2019 Twelfth International Conference on Mobile Computing and Ubiquitous Network (ICMU 2019)

Kathmandu, Nepal 4 – 6 November 2019



IEEE Catalog Number: CFP19YAT-POD ISBN: 978-1-7281-4226-5

Copyright © 2019, Information Processing Society of Japan 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:
 CFP19YAT-POD

 ISBN (Print-On-Demand):
 978-1-7281-4226-5

 ISBN (Online):
 978-4-907626-41-9

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



Monday, November 4, 2019

Monday, November 4 10:30 – 12:20

Session 1: Location

Chair: Katsuhiko Kaji (Aichi Institute of Technology, Japan)

An End-to-End BLE Indoor Location Estimation Method using LSTM 1

Kenta Urano, Kei Hiroi, Takuro Yonezawa, Nobuo Kawaguchi (Graduate School of Engineering, Nagoya University, Japan)

PBEM: A Pattern-Based Embedding Model for User Location Category Prediction 8

Yingying Duan, Wei Lu, Weiwei Xing, Peng Bao, Xiang Wei (School of Software Engineering, Beijing Jiaotong University, China)

Improving Accuracy of Localization with Portable APs in Ultra-Narrow-Band-based LPWA Networks 14

Miya Fukumoto (Graduate School of Systems Engineering, Wakayama University, Japan), Takuya Yoshihiro (Wakayama University, Japan)

Anup Kumar Paul, Mohammad Arifuzzaman (East West University, Bangladesh), Keping Yu, Takuro Sato (Waseda University, Japan)

Building a Reliable and Cost-Effective RTK-GNSS Infrastructure for Precise Positioning of IoT Applications 24

Bhagawan Rokaha (Graduate School of Integrated Science and Technology, Shizuoka University, Japan), Bishnu Prasad Gautam (Wakkanai Hokusei Gakuen University Wakkanai, Japan), Tomoya Kitani (Shizuoka University)

Monday, November 4 13:20 - 14:50

Session 2: Wireless Network 1

Chair: Surendra Shrestha (Tribhuvan University, Nepal)

Routing Protocol Using Virtual Nodes for Traffic Information Collection in Information Centric Vehicular Adhoc Networks 28

Toshiya Miyazaki, Hiroshi Shigeno (Graduate School of Science and Technology, Keio University, Japan), Tomoyuki Yashiro (Chiba Institute of Technology Chiba, Japan)

A Traffic-Demand-Aware Collision-free Channel Allocation for Multi-channel Wireless Mesh Networks ... 34

Yi Tian (Graduate School of Systems Engineering, Wakayama University, Japan), Takuya Yoshihiro (Wakayama University, Japan)

Layer 2 Packet Authentication for IoT Sensor Networks 40

Shoichiro Seno (Tokushima Bunri University, Japan)

Network Behavior Estimation Method for Wireless Ad-Hoc Networks by Analyzing Data Transmission Traffic 46

Koichi Fukuoka, Miyuki Yamamoto (Graduate School of Engineering, Soka University, Japan), Tetsuya Yokotani, Masashi Saito (Kanazawa Institute of Technology, Japan), Yoshiaki Terashima (Soka University, Japan)

Monday, November 4 17:10 – 18:40

Poster/Demo Session

A PDR Smartphone Application Considering Side/Backward Steps 50

Katsuhiko Kaji, Masaaki Kaneko (Aichi Institute of Technology, Japan), Nobuyuki Ito (Mitsubishi Electric Engineering Company Limited, Japan), Katsuhiro Naito, Naoya Chujo, Tadanori Mizuno (Aichi Institute of Technology, Japan)

Shopping Refugees Support Robot with SNS Agency Function 52

Toru Kobayashi, Takahiro Honda, Kenichi Arai, Tetsuo Imai (Graduate School of Engineering, Nagasaki University, Japan)

Edge AI and Blockchain for Privacy-Critical and Data-Sensitive Applications 54

Anum Nawaz (Fudan University, China; University of Turku, Finland), Tuan Nguyen Gia, Jorge Pena Queralta, Tomi Westerlund (University of Turku, Finland)

Li Qingqing (Fudan University, China; University of Turku, Finland), Jorge Pena Queralta, Tuan Nguyen Gia (University of Turku, Finland), Hannu Tenhunen (KTH Royal Institute of Technology, Sweden), Zhuo Zou (Fudan University, China), Tomi Westerlund (University of Turku, Finland)

Tuan Nguyen Gia, Li Qingqing, Jorge Pena Queralta (University of Turku, Finland), Zhuo Zou (Fudan University, China), Hannu Tenhunen, Tomi Westerlund (University of Turku, Finland)

Edge Computing for Mobile Robots: Multi-Robot Feature-Based Lidar Odometry with FPGAs 60

Li Qingqing, Yuhong Fu (Fudan University, China), Jorge Pena Queralta, Tuan Nguyen Gia (University of Turku, Finland), Hannu Tenhunen (KTH Royal Institute of Technology, Sweden), Zhuo Zou (Fudan University, China), Tomi Westerlund (University of Turku, Finland)

