

2017 IEEE/ACM Second International Conference on Internet-of-Things Design and Implementation (IoTDI 2017)

**Pittsburgh, Pennsylvania, USA
18-21 April 2017**



**IEEE Catalog Number: CFP17F07-POD
ISBN: 978-1-4673-9146-7**

**Copyright © 2017, The Association for Computing Machinery (ACM)
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:	CFP17F07-POD
ISBN (Print-On-Demand):	978-1-4673-9146-7
ISBN (Online):	978-1-4503-4966-6

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

2017 IEEE/ACM Second International Conference on Internet-of-Things Design and Implementation

IoTDI 2017

Table of Contents

Message from the General Co-Chairs	xi
Message from the Program Co-Chairs.....	xiii
Organizing Committee.....	xiv
Program Committee	xvi
Sponsors and Supporters	xvii

Information-centric Networking for Things

Breaking Out of the Cloud: Local Trust Management and Rendezvous in Named Data Networking of Things	3
<i>Wentao Shang, Zhehao Wang, Alexander Afanasyev, Jeff Burke, and Lixia Zhang</i>	
Secure Information Sharing among Autonomous Vehicles in NDN.....	15
<i>Muktadir Chowdhury, Ashlesh Gawande, and Lan Wang</i>	
ADN: An Information-Centric Networking Architecture for the Internet of Things.....	27
<i>J.J. Garcia-Luna-Aceves</i>	
CoMPES: A Command Messaging Service for IoT Policy Enforcement in a Heterogeneous Network.....	37
<i>Jared Hall and Razib Iqbal</i>	

Managing Things in Physical and Social Spaces

SeleCon: Scalable IoT Device Selection and Control Using Hand Gestures	47
<i>Amr Alanwar, Moustafa Alzantot, Bo-Jhang Ho, Paul Martin, and Mani Srivastava</i>	
Gait-Watch: A Context-Aware Authentication System for Smart Watch Based on Gait Recognition	59
<i>Weitao Xu, Yiran Shen, Yongtuo Zhang, Neil Bergmann, and Wen Hu</i>	
Empowering End Users for Social Internet of Things.....	71
<i>Ji Eun Kim, Xiangmin Fan, and Daniel Mosse</i>	

StoryLine: Unsupervised Geo-event Demultiplexing in Social Spaces without Location Information.....	83
<i>Shiguang Wang, Prasanna Giridhar, Hongwei Wang, Lance Kaplan, Tien Pham, Aylin Yener, and Tarek Abdelzaher</i>	

Wireless Everywhere

DaRe: Data Recovery through Application Layer Coding for LoRaWAN	97
<i>Paul J. Marcelis, Vijay S. Rao, and R. Venkatesha Prasad</i>	
Adaptive Software-Defined Visible Light Communication Networks.....	109
<i>Stefan Schmid, Benjamin von Deschwenden, Stefan Mangold, and Thomas R. Gross</i>	
ImageBeacon: Broadcasting Color Images over Connectionless Bluetooth LE Packets.....	121
<i>Chong Shao and Shahriar Nirjon</i>	
ATHOME: Automatic Tunable Wireless Charging for Smart Home	133
<i>Zheng Dong, Yu Gu, Lingkun Fu, Jiming Chen, Tian He, and Cong Liu</i>	

Securing IoT (Joint Session with IPSN)

Kryptein: A Compressive-Sensing-Based Encryption Scheme for the Internet of Things (IPSN)	
<i>Wanli Xue, Chenwen Luo, Guohao Lan, Rajib Rana, Wen Hu, and Aruna Seneviratne</i>	
PitchIn: Eavesdropping via Intelligible Speech Reconstruction Using Non-acoustic Sensor Fusion (IPSN)	
<i>Jun Han, Albert Jin Chung, and Patrick Tague</i>	
A Toolkit for Construction of Authorization Service Infrastructure for the Internet of Things.....	147
<i>Hokeun Kim, Eunsuk Kang, Edward A. Lee, and David Broman</i>	
An IoT Data Communication Framework for Authenticity and Integrity	159
<i>Xin Li, Huazhe Wang, Ye Yu, and Chen Qian</i>	

Short Papers

Towards an Optimized BlockChain for IoT.....	173
<i>Ali Dorri, Salil S. Kanhere, and Raja Jurdak</i>	
Designing a Micro-moving Target IPv6 Defense for the Internet of Things.....	179
<i>Kimberly Zeitz, Michael Cantrell, Randy Marchany, and Joseph Tront</i>	
A Game of Things: Strategic Allocation of Security Resources for IoT	185
<i>Daniele Midi, Edoardo Serra, and Elisa Bertino</i>	
Learning Execution Contexts from System Call Distribution for Anomaly Detection in Smart Embedded System.....	191
<i>Man-Ki Yoon, Sibin Mohan, Jaesik Choi, Mihai Christodorescu, and Lui Sha</i>	

