Self-Adaptive Systems	536
<i>Xiaobing Zhang, Qiliang Yang, Jianchun Xing, Deshuai Han, and Ying Chen</i>	
Talis — A Design Study for a Wearable Device to Assist People with Depression	543
<i>Dirk Siegmund, Laura Chiesa, Oliver Hörr, Frank Gabler, Andreas Braun, and Arjan Kuijper</i>	

UCDAS Session 2

Method for Text Entry in Smartwatches Using Continuous Gesture Recognition	549
<i>Thamer Hobylon Nascimento, Fabrizzio Alphonsus A. M. N. Soares, Pouang Polad Irani, Leandro Luíz Galdino de Oliveira, and Anderson da Silva Soares</i>	
Tele-operation of Robot Teams: A Comparison of Gamepad-, Mobile Device and Hand Tracking-Based User Interfaces	555
<i>Stefano Bonaiuto, Alberto Cannavò, Giovanni Piumatti, Gianluca Paravati, and Fabrizio Lamberti</i>	
The Problem of Cognitive Load in GUI's: Towards Establishing the Relationship between Cognitive Load and Our Executive Functions	561
<i>Andrés Mejía Figueroa and Reyes Juárez-Ramírez</i>	

NETSAP: The 7th IEEE International COMPSAC Workshop on Network Technologies for Security, Administration and Protection

NETSAP Session 1

Making DNS Servers Resistant to Cyber Attacks: An Empirical Study on Formal Methods and Performance	566
<i>Barry S. Fagin, Bradley Klanderman, and Martin C. Carlisle</i>	
Secure Double-Layered Defense against HTTP-DDoS Attacks	572
<i>Mohamad Samir A. Eid and Hitoshi Aida</i>	
Application of Hidden Markov Model in SQL Injection Detection	578
<i>Peng Li, Lei Liu, Jing Xu, Hongji Yang, Liying Yuan, Chenkai Guo, and Xiujuan Ji</i>	

NETSAP Session 2

TRUST-CAP: A Trust Model for Cloud-Based Applications	584
<i>Eslam G. Abdallah, Mohammad Zulkernine, Yuan Xiang Gu, and Clifford Liem</i>	
Detecting and Classifying Android PUAs by Similarity of DNS queries	590
<i>Mitsuhiko Hatada and Tatsuya Mori</i>	

CORCS/IEESD: The 6th IEEE International COMPSAC Workshop on Component-based Design of Resource Constrained Systems (CORCS) and IEEE International COMPSAC Workshop on Industrial Experience in Embedded System Design (IEESD)

Message from CORCS-IEESD 2017 Workshop Chairs 596

Cristina Seceleanu, Detlef Streitferdt, Tiberiu Seceleanu, and Philipp Nenninger

Session 1: Embedded and Distributed Systems Development

System Level Partitioning for Embedded Systems 597

G. Sapienza, N. Meli, J. Eriksson, R. Jansson, T. Seceleanu, and I. Crnkovic

Adaptive Resource Allocation of Multiple Servers for Service-Based Systems in Cloud Computing 603

Siqian Gong, Beibei Yin, Wenlong Zhu, and Kai-Yuan Cai

Simulation Driven Development of Distributed Systems — Improving the System Development Process Using the Example of the German Automatic Toll System 609

Tommy Baumann and Bernd Pfitzinger

SSERV: The 4th IEEE International COMPSAC Workshop on Social Services through Human and Artificial Agent Models

Session 1: Application

Searching Promising Researchers through Network Centrality Measures of Co-author Networks of Technical Papers 615

Masanori Fujita, Hiroto Inoue, and Takao Terano

Feature Representation Extraction Method of Hotel Reviews Using Co-occurrence Restriction and Dependency Graph 619

Koji Tanaka, Koichi Tsujii, Takashi Ikoma, Akiyuki Sekiguchi, and Kazuhiko Tsuda

Promoting Environmental Education Using a Multilingual Environment: Manufacturing Soap from Waste Oil 625

Bo Wang, Hiroshi Suzuki, Yuqi Liao, Yuya Ieiri, and Reiko Hishiyama

SSERVE Session 2

Corroboration Effect of Current Net Earnings and Management's Net Earnings Forecasts in Japan's Corporate Bond Market 631

Hiroaki Jotaki, Hiroshi Takahashi, Yasuo Yamashita, and Takao Terano

A Walk Rally Application to Motivate Users to Visit Potential Sightseeing Resources 637

Yuya Ieiri, Yuu Nakajima, Ryota Ayaki, and Reiko Hishiyama

A Comparative Study Using Discriminant Analysis on a Questionnaire Survey Regarding Project Managers' Cognition and Team Characteristics 643

