



This is an electronic reprint of the original article. This reprint may differ from the original in pagination and typographic detail.

Hara, Takahiro; Sigg, Stephan; Shu, Lei; De Pellegrini, Francesco; Petrioli, Chiara; Madria, Sanjay Kumar IEEE Access Special Section Editorial

Published in: IEEE Access

DOI: 10.1109/ACCESS.2017.2783100

Published: 01/01/2017

Document Version Publisher's PDF, also known as Version of record

Please cite the original version:

Hara, T., Sigg, S., Shu, L., De Pellegrini, F., Petrioli, C., & Madria, S. K. (2017). IEEE Access Special Section Editorial: Emergent Topics for Mobile and Ubiquitous Systems in Smartphone, IOT, and Cloud Computing ERA. *IEEE Access*, *5*, 27827-27830. Article 8262683. https://doi.org/10.1109/ACCESS.2017.2783100

This material is protected by copyright and other intellectual property rights, and duplication or sale of all or part of any of the repository collections is not permitted, except that material may be duplicated by you for your research use or educational purposes in electronic or print form. You must obtain permission for any other use. Electronic or print copies may not be offered, whether for sale or otherwise to anyone who is not an authorised user.



Date of current version January 18, 2018. Digital Object Identifier 10.1109/ACCESS.2017.2783100

EDITORIAL IEEE ACCESS SPECIAL SECTION EDITORIAL: EMERGENT TOPICS FOR MOBILE AND UBIQUITOUS SYSTEMS IN SMARTPHONE, IOT, AND CLOUD COMPUTING ERA

The tremendously rapid popularization of smart phones has significantly impacted our daily lives. Smartphones are used not only for voice communication but also for various purposes such as information search (e.g., Web, Location-Based Services (LBS), etc.), E-commerce (e.g., on-line shopping, trading, etc.), and establishing social relationships (i.e., Social Networking Services (SNSs)). Meanwhile, in the last decade, various new technical advances such as Internet of Things (IoT), machine-to-machine (M2M), Intelligent Transport Systems (ITS), cloud computing, and crowdsourcing have become a big trend and have had significant impacts on both academic and social aspects.

Due to these trends, mobile and ubiquitous systems have become more significant and complex than ever before. More specifically, in all of the above advanced systems, smartphones are expected to play a significant role such as human-machine interface, data source for environmental monitoring (i.e., sensors for context detection) and user profiling, and computing capability (e.g., edge computing and off-loading). While the research communities of mobile and ubiquitous computing have spent considerable research effort in the past decade and established the maturity of some base technologies, a variety of challenges still remain in the new era of mobile and ubiquitous systems that we are now facing.

This Special Section in IEEE ACCESS focuses on research challenges to further advance the development of systems, applications, social networks, middleware, networking, data management and services, all with special focus on mobile and ubiquitous computing in advanced systems.

Through a solid review process, we have accepted 5 articles in this Special Section. The first article "Determining Smartphone's Placement through Material Detection, using Multiple Features Produced in Sound Echoes" by Tatsuhito Hasegawa, *et al.* presents a novel technique to recognize surface materials using sound echoes. This technique depends on the assumption that echoes differ in their properties, depending on smartphone's placement and the surface materials nearby. This article is expected to contribute to advancement of situational awareness in the real world. The second article "M2M Access with Dynamic Cognitive Virtual Operators: A Data Aggregator's Perspective" by Dapeng Li, *et al.* presents an aggregator-assisted model for machine-to-machine (M2M) communications, in which the data aggregator appropriately transmits aggregated M2M data to a cognitive operator. This model can enhance communication efficiency for wireless M2M communications.

The third article "Open IoT Ecosystem for Sporting Event Management" by Sylvain Kubler, *et al.* presents a framework that enables IoT service stakeholders to freely join, contribute, and benefit from an open IoT ecosystem. The practicability of this ecosystem, along with a performance analysis, is verified considering a proof-of-concept for enhanced sporting event management in the context of the forthcoming FIFA World Cup 2022 in Qatar.