On the Use of Radio Frequency Identification for Continuous Biomedical Monitoring.....	197
<i>William M. Mongan, Ilhaan Rasheed, Khyati Ved, Shrenik Vora, Kapil Dandekar, Genevieve Dion, Timothy Kurzweg, and Adam Fontecchio</i>	
Quick and Autonomous Platoon Maintenance in Vehicle Dynamics for Distributed Vehicle Platoon Networks.....	203
<i>Ankur Sarker, Chenxi Qiu, and Haiying Shen</i>	
MobiT: A Distributed and Congestion-Resilient Trajectory Based Routing Algorithm for Vehicular Delay Tolerant Networks.....	209
<i>Li Yan, Haiying Shen, and Kang Chen</i>	
EcoLoc: Toward Universal Location Sensing by Encounter-Based Collaborative Indoor Localization.....	215
<i>Hsinchung Chen, Yi Lin Chen, Chia Hsun Wu, Mohammad Abdullah Al Faruque, and Pai H. Chou</i>	

IoT Systems: From Devices to Cloud

SafeWatch: A Wearable Hand Motion Tracking System for Improving Driving Safety.....	223
<i>Chongguang Bi, Jun Huang, Guoliang Xing, Landu Jiang, Xue Liu, and Minghua Chen</i>	
Enabling Micro-level Demand-Side Grid Flexibility in Resource Constrained Environments.....	233
<i>Diego Ponce de Leon Barido, Stephen Suffian, Javier Rosa, Eric Brewer, and Daniel M. Kammen</i>	
Where's the Bear? Automating Wildlife Image Processing Using IoT and Edge Cloud Systems.....	247
<i>Andy Rosales Elias, Nevena Golubovic, Chandra Krintz, and Rich Wolski</i>	
CityGuard: A Watchdog for Safety-Aware Conflict Detection in Smart Cities.....	259
<i>Meiyi Ma, Sarah Masud Preum, and John A. Stankovic</i>	

Demo Abstracts

Demo Abstract: Adaptive Software-Defined Visible Light Communication Networks.....	273
<i>Stefan Schmid, Stefan Mangold, and Thomas R. Gross</i>	
Demo Abstract: Simulating Conflict Detection in Heterogeneous Services of a Smart City.....	275
<i>Meiyi Ma, Sarah Masud Preum, John A. Stankovic</i>	
Demo Abstract: Motion-Triggered Surveillance Camera Using MF-IoT.....	277
<i>Jiachen Chen, Sugang Li, Yanyong Zhang, and Dipankar Raychaudhuri</i>	
Demo Abstract: On-Demand Information Retrieval from Videos Using Deep Learning in Wireless Networks.....	279
<i>Zongqing Lu, Noor Felemban, Kevin Chan, and Thomas La Porta</i>	

Demo Abstract: Fog Computing for Improving User Application Interaction and Context Awareness.....	281
<i>Enrique Saurez, Harshit Gupta, Ruben Mayer, and Umakishore Ramachandran</i>	
Demo Abstract: Image Storage and Broadcast via Bluetooth Low Energy Beacons.....	283
<i>Chong Shao and Shahriar Nirjon</i>	
Demo Abstract: Event Tracker Using Social Networks.....	285
<i>Prasanna Giridhar, Shiguang Wang, and Tarek Abdelzaher</i>	
Demo Abstract: Enhanced Real-Time Machine Inspection with MobileAugmented Reality for Maintenance and Repair.....	287
<i>Indika Wijesooriya, Damith Wijewardana, Tharindu De Silva, and Chandana Gamage</i>	
Demo Abstract: A Semantic Notification Approach for IoT-Based Sensory Data.....	289
<i>Majed Alowaidi, Md. Abdur Rahman, Elham Hassanain, and Abdulmotaleb El Saddik</i>	
Demo Abstract: PlanIt and DQ-N for Low-Power Wide-Area Networks.....	291
<i>Keyi Zhang and Alan Marchiori</i>	
Demo Abstract: Smart Piggy Bank: In-Home Banking System for Children.....	293
<i>Yong-Jae Lee, Koan Seok Kim, and Ho-Joon Lee</i>	
Demo Abstract: RIO-40C – A Low-Cost Wearable Sunlight Exposure Monitor for Skincare.....	295
<i>Daniel de Godoy, Ji Jia, and Xiaofan Jiang</i>	
Demo Abstract: Visual Analytics of Higher-Order Dependencies in Sensor Data.....	297
<i>Jian Xu, Jun Tao, Nitesh Chawla, and Chaoli Wang</i>	
Demo Abstract: Abating LPL-Induced Latency with Wake-Up Radio Technology.....	299
<i>Stefano Basagni, Federico Ceccarelli, Fabrizio Gattuso, and Chiara Petrioli</i>	
Demo Abstract: Cyber-Physical Fingerprinting for Internet of Things Authentication.....	301
<i>Yaman Sharaf-Dabbagh, and Walid Saad</i>	

