

2017 Tenth International Conference on Mobile Computing and Ubiquitous Network (ICMU 2017)

**Toyama, Japan
3-5 October 2017**



**IEEE Catalog Number: CFP17YAT-POD
ISBN: 978-1-5386-0594-3**

**Copyright © 2018, Information Processing Society of Japan (IPSJ)
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:	CFP17YAT-POD
ISBN (Print-On-Demand):	978-1-5386-0594-3
ISBN (Online):	978-4-907626-31-0

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 Tenth International Conference on Mobile Computing and Ubiquitous Network (ICMU)

Sensing

Approaching Vehicle Detection Method with Acoustic Analysis using Smartphone for Elderly Bicycle Driver

Shogo Kawanaka (Nara Institute of Science and Technology, Japan), Yukitoshi Kashimoto (Nara Institute of Science and Technology, Japan), Aryan Firouzian (University of Oulu, Finland), Yutaka Arakawa (Nara Institute of Science and Technology & NAIST, Japan), Keiichi Yasumoto (Nara Institute of Science and Technology, Japan), Petri Pulli (University of Oulu, Finland) 1

Implementation and Evaluation of Child's Location History Transportation Device for Potentially Dangerous Area Detection

Kazunori Omura (Aichi Institute of Technology, Japan), Hiroyuki Nonomura (Aichi Institute of Technology, Japan), Katsuhiro Naito (Aichi Institute of Technology, Japan), Tadanori Mizuno (Aichi Institute of Technology, Japan), Katsuhiko Kaji (Aichi Institute of Technology, Japan) 7

Evaluating the Spatio-temporal Coverage of Automotive Sensing for Smart Cities

Yin Chen (Keio University, Japan), Takuro Yonezawa (Keio University, Japan), Jin Nakazawa (Keio University, Japan), Hideyuki Tokuda (Keio University, Japan) 13

Urban Dust Monitoring From Ground Level to Last Floor

Renato Ferrero (Politecnico di Torino, Italy), Filippo Gandino (Politecnico di Torino, Italy), Masoud Hemmatpour (Politecnico di Torino, Italy), Bartolomeo Montruccio (Politecnico di Torino, Italy), Maurizio Rebaudengo (Politecnico di Torino, Italy) 18

Discussions on Congestion Control with Network Coding for Switches in Campus Networks

Satoru Ono (Shizuoka University, Japan), Masaki Bandai (Sophia University, Japan), Takashi Watanabe (Osaka University, Japan) 22

Location

Accuracy Improvement in Sensor Localization System utilizing Heterogeneous Wireless Technologies

Takahiro Yamamoto (Kyushu University, Japan), Shigemi Ishida (Kyushu University, Japan), Kousaku Izumi (Kyushu University, Japan), Shigeaki Tagashira (Kansai University, Japan), Akira Fukuda (Kyushu University, Japan) 26

Analysis of Random Geometric Graph for Wireless Network Configuration

Renato Ferrero (Politecnico di Torino, Italy), Filippo Gandino (Politecnico di Torino, Italy) 32

A Three-Dimensional Smartphone Positioning Method using a Spinning Magnet Marker

Kosuke Watanabe (Nagoya University, Japan), Kei Hiroi (Nagoya University, Japan), Takeshi Kamiyama (NTT DOCOMO, Inc., Japan), Sano Hiroyuki (NTT DOCOMO, Inc., Japan), Masakatsu Tsukamoto (NTT DOCOMO, Inc., Japan), Masaji Katagiri (NTT DOCOMO, INC., Japan), Daizo Ikeda (NTT DOCOMO, INC., Urban Sensing Research Group, Research Laboratories, Japan), Katsuhiko Kaji (Aichi Institute of Technology, Japan), Nobuo Kawaguchi (Nagoya University, Japan) 38

The Optimal Meeting Point Based on Trip Plans in Spatial Databases

Mohammad Ahmadi (University of Allameh Dehkhoda, Iran), Vahid Haghigatdoost (Shahed University, Iran) 45

A Notification Environment Using User-Installed Beacons

Shuhei Hashimoto (Ritsumeikan University & Graduate School of Information Science and Engineering, Japan), Syuhei Yamamoto (Ritsumeikan University, Japan), Ryo Nishide (Kobe University, Japan), Hideyuki Takada (Ritsumeikan University, Japan) 49