The fourth article "Improving Activity Recognition Accuracy in Ambient Assisted Living Systems by Automated Feature Engineering" by Eftim Zdravevski, *et al.* presents a generic method for selecting robust features from a variety of sensors, which is useful for improving activity recognition accuracy in ambient-assisted living (AAL) systems. This method aims to make AAL systems affordable while providing reliable performance.

The fifth article "COSAP: Contract-Oriented Sensorbased Application Platform" by Takuma Oide, *et al.* presents a new sensor-based application platform based on a service configuration model that neither uses server nor cloud, and also reports a design and implementation of a contractoriented information flow protocol, which realizes flexible reflection of a provisioning policy on that platform. This platform is expected to contribute to flexible distribution of information according to a data provisioning policy.

TAKAHIRO HARA, Associate Editor

Department of Multimedia Engineering Osaka University Suita 565-0871, Japan

STEPHAN SIGG, Guest Editor

Aalto University 02150 Espoo, Finland

LEI SHU, Guest Editor

Nanjing Agricultural University, Nanjing 210031, China / University of Lincoln, Lincoln LN67TS, U.K.

FRANCESCO DE PELLEGRINI, Guest Editor CREATE-NET

Italy

CHIARA PETRIOLI, Guest Editor University of Rome "La Sapienza" 00185 Rome, Italy

SANJAY KUMAR MADRIA, Guest Editor Missouri University of Science and Technology Rolla, MO 65409, USA



TAKAHIRO HARA (SM'06) received the B.E, M.E, and Dr.E. degrees in information systems engineering from Osaka University, Osaka, Japan, in 1995, 1997, and 2000, respectively. Currently, he is a Full Professor with the Department of Multimedia Engineering, Osaka University. He has published over 440 journal and international conference papers in the areas of databases, mobile computing, peer-to-peer systems, WWW, and wireless networking. His research interests include distributed databases, peer-to-peer systems, sensor networks, and mobile computing systems. He served as a General Chair of the IEEE International Symposium on Reliable Distributed Systems (SRDS'14) and the International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (Mobiquitous'16). He served and is serving as a Program Chair of numerous international conferences, including IEEE International Conferences, on Mobile Data Management (MDM'06, 10, and 18), and the Advanced Information Networking and Applications (AINA'09 and 14), Mobiquitous'13, and IEEE SRDS'12.

including top-ranked ones such as WWW, CIKM, and MobiHoc. He guest edited the IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, Special Issues on Peer-to-Peer Communications and Applications. He is a Distinguished Scientist of ACM and a member of three other learned societies.



STEPHAN SIGG received the Ph.D. (Dr.rer.nat.) degree in computer science from the University of Kassel in 2008. He is currently an Assistant Professor with the Department of Communications and Networking, Aalto University. From 2013 to 2015, he was with the Computer Networks Group, Georg-August-University Goettingen. He was a Researcher at TU-Braunschweig and an Academic Guest with the Wearable Computing Lab, ETH Zurich and in the Nodes Laboratory, University of Helsinki. From 2010 to 2013, he was with the Information Systems Architecture Research Division, National Institute of Informatics. He was a Visiting Professor with the Distributed and Ubiquitous Systems, TU Braunschweig in 2010, a Post-Doctoral Researcher at the Chair for Pervasive Computing Systems (TecO), Karlsruhe Institute of Technology in 2010, and a Post-Doctoral Researcher at the Chair for Distributed and Ubiquitous Systems, TU Braunschweig from 2008 to 2010. He was with the Chair for Communication Technology, University of Kassel from 2005 to 2007. His research interests include the design, analysis, and optimization of algorithms for distributed and ubiquitous systems. Recently he has considered

problems related to context prediction, collaborative transmission in wireless sensor networks, context-based secure key generation, and device-free passive activity recognition and the computation of functions in wireless networks at the time of transmission.