Ayako Masuda, Tohru Matsuodani, and Kazuhiko Tsuda

Online Shopping Frauds Detecting System and Its Evaluation 649

Kenichi Yoshida, Kazuhiko Tsuda, Setsuya Kurahashi, and Hiroki Azuma

Session 3: Method

Early Signals of Trending Rumor Event in Streaming Social Media	654
<i>Shihan Wang, Izabela Moise, Dirk Helbing, and Takao Terano</i>	
Agent-Based Urban Dynamics Simulation to Analyze Effects of Street Attractiveness and Tramway for an Urban Sprawl	660
<i>Hideyuki Nagai and Setsuya Kurahashi</i>	
An Analysis of Multi-language Simultaneous Display in the Translation System	666
<i>Mizuki Sato and Reiko Hishiyama</i>	

eIoT: The 1st IEEE International COMPSAC Workshop on Embedded Internet of Things

Session 1: IoT Application, Architecture and Protocols

SocICoAP: Social Interaction with Supplementary Sensors and Actuators through CoAP in Smartphones	672
<i>Cristian Martín, Jaime Chen, Manuel Díaz, Ana Reyna, and Bartolomé Rubio</i>	
Optimizing RPL Objective Function for Mobile Low-Power Wireless Networks	678
<i>Ifeoma Helen Urama, Hossein Fotouhi, and Mohammad Mahmoud Abdellatif</i>	
IoT Agent Platform Mechanism with Transparent Cloud Computing Framework for Improving IoT Security	684
<i>Ikuo Nakagawa and Shinji Shimojo</i>	
A Wireless Early Prediction System of Cardiac Arrest through IoT	690
<i>Yosuf ElSaadany, AKM Jahangir A. Majumder, and Donald R. Ucci</i>	

OER: The 2nd IEEE International Workshop on Open Educational Resources for Computer Science & Information Technology

Message from OER 2017 Workshop Organizers	696
<i>Henry Chan and Edmundo Tovar</i>	

Session 1: Communities Based on OERs

MERLOT — A Reliable Framework for OER	697
<i>Eli Shmueli</i>	
Promoting MERLOT Communities Based on OERs in Computer Science and Information Systems	700
<i>Edmundo Tovar, Henry Chan, and Sorel Reisman</i>	
Developing an Open Educational Resource: Reflections on a Student-Staff Collaboration	707
<i>Dave Towey, David Foster, Filippo Gilardi, Paul Martin, Andrew White, Yiru Jiang, Yichen Pan, and Yu Qu</i>	

Session 2: Infrastructure to Adopt OERs

A Knowledge-Driven Web Tutoring System Framework for Adaptive and Assessment-Driven Open-Source Learning	712
<i>Maria Sette, Lixin Tao, and Ning Jiang</i>	

SIMICE: The 3rd IEEE International COMPSAC Workshop on Secure Identity Management in the Cloud Environment

SIMICE Session 1

Verifiable Delegated Authorization for User-Centric Architectures and an OAuth2 Implementation	718
<i>Luca Ferretti, Mirco Marchetti, and Michele Colajanni</i>	
A Novel Binarization Scheme for Real-Valued Biometric Feature	724
<i>Jialiang Peng and Bian Yang</i>	
A Threshold-Based Authentication System Which Provides Attributes Using Secret Sharing	730
<i>Tomohiro Ito, Daisuke Kotani, and Yasuo Okabe</i>	

SIMICE Session 2

Flexible Key Revocation and Access Control for a Privacy-Protecting Cloud CBIR System	738
<i>Hao Liu and Hideaki Goto</i>	
Enhancing Breeder Document Long-Term Security Using Blockchain Technology	744
<i>Nicolas Buchmann, Christian Rathgeb, Harald Baier, Christoph Busch, and Marian Margraf</i>	

SSMSC: The 1st IEEE International COMPSAC Workshop on Smart and Sustainable Mobility in Smart Cities

Session 1: Optimization in Smart Mobility

Ant Colony Optimisation and Geolocation Technologies for the Transportation Assignment Problem: Use of ACO and Geolocation Technologies for Performance Improvement and Test of Local Public Transport	749
<i>Fabio Pompei</i>	
Modelling Urban Transport Sector: A Methodology Based on OSeMOSYS Model Generator	754
<i>Daniele Grosso, Raffaella Gerboni, and Dario Cotugno</i>	
Multi Period Assignment Problem for Social Engagement and Opportunistic IoT	760
<i>Edoardo Fadda, Dario Mana, Guido Perboli, and Roberto Tadei</i>	
The Impact of Combining Inbound and Outbound Demand in City Logistics Systems	766
<i>Pirmin Fontaine, Teodor Gabriel Crainic, Ola Jabali, and Walter Rei</i>	

Session 2: Smart Mobility: Business Models and Users Behaviors

Car-Sharing: Current and Potential Members Behavior Analysis after the Introduction of the Service	771
<i>Guido Perboli, Brunella Caroleo, and Stefano Musso</i>	
One-Way Free Floating Car-Sharing: Applying Vehicle-Generated Data to Assess the Market Demand Potential of Urban Zones	777
<i>Y. M. Chianese, A. Avenali, R. Gambuti, and L. Palagi</i>	
Business Modeling of a City Logistics ICT Platform	783
<i>Alberto De Marco, Giulio Mangano, Giovanni Zenezini, Anna Corinna Cagliano, Guido Perboli, Mariangela Rosano, and Stefano Musso</i>	
Assessing the Impacts of Electric Vehicles Uptake: A System Dynamics Approach	790
<i>Brunella Caroleo, Elisa Pautasso, Michele Osella, Enrico Palumbo, and Enrico Ferro</i>	
Author Index - Workshops	796