

2017 IEEE International Conference on Smart Computing (SMARTCOMP 2017)

**Hong Kong, China
29-31 May 2017**



**IEEE Catalog Number: CFP1716Z-POD
ISBN: 978-1-5090-6518-9**

**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:	CFP1716Z-POD
ISBN (Print-On-Demand):	978-1-5090-6518-9
ISBN (Online):	978-1-5090-6517-2

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

CURRAN ASSOCIATES INC.
proceedings
.com

SMARTCOMP 2017 Table of Contents

Message from General and Program Co-chairs	xiii
Organizing Committee	xv
Technical Program Committee	xvii
Keynotes.....	xix
Session 1A: Deep Learning and Applications	
CRNN: A Joint Neural Network for Redundancy Detection.....	1
<i>Xinyu Fu, Eugene Ch'ng, Uwe Aickelin, and Simon See</i>	
Deep Defense: Identifying DDoS Attack via Deep Learning.....	9
<i>Xiaoyong Yuan, Chuanhuang Li, and Xiaolin Li</i>	
Identifying Carotid Plaque Composition in MRI with Convolutional Neural Networks.....	17
<i>Yuxi Dong, Yuchao Pan, Xihai Zhao, Rui Li, Chun Yuan, and Wei Xu</i>	
Session 1B: Intelligent Transportations and Smart City 1	
Unsupervised Mechanisms for Optimizing On-Time Performance of Fixed Schedule Transit Vehicles	25
<i>Fangzhou Sun, Chinmaya Samal, Jules White, and Abhishek Dubey</i>	
Delay-Aware Design, Analysis and Verification of Intelligent Intersection Management.....	33
<i>Bowen Zheng, Chung-Wei Lin, Hengyi Liang, Shinichi Shiraishi, Wenchao Li, and Qi Zhu</i>	
MetroTime: Travel Time Decomposition under Stochastic Time Table for Metro Networks.....	41
<i>Haengju Lee, Desheng Zhang, Tian He, and Sang H. Son</i>	
Session 2A: Best Paper Candidates	
Ubiquitous Tracking Using Motion and Location Sensor With Application to Smartphone	49
<i>Lei Wang, Li Feng, and Maciej Zawodniok</i>	
An Exploratory Study of Marking Menu Selection by Visually Impaired Participants	57
<i>Nem Khan Dim, Kibum Kim, and Xianghsi Ren</i>	
BitID: Easily Add Battery-Free Wireless Sensors to Everyday Objects	64
<i>Tengxiang Zhang, Nicholas Becker, Yuntao Wang, Yuan Zhou, and Yuanchun Shi</i>	

Session 2B: Distributed Smartness

Multi-Client Searchable Encryption over Distributed Key-Value Stores 72
Wanyu Lin, Xu Yuan, Baochun Li, and Cong Wang

Real-Time Ambient Noise Subsurface Imaging in Distributed Sensor Networks..... 79
*Maria Valero, Jose Clemente, Goutham Kamath, Yao Xie, Fan-Chi Lin,
and WenZhan Song*

Towards Distributed Machine Learning in Shared Clusters:
A Dynamically-Partitioned Approach..... 87
*Peng Sun, Yonggang Wen, Ta Nguyen Binh Duong,
and Shengen Yan*

Session 3A: Intelligent Transportations and Smart City 2

User Engagement Engine for Smart City Strategies 93
*Claudio Badii, Pierfrancesco Bellini, Daniele Cenni,
Angelo Difino, Michela Paolucci, and Paolo Nesi*

A Speed Hump Sensing Approach to Global Positioning in Urban Cities
without GPS Signals..... 100
Qixia Chen, Dongdong Ding, Xu Wang, Alex X. Liu, and Ali Munir

Session 3B: Cloud Computing and Datacenters

Hierarchical Demand Response for Colocation Data Centers..... 108
Huiting Xu, Xi Jin and Qingxu Deng

Quantitative Availability Analysis of Hierarchical Datacenter under
Power Oversubscription..... 116
Zhiguang Tang, Haihang Zhou, Yujin Zhu, Run Tian, and Jianguo Yao

Session 4A: Smart Computing and Applications

Transferring an Interactive Display Service to the Virtual Reality..... 124
Jens Naber, Christian Krupitzer, and Christian Becker

EventRec: Personalized Event Recommendations for Smart Event-based
Social Networks 132
Tunde J. Ogundele, Chi-Yin Chow, and Jia-Dong Zhang