Poster and Demo

<i>CICS/PUI: Color-lighting and Illuminance Control System using Paper UI</i>	
Tomoki Okuro (Doshisha University, Japan), Hiroto Aida (Doshisha University, Japan), Daisuke Yamashita (Doshisha University, Japan), Shuhei Morimura (Doshisha University, Japan), Mitunori Miki (Doshisha University, Japan)	53
<i>Recording Daily Life Food Intake Using Intra-body Communication Technology</i>	
Yuichi Mitsudo (Institute of Systems, Information Technologies and Nanotechnologies, Japan)	55
<i>An automatic training system against Advanced Persistent Threat</i>	
Kazuki Iwata (Graduate School of Future University Hakodate, Japan), Yoshitaka Nakamura (Future University Hakodate, Japan), Hiroshi Inamura (Future University Hakodate, Japan), Osamu Takahashi (Future University Hakodate, Japan)	57
<i>An indoor location estimation using BLE beacons considering movable obstructions</i>	
Hisashi Hoshi (KDDI Research, Inc., Japan), Hiroki Ishizuka (KDDI Labs, Japan), Arei Kobayashi (KDDI R&D Laboratories Inc., Japan), Atsunori Minamikawa (KDDI R&D Laboratories, Inc., Japan)	59
<i>Detection of Half-turn Stairs from Walking Trajectories Estimated by Pedestrian Dead Reckoning</i>	
Kosuke Yotsuya (Aichi Institute of Technology, Japan), Haruka Iwase (Aichi Institute of Technology, Japan), Nobuyuki Ito (Mitsubishi Electronic Engineering Co. Ltd., Japan), Katsuhiro Naito (Aichi Institute of Technology, Japan), Naoya Chujo (Aichi Institute of Technology, Japan), Tadanori Mizuno (Aichi Institute of Technology, Japan), Katsuhiko Kaji (Aichi Institute of Technology, Japan)	61
<i>Cloud-based UAV Data Delivery over 4G Network</i>	
Yujie Zhang (Hangzhou Dianzi University, P.R. China), Zhenhui Yuan (Hangzhou Dianzi University, P.R. China)	63
<i>A Japanese Input Method Using Leap Motion in Virtual Reality</i>	
Kosuke Komiya (Waseda University, Japan), Tatsuo Nakajima (Waseda University, Japan)	65
<i>Development of an End-to-End Communication Adapter and Implementation</i>	
Fumiya Ogyu (Meijo University, Japan), Hidekazu Suzuki (Meijo University, Japan), Katsuhiro Naito (Aichi Institute of Technology, Japan), Akira Watanabe (Meijo University, Japan)	67
<i>Realization and Evaluation of Java Wrapper That Calls the End-to-End Communication Library</i>	
Kazuki Shimizu (Meijo University, Japan), Hidekazu Suzuki (Meijo University, Japan), Katsuhiro Naito (Aichi Institute of Technology, Japan), Akira Watanabe (Meijo University, Japan)	69
<i>Recognizing Whether a Person is Eating Alone or Has Company by Using Wearable Devices</i>	
Kazuki Kiri (University of Tokyo, Japan), Keiichi Ochiai (NTT DOCOMO, Japan), Akiya Inagaki (NTT DOCOMO, Japan), Naoki Yamamoto (NTT DOCOMO, Japan), Yusuke Fukazawa (NTT DOCOMO, Inc., Japan), Masatoshi Kimoto (NTT DOCOMO, Japan), Tsukasa Okimura (Keio University, Japan), Yuri Terasawa (Keio University, Japan), Takaki Maeda (Keio University, Japan), Jun Ota (The University of Tokyo, Japan)	71
<i>The Effectiveness of Virtual Learning Environment for Higher Education Learners in ASEAN Community</i>	
Nutthakorn Songkram (King Mongkut's Institute of Technology Ladkrabang, Thailand), Noawanit Songkram (Chulalongkorn University, Thailand)	73
<i>Children's Observation System Using Information Terminal Bus Stop</i>	
Taku Kurabayashi (Kanazawa Institute of Technology, Japan), Ryotaro Hirazakura (KIT, Japan), Mikiko Sode Tanaka (Kanazawa technical collage, Japan), Yosuke Miyanishi Miyanishi (KIT, Japan), Shoki Tomizawa (Kanazawa Institute of Technology, Japan), Masashi Saito (Kanazawa Institute of Technology, Japan)	75
<i>Play Recognition Using Spatio-Temporal Relationship of Football Tracking Data</i>	
Tomoki Imai (Graduate School of Information Science and Technology, Osaka University, Japan), Akira Uchiyama (Graduate School of Information Science and Technology, Osaka University, Japan), Takuya Magome (Graduate School of Medicine, Osaka University, Japan), Teruo Higashino (Graduate School of Information Science and Technology, Osaka University, Japan)	77