LEI SHU (SM'16) received the Ph.D. degree in computer engineering from the National University of Ireland, Galway, Ireland, in 2010. Until 2012, he was a Specially Assigned Researcher with the Department of Multimedia Engineering, Osaka University, Japan. He is currently a Lincoln Professor with the University of Lincoln, U.K., and a Distinguished Professor with Nanjing Agricultural University, China. He has published over 350 papers in related conferences, journals, and books. His research interests include wireless sensor networks, multimedia communication, middleware, security, and fault diagnosis. He has received the Globecom 2010, ICC 2013, ComManTel 2014, and the IEEE Systems Journal 2017 Best Paper Awards. He served as a co-chair for over 50 various international conferences/workshops, and as a TPC member for more than 150 conferences. He is serving as an Associate Editor for the IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS, *IEEE Communications Magazine*, IEEE SYSTEMS JOURNAL, and IEEE ACCESS. He is a member of the IEEE ComSoc, the IEEE IES, EAI, and ACM.



FRANCESCO DE PELLEGRINI (Fondazione Bruno Kessler) received the Ph.D. in telecommunication engineering from the University of Padova in 2004. He is the Chief Scientist of the Distributed Computing and Information Processing Group. He serves as a Lecturer with the University of Trento and at the University of Avignon for the course of wireless networks (master's degree course). He has been involved in software-define networks location detection, multi-rate systems, routing, epidemics on graphs, wireless mesh networks, VoIP, *ad hoc*, and delay tolerant networks. His H-Index is 25. His expertise is in algorithms on graphs, the stochastic control of networks, and game theory. He was the Vice General-Chair for the first edition of ICST Robocomm and is one of the promoters of COMPLEX 2012. He has been the General Co-Chair for the 2012 edition of the IEEE NetGCoop, and the TPC Chair for the 2014 edition, a conference focused on game theory and control for networked systems. He is acting or has acted as the Project Manager for the several industry-funded projects. He has been the Coordinator for the FET EU Project CONGAS, where the focus is on the Dynamics

and COevolution in Multi-Level Strategic INteraction GAmeS. He has received the Best Paper Award at WiOPT 2014 and at NetGCoop 2016. He is currently the Principal Investigator of the H2020 FET Resource AuctiOning Engine for the Mobile Digital Market.



CHIARA PETRIOLI received the Ph.D. degree in computer engineering from Rome University "La Sapienza," Italy, in 1998. She is currently a Full Professor with the Computer Science Department, University of Rome La Sapienza, where she leads the Sensor Networks and Embedded Systems Lboratory. She also leads the Cyber Physical System Lab, "La Sapienza" Center for Cyber Intelligence and Information Security, and is a Founding Partner of "La Sapienza" spinoff WSENSE S.r.l. She was a Fulbright scholar. She has published over a hundred papers in prominent international journals and conferences (h-index 30, i-10 index: 76, over 3650 citations). Her research interests include the design and optimization of wireless, embedded, and cyber physical systems. She is member of the steering committee of ACM SenSys, the IEEE SECON, and Mobiquitous. She is the Program Co-Chair of the IEEE INFOCOM 2016, the Workshop Co-Chair of ACM MobiCom 2014, and the General Chair of ACM SenSys 2013. She has been a member of the steering committee and an Associate Editor of the IEEE TRANSACTIONS ON MOBILE COMPUTING and the IEEE TRANSACTIONS ON

VEHICULAR TECHNOLOGY, a member of the executive committee of the ACM SIGMOBILE, and has been the program co-chair of leading conferences in the field, such as the ACM MobiCom and the IEEE SECON. She has also been PI of over 20 national and international research projects and serving as coordinator of two EC projects (FP7 projects GENESI and SUNRISE). She regularly serves as a Reviewer for the European Commission.

. . .



SANJAY KUMAR MADRIA (SM'01) received the Ph.D. degree in computer science from IIT Delhi, India, in 1995. He is currently a Professor with the Department of Computer Science, Missouri University of Science and Technology (formerly, the University of Missouri-Rolla), USA. He was a Visiting Assistant Professor with the Department of Computer Science, Purdue University, West Lafayette, USA. He has published over 235 journal and conference papers in the areas of mobile computing, sensor networks, security, and cloud in general. He co-authored a book, *Web Data Management: A Warehouse Approach* (Springer-Verlag). He has given tutorials on mobile databases and cloud computing in many international conferences. He is a regular invited panelist in NSF, NSERC (Canada), Hong Kong Research Council, and the Sweden Council of Research. He has served as