Preliminary Investigation of Visualizing Human Activity Recognition Neural Network 62

Naoya Yoshimura, Takuya Maekawa, Takahiro Hara (Osaka University, Japan)

Channel Reservation by Even-odd Separation in Multiple Subcarrier Multiple Access 64

Kouki takahashi, Yuki Takazawa (Kanagawa Institute of Technology, Japan), Hiromu Kamei, Jin Mitsugi (Keio University, Japan), Haruhisa Ichikawa (The University of Electro-Communications, Japan), Yuusuke Kawakita (Kanagawa Institute of Technology, Japan)

Reducing Waiting Time at an Intersection with Autnomous and non-Autonomous Vehicles 66

Atsushi Segawa, Ryozo kiyohara (Kanagawa Institute of Technology, Japan)

November 5, 2019

Tuesday, November 5 9:30 - 10:30

Session 3: Healthcare

Chair: Akira Uchiyama (Osaka University, Japan)

Haruhisa Maeda, Sachio Saiki, Masahide Nakamura (Graduate School of System Informatics, Kobe University, Japan), Kiyoshi Yasuda (Osaka Institute of Technology, Japan)

Prediction of Post-induction Hypotension Using Stacking Method 74

Koki Iwai, Chiaki Doi, Nanaka Asai (Graduate School of Science and Technology, Keio University, Japan), Satoshi Ideno (Keio University School of Medicine, Japan), Hiroyuki Seki (Tokyo Dental College Ichikawa General Hospital, Japan), Jungo Kato, Takashige Yamada, Hiroshi Morisaki (Keio University School of Medicine, Japan), Hiroshi Shigeno (Graduate School of Science and Technology, Keio University, Japan)

Nanaka Asai, Chiaki Doi, Koki Iwai (Graduate School of Science and Technology, Keio University, Japan), Satoshi Ideno (Keio University School of Medicine, Japan), Hiroyuki Seki (Tokyo Dental College Ichikawa General Hospital, Japan), Jungo Kato, Takashige Yamada, Hiroshi Morisaki (Keio University School of Medicine, Japan), Hiroshi Shigeno (Graduate School of Science and Technology, Keio University, Japan)

Tuesday, November 5 13:00 - 14:20

Session 4: Wirelessss Network 2

Chair: Bishnu Prasad Gautam (Wakkanai Hokusei Gakuen University, Japan)

Low-Power WSN System for Honey Bee Monitoring 82

Tymoteusz Cejrowski, Julian Szymanski, Andrzej Sobecki (Gdańsk University of Technology, Poland), David Gil, Higinio Mora (University of Alicante, Spain)

Throughput Modeling and Analysis under Power Control in High Efficiency Wireless LAN 88

Koki Iwai, Takanobu Ohnuma, Riku Inada, Hiroshi Shigeno (Graduate School of Science and Technology, Keio University, Japan)

Number of TCP Connections to Saturate Bandwidth of Wireless Networks 94

Junichi Funasaka, Hiroyasu Obata, Kenji Ishida (Graduate School of Computer Sciences, Hiroshima City University, Japan)

Wednesday, November 6, 2019

Wednesday, November 6 9:30 - 11:10

Session 5: Mobile Application 1

Chair: Subarna Shakya (Tribhuvan University, Nepal)

Cloud-based Dynamic Tiled Display Adapting to Grouping by Distinction of Mobile Devices 100

Tohru Kondo (Information Media Center, Hiroshima University, Japan), Kaori Maeda (Graduate School of Information Sciences Hiroshima City University, Japan)

MapReduce Processing with 5G Networks 106

Ichiro Satoh (National Institute of Informatics, Japan)

Yasunori Owada, Goshi Sato, Katsuhiro Temma, Toshiaki Kuri, Masugi Inoue, Takeshi Nagano (National Institute of Information and Communications Technology, Japan)

Ryosuke Hasegawa, Akira Uchiyama, Teruo Higashino (Graduate School of Information Science and Technology, Osaka University, Japan)

Wednesday, November 6 11:30 - 12:20

Session 6: Mobile Application 2

Chair: Chiaki Doi (NTT DOCOMO, Inc., Japan)

Data Correction Management Method Using Temporal Data in Fog Computing 124

Tsukasa Kudo (Shizuoka Institute of Science and Technology, Japan)

Miyuki Yamamoto, Koichi Fukuoka (Soka University, Japan), Ryozo Kiyohara (Kanagawa Institute of

Technology, Japan), Yoshiaki Terashima (Soka University, Japan)

A Smartphone Application that Automatically Provides Arrival Time based on Estimation of Train on Board 132

Haruki Inoue (Graduate School of Business Administration and Computer Science, Aichi Institute of Technology, Japan), Katsuhiko Kaji (Aichi Institute of Technology, Japan)

Wednesday, November 6 13:20 - 15:00

Session 7: Mobile Application 3

Chair: Takuya Yoshihiro (Wakayama University, Japan)

#