Security

Post-Quantum Authentication in OpenSSL with Hash-Based Signatures

Denis Butin (TU Darmstadt, Germany, Germany), Julian Wälde (TU Darmstadt, Germany,
Germany), Johannes Buchmann (TU Darmstadt, Germany, Germany)

81

Mixed Public and Secret-key Cryptography for Wireless Sensor Networks

Mattia Griotti (Politecnico di Torino, Italy), Filippo Gandino (Politecnico di Torino, Italy),
Maurizio Rebaudengo (Politecnico di Torino, Italy)

87

Privacy-preserving and Fine-grained Data Aggregation Framework for Crowdsourcing

Gaoqiang Zhuo (Binghamton University, USA)

93

Considering Interpersonal Differences in Validating Wearable Sleep-Tracking Technologies

Zilu Liang (The University of Tokyo & National Institute of Advanced Industrial Science and
Technology, Japan), Mario Alberto Chapa Martell (CAC Corporation, Japan)

99

*An Alternative Approach to Blockchain Mining Work for Making Blockchain Technologies Fit to
Ubiquitous and Mobile Computing Environments*

Yuki Kano (Waseda University, Japan), Tatsuo Nakajima (Waseda University, Japan)

103

Communication

*Design and Implementation of a Wireless Network Tap Device for IEEE 802.11 Wireless
Network Emulation*

Arata Kato (Shizuoka University, Japan), Mineo Takai (University of California, Los Angeles &
Osaka University, USA), Susumu Ishihara (Shizuoka University, Japan)

107

Reliable Wireless Communications in Battery Management System of Electric Vehicles

Tadahide Kunitachi (Osaka University & YAZAKI Corporation, Japan), Kazuhiko Kinoshita
(Tokushima University, Japan), Takashi Watanabe (Osaka University, Japan)

113

IP Mobility Enhancements for MIIPv6 and PMIPv6

Rui Meng (Huawei, P.R. China), Bin Da (Beijing Huawei Digital Technologies Co., Ltd., P.R.
China), Chuang Wang (Huawei Corporation, P.R. China)

119

ACRA: Adaptive Clustering Resource Allocation for Vehicle to Vehicle Communications

Cheng-Yu Chen (National Dong Hwa University, Taiwan), Cheng-Sen Huang (National Dong
Hwa University, Taiwan), Jen-Yeu Chen (National Dong Hwa University, Taiwan)

125

*Maximum Weight Packet Scheduling Scheme with Retransmission in Multi-hop Wireless
Networks*

Jipeng Zhou (Jinan University, P.R. China), Xiaofeng Chen (Jinan University, P.R. China),
Yuhui Deng (Jinan University, P.R. China), Lin Cui (Jinan University, P.R. China), Kaimin Wei
(Jinan University, P.R. China), Gang Zhong (Jinan University, Japan)

130

Recognition

Utilizing Mobile Devices for Evaluating Body Trunk Coordination: Feasibility and Preliminary Results

- Zilu Liang (The University of Tokyo & National Institute of Advanced Industrial Science and Technology, Japan), Takuichi Nishimura (National Institute of Advanced Industrial Science and Technology, Japan), Nami Iino (National Institute of Advanced Industrial Science and Technology, Japan), Satoshi Nishimura (National Institute of Advanced Industrial Science and Technology, Japan), Yasuyuki Yoshida (National Institute of Advanced Industrial Science and Technology, Japan) 134