Poster Abstracts

Poster Abstract: Obstacle and Connectivity Aware Wireless Video Sensor Deployment for 3D Indoor Monitoring.....	305
<i>T. Brown, Z. Wang, T. Shan, F. Wang, and J. Xue</i>	
Poster Abstract: Design of Intelligent Software Systems for Cyber-Physical Systems.....	307
<i>(Bob) Weihai He</i>	
Poster Abstract: Toothbrushing Recognition Using Neural Networks.....	309
<i>Hua Huang and Shan Lin</i>	
Poster Abstract: Recommendation-Based Smart Indoor Navigation.....	311
<i>Wenlu Wang and Wei-Shinn Ku</i>	

Poster Abstract: Ad-hoc Affectance-Selective Families for Layer Dissemination in IoT Subnets	313
<i>Dariusz R. Kowalski, Harshita Kudaravalli, and Miguel A. Mosteiro</i>	
Poster Abstract: Context Intelligence in Pervasive Environments	315
<i>Jonathan Francis, Alessandro Oltramari, Sirajum Munir, Charles Shelton, and Anthony Rowe</i>	
Poster Abstract: Data-centric IoT Services Provisioning in Fog-Cloud Computing Systems	317
<i>Amir Taherkordi and Frank Eliassen</i>	
Poster Abstract: Predictable Wireless Networking for Real-Time Cyber-Physical-Human Systems	319
<i>Hongwei Zhang, Chuan Li, Yu Chen, Pengfei Ren, and Ling Wang</i>	
Poster Abstract: Human Mobility Modeling on Metropolitan Scale Based on Multiple Cellphone Networks.....	321
<i>Zhihan Fang and Desheng Zhang</i>	
Poster Abstract: An Open Smart City IoT Test Bed.....	323
<i>Bharadwaj Amrutur, Vasanth Rajaraman, Srikrishna Acharya, Rakshit Ramesh, Ashish Joglekar, Abhay Sharma, Abhijit Lele, Ashwin Mahesh, and Sathya Sankaran</i>	
Poster Abstract: Trust Evaluation for Data Exchange in Vehicular Networks.....	325
<i>Nguyen Binh Truong and Gyu Myoung Lee</i>	
Poster Abstract: OPC-UA Communication Framework for PLC-Based Industrial IoT Applications	327
<i>Woonggy Kim and Minyoung Sung</i>	
Poster Abstract: Extending App Pre-launch Service with Emotion Context	329
<i>Jinyoung Choi, Jemin Lee, and Hyungshin Kim</i>	
Poster Abstract: Enabling IoT Applications via Dynamic Cloud-Edge Resource Management	331
<i>Shashank Shekhar and Aniruddha Gokhale</i>	
Poster Abstract: Flexible, Fine Grained Access Control for Internet of Things.....	333
<i>Qian Zhou, Mohammed Elbadry, Fan Ye, and Yuanyuan Yang</i>	
Poster Abstract: Fine-Grained Location-Based Sensor Mapping.....	335
<i>Joseph Szurley, Charles Shelton, Patrick Lazik, and Anthony Rowe</i>	
Poster Abstract: EcoLoc: Encounter-Based Collaborative Indoor Localization	337
<i>Hsinchung Chen, Yi Lin Chen, Chia Hsun Wu, Mohammad Abdullah Al Faruque, and Pai H. Chou</i>	

Poster Abstract: Detecting Abnormalities in IoT Program Executions through Control-Flow-Based Features	339
<i>Akash Agarwal, Samuel Dawson, Derrick McKee, Patrick Eugster, Matthew Tancreti, and Vinaitheerthan Sundaram</i>	
Poster Abstract: Wireless Control for the IoT: Power, Spectrum, and Security Challenges.....	341
<i>Konstantinos Gatsis and George J. Pappas</i>	
Poster Abstract: Maximizing Accuracy of Fall Detection and Alert Systems Based on 3D Convolutional Neural Network.....	343
<i>Seokhyun Hwang, DaeHan Ahn, Homin Park, and Taejoon Park</i>	
Poster Abstract: Quality of Experience Aware Collaborative Augment Reality System (Q-CARs).....	345
<i>Liu Cui, Si Chen, and Zhen Jiang</i>	
Poster Abstract: Creating an Abstraction to Exploit IoT Synergies	347
<i>Zach Leidall, Abhishek Chandra, and Jon Weissman</i>	
Poster Abstract: Optimizing Tours for Mobile Chargers with Roadside Segment Coverage	349
<i>Xunpeng Rao, Panlong Yang, and Yubo Yan</i>	
Poster Abstract: Security in Uplink MU-MIMO Networks	351
<i>Fei Wang, Wei Xi, Jinsong Han, Kun Zhao, and Yuan Gao</i>	
Poster Abstract: Water in the Cloud: Remote Understanding of Water Chemistry	353
<i>Roger Chamberlain, Mike Chambers, Darren Greenwalt, Brett Steinbrueck, and Todd Steinbrueck</i>	
Poster Abstract: Frugal Crowd Sensing for Bus Arrival Time Prediction in Developing Regions	355
<i>Gabriel B. Kalejaiye, Henrique R. Orefice, Teogenes A. Moura, Matheus Bafutto, and Marcelo M. Carvalho</i>	
Author Index.....	357