Participant Selection for Information Diffusion based on Topic
and Emotion Preference Learning..... 140
Zhiwen Yu, Fei Yi, Chao Ma, Bin Guo, and Zhu Wang

Session 4B: Smart Computing Foundations, Modeling and Algorithms

Accurate Models of Energy Harvesting for Smart Environments	148
<i>Greg Jackson, Sokratis Kartakis, and Julie McCann</i>	
Consensus in Smart Computing Systems	155
<i>Zhiwei Yang, Weigang Wu, Huaguan Li, and Yu Zhou</i>	
Service Compositions in Challenged Mobile Environments Under Spatiotemporal Constraints	163
<i>Daisuke Kasamatsu, Mohan Kumar, and Peizhao Hu</i>	

Session 5A: Wireless Networks and Protocols

A High Throughput Reader Scheduling Algorithm for Large RFID Systems in Smart Environments	171
<i>Shigeng Zhang, Danming Jiang, Qing Zou, Jianxin Wang, and Xuan Liu</i>	
ELIMO: Eliminating Channel Feedback from MIMO	179
<i>Yongsen Ma, Gang Zhou, and Shan Lin</i>	
Transmit Only: An Ultra Low Overhead MAC Protocol for Dense Wireless Systems	187
<i>Bernhard Firner, Yanyong Zhang, , Richard Howard, Richard Martin, Narayan Mandayam, Junichiro Fukuyama, and Chenren Xu</i>	
STOOP: Stochastically-Dominant Access Point Selection in Enterprise WLANs	195
<i>Yu Bai, Mehmet C. Vuran, Demet Batur, and Steve Goddard</i>	

Session 5B: Mobile Sensing and Activity Monitoring

SALM: Smartphone-based Identity Authentication Using Lip Motion Characteristics	203
<i>Yaoxuan Yuan, Jizhong Zhao, Zhe Zhang, Wei Xi, Chen Qian, Xiaobin Zhang, and Zhi Wang</i>	
FishBuddy: Promoting Student Engagement in Self-Paced Learning through Wearable Sensing	211
<i>Jingjing Chen, Bin Zhu, Olle Balter, Jianliang Xu, Weiwen Zou, Anders Hedman, Rongchao Chen, and Mengdie Sang</i>	
FitBeat: A Lightweight System for Accurate Heart Rate Measurement during Exercise	220
<i>Linlin Tu, Jun Huang, Chongguang Bi, and Guoliang Xing</i>	
Challenges in Studying Falls of Community-dwelling Older Adults in the Real World	228
<i>Xin Hu, Rahav Dor, Steven Bosch, Anita Khoong, Jing Li, Susan Stark, and Chenyang Lu</i>	

PhD Forum Table of Contents

PhD Forum: Real-time Lane-Vehicle Detection for Advanced Driver Assistance on Mobile Devices.....	235
<i>Tianchen Wang</i>	
PhD Forum: A Novel Cyber Network Fault Diagnosis Scheme for Cyber-Physical Systems	237
<i>Shanshan Bi</i>	
PhD Forum: Improving the Security for Storing the Big Data in Cloud Environment.....	239
<i>Jayachander Surbiryala</i>	
PhD Forum Abstract: Data Driven EV charging in Smart Neighbourhood	241
<i>Songpu Ai</i>	
PhD Forum: Forecasting Public Transit Using Neural Network Models.....	243
<i>Cristina Heghedus</i>	
PhD Forum: Deep Learning-based Real-Time Malware Detection with Multi-Stage Analysis.....	245
<i>Xiaoyong Yuan</i>	
PhD Forum: Robust Sensing and Analytics in Urban Environment.....	247
<i>Fangzhou Sun</i>	
PhD Forum: Toward a Human-in-the-Loop Smart Ridesharing System with Self-Driving Technologies	249
<i>San Yeung</i>	
PhD Forum: Recognizing Human Posture from Time-Changing Wearable Sensor Data Streams	251
<i>Wenbin Zhang</i>	
PhD Forum: Human Activity Recognition in Smart Environments	253
<i>Alec Bayliff</i>	
PhD Forum: Multimodal IoT and EMR based Smart Health Application for Asthma Management in Children.....	255
<i>Utkarshani Jaimini</i>	