Improving Recognition Accuracy for Activities of Daily Living by Adding Time and Area Related Features

- Teruhiro Mizumoto (Nara Institute of Science and Technology, Japan), Krita Pattamasiriwat (Kasetsart University, Thailand), Yutaka Arakawa (Nara Institute of Science and Technology & NAIST, Japan), Keiichi Yasumoto (Nara Institute of Science and Technology, Japan) 140

Pedestrian Direction Estimation for Each Step Using Plane Component of Accelerometer

- Shogo Shimizu (Aichi Institute of Technology, Japan), Nobuyuki Ito (Mitsubishi Electronic Engineering Co. Ltd., Japan), Katsuhiro Naito (Aichi Institute of Technology, Japan), Naoya Chujo (Aichi Institute of Technology, Japan), Tadanori Mizuno (Aichi Institute of Technology, Japan), Katsuhiko Kaji (Aichi Institute of Technology, Japan) 146

Social

Evaluating Effects of Information Sharing Interface Utilizing Utterance on Co-located Collaborative Search

- Takatsugu Yamamoto (Ritsumeikan University, Japan), Takehiro Koretsune (Ritsumeikan University, Japan), Jo Imamoto (Ritsumeikan University, Japan), Hideyuki Takada (Ritsumeikan University, Japan) 152

Estimating Customer Preference through Store Check-in Histories and its Use in Visitor Promotion

- Chiaki Doi (NTT DOCOMO, INC., Japan), Masaji Katagiri (NTT DOCOMO, INC., Japan), Akira Ishii (NTT DOCOMO, INC., Japan), Teppei Konishi (NTT DOCOMO, Inc., Japan), Takashi Araki (NTT DOCOMO, INC., Japan), Ken Ohta (NTT DOCOMO, INC., Japan), Hiroshi Inamura (Future University Hakodate, Japan), Hiroshi Shigeno (Keio University, Japan) 158

A Broadcast Distribution System for Deliver Emergency Bulletins to User Equipments of Outside eNBs Coverage

- Yutaka Musaka (Future University Hakodate, Japan), Yoshitaka Nakamura (Future University Hakodate, Japan), Hiroshi Inamura (Future University Hakodate, Japan) 164

Virtual Smart Classroom to Enhance 21 st Century Skills in Learning and Innovation for Higher Education Learners

- Noawanit Songkram (Chulalongkorn University, Thailand) 170

A Mobile Based Emergency Reporting Application for the Philippine National Police Emergency Hotline 911: A Case for the Development of i911

- Shallom Edillo (National University, Philippines), Pamela Judith Garrote (National University, Philippines), Lucky Celyn Domingo (National University, Philippines), Arianne Malapit (National University, Philippines), Bernie S Fabito (National University, Philippines) 174

Application

<i>DeepRemote: A Smart Remote Controller for Intuitive Control through Home Appliances Recognition by Deep Learning</i>	
Yuta Takahashi (Nara Institute of Science and Technology, Japan), Naoki Shirakura (Nara Institute of Science and Technology, Japan), Kenta Toyoshima (Nara Institute of Science and Technology, Japan), Takuro Amako (Nara Institute of Science and Technology, Japan), Ryota Isobe (Nara Institute of Science and Technology, Japan), Jun Takamatsu (Nara Institute of Science and Technology, Japan), Keiichi Yasumoto (Nara Institute of Science and Technology, Japan)	178
<i>Clash Tanks: An Investigation of Virtual and Augmented Reality Gaming Experience</i>	
Shubhankar Ranade (Waseda University, Japan), Mingshu Zhang (Waseda University, Japan), Mohammed Al-sada (Waseda University, Japan), Jaryd Urbani (Waseda University, Japan), Tatsuo Nakajima (Waseda University, Japan)	184
<i>Compression Method for ECU Software Updates</i>	
Yutaka Onuma (Graduate School of Kanagawa Institute of Technology, Japan), Sumika Nakamura (Kanagawa Institute of Technology, Japan), Yoshiaki Terashima (Soka University, Japan), Ryozo Kiyohara (Kanagawa Institute of Technology, Japan)	190