WIP/Demo Poster Session Table of Contents

Mining Big Building Operational Data for Building Cooling Load Prediction and Energy Efficiency Improvement	257
<i>Fu Xiao, Shengwei Wang, and Cheng Fan</i>	
I am the UAV: A Wearable Approach for Manipulation of Unmanned Aerial Vehicle	260
<i>Yijia Lu, Fei Han, Lei Xie, Yafeng Yin, Congcong Shi, and Sanglu Lu</i>	
Certia: Certifying Interface Automata for Cyber-Physical Systems.....	263
<i>Cong Sun, Qingsong Yao, and Jianfeng Ma</i>	
RoomScan: Indoor Layout Reconstruction via Reflective Path.....	266
<i>Ping Li, Panlong Yang and Yubo Yan</i>	
Is This Side Up? Detecting Upside-down Exception With Passive RFID	269
<i>Jia Liu, Haipeng Dai, Yingli Yan, Xiaocong Zhang, Xingyu Chen, and Lijun Chen,</i>	
Towards an MCDM-based evaluation framework for regression algorithms	271
<i>Di Yao and Kevin Kam Fung Yuen</i>	
Identity Theft Detection in Mobile Social Networks Using Behavioral Semantics	274
<i>Cheng Wang, Bo Yang, and Jing Luo</i>	
LiReT: An Fine-Grained Self-Adaption Device-Free Localization with Little Human Effort.....	277
<i>Juan He, Yue Hu, Xinyan Liu, Chen Liu, Yao Peng, and Xianjia Meng</i>	
Synthesizing Vehicle-to-Vehicle Communication Trace for VANET Research.....	280
<i>Feng Lv, Hongzi Zhu, Shan Chang, and Mianxiong Dong</i>	

SSC 2017 Table of Contents

3rd IEEE International Workshop on Sensors and Smart Cities

Message from General and Program Co-chairs	xxii
Organizing Committee	xxiii
Keynote.....	xxiv

Technical Session 1

Fog Computing for the Internet of Mobile Things: issues and challenges	283
<i>Carlo Puliafito, Enzo Mingozzi, and Giuseppe Anastasi</i>	
Extending Bluetooth Low Energy PANs to Smart City scenarios.....	289
<i>Anup Kiran Bhattacharjee, Dario Bruneo, Salvatore Distefano, Francesco Longo, Giovanni Merlino, and Antonio Puliafito</i>	
Polite Broadcast Gossip for IOT Configuration Management.....	295
<i>Michael Breza, and Julie McCann</i>	
ECG-Based Driver Distraction Identification using Wavelet Packet Transform and Discriminative Kernel-based Features.....	301
<i>Shantanu Deshmukh and Omid Dehzangi</i>	
Urban Heartbeat: From Modelling to Applications.....	308
<i>Ali Hasani and Roozbeh Jafari</i>	

Technical Session 2

Early Prediction of LBW Cases via Minimum Error Rate classifier: A Statistical Machine Learning Approach.....	316
<i>Anisha R. Yarlapati, Sudeepa Roy Dey, and Snehanshu Saha</i>	
A Context-aware Strategy To Properly Use IoT-Cloud Services.....	322
<i>Maurizio Giacobbe, Antonio Puliafito, Riccardo Di Pietro, and Marco Scarpa</i>	
Performance Evaluation the 6top Protocol and Analysis of its Interplay with Routing	328
<i>Francesca Righetti, Carlo Vallati, Giuseppe Anastasi, and Sajal Das</i>	

SMARTMM 2017 Table of Contents

1st IEEE International Workshop on Smart Multimedia

Message from General and Program Co-chairs	xxv
Organizing Committee	xxvi
Keynote.....	xxvii
Image-Based Video Retrieval Using Deep Feature	334
<i>Mao Wang, Yuewei Ming, Qiang Liu, and Jianping Yin</i>	
Learning Generic Features from DEH Channels for Object Proposals Generation.....	340
<i>Yiliu Feng, Zhengfa Liang, and Hengzhu Liu</i>	
Minimum Number of Transmission Slots in D2D-assisted Wireless Coded Broadcast	346
<i>Cheng Zhan, Zhe Wen, and Liyue Zhu</i>	
Adaptive Video Streaming in Hybrid Landslide Detection System with D-S Theory.....	352
<i>Zhi Liu, Kenji Kanai, Masaru Takeuchi, Toshitaka Tsuda, and Hiroshi Watanabe</i>	
Smart Airplane Seat Assignment System for Passengers' Multimedia Preferences	358
<i>Jing Qiu, Chih-Fu Wu, Aihua Wu, and Ling Liu</i>	
Building TensorFlow Applications in Smart City Scenarios	364
<i>Davide Mulhari, Antonino Longo Minnolo, and Antonio Puliafito</i>	
A Smart Map Sharing and Preloading Scheme for Mobile Cloud Gaming in D2D Networks.....	369
<i>Ziqiao Lin, Zehua Wang, Wei Cai, and Victor Leung</i>	

SMARTSYS 2017 Table of Contents

2nd IEEE Workshop on Smart Service Systems

Message from Program Co-chairs	xxviii
Organizing Committee	xxix
Keynote.....	xxx
Session 1: Smart IoT Services	
Role-based Models for Building Adaptable Collaborative Smart Service Systems.....	375
<i>Markus Wutzler, Martin Weißbach, and Thomas Springer</i>	
A Fast Algorithm for Detecting Hidden Objects by Smart Mobile Robots.....	381
<i>T.C.E. Cheng, C.T. Ng, Eugene Levner, and Boris Kriheli</i>	
SpeedPro: A Predictive Multi-Model Approach for Urban Traffic Speed Estimation.....	387
<i>Chinmaya Samal, Fangzhou Sun, and Abhishek Dubey</i>	
Session 2: Smart Environments	
An Activity-Embedding Approach for Next-Activity Prediction in a Multi-User Smart Space.....	393
<i>Younggi Kim, Jihoon An, Minseok Lee, and Younghee Lee</i>	
Spectral-Temporal LED Lighting Modules for Reproducing Daily and Seasonal Solar Circadian Rhythmicities.....	399
<i>Joshua Bohar, Gustavo Fernandes, and Jimmy Xu</i>	
Context-Aware Wireless Sensors for IoT-Centeric Energy-Efficient Campuses	405
<i>Najem Naji, Driss Ben Haddou, Mohamed Riduan Abid, Hassan Darhmaoui, Nissrine Krami, and Ouadoudi Zytoune</i>	
Analyzing Social Media Texts and Images to Assess the Impact of Flash Floods in Cities.....	411
<i>Bipendra Basnyat, Amrita Anam, Neha Singh, Aryya Gangopadhyay, and Nirmalya Roy</i>	

BITS 2017 Table of Contents

1st IEEE International Workshop on Big Data and IoT Security in Smart Computing

Message from General Co-chairs xxxi

Organizing Committeexxxii

Session 1: Cryptography and Authentication in Theory

A Homomorphic Signature Scheme for Quadratic Polynomials..... 417
Seiko Arita and Shunji Kozaki

Short CCA-Secure Ciphertext-Policy Attribute-Based Encryption 423
Hiroaki Anada and Seiko Arita

Anonymous Authentication Scheme with Decentralized Multi-authorities 429
Hiroaki Anada and Seiko Arita

Session 2: Applied Secure Systems in Smart Computing

Fully Homomorphic Encryption for Classification in Machine Learning 435
Seiko Arita and Shota Nakasato

Differentially Private Semi-Supervised Classification..... 439
Xu Long and Jun Sakuma

Anomaly Detection with Attribute Conflict Identification in
Bank Customer Data 445
Yuan Wang and Vincent Ng

Session 3: Big Data Security in Smart Computing

A Decentralized System of Genome Secret Search Implemented
with Fully Homomorphic Encryption 451
Yuri Yamamoto and Masato Oguchi

Private Substring Search on Homomorphically Encrypted Data..... 457
Yu Ishimaki, Hiroki Imabayashi, and Hayato Yamana

FeNCI 2017 Table of Contents

1st IEEE International Workshop on Federated Networking, Clouds and IoT

Message from General and Program Co-chairs	xxxiii
Organizing Committee	xxxiv
End-to-End Security Architecture for Federated Cloud and IoT Networks.....	463
<i>Philippe Massonet, Laurent Deru, Amel Achour, Sebastien Dupont, Anna Levin, and Massimo Villari</i>	
Orchestrated Multi-Cloud Application Deployment in OpenStack with TOSCA	469
<i>Giuseppe Tricomi, Alfonso Panarello, Giovanni Merlino, Francesco Longo, Dario Bruneo, and Antonio Puliafito</i>	
Network Monitoring in Federated Cloud Environment	475
<i>Anna Levin, Konstantin Dorfman, Dean Lorenz, Sylvain Afchain, and Philippe Massonet</i>	
Deployment-Time Multi-Cloud Application Security	481
<i>Craig Sheridan, Philippe Massonet, and Andrew Phee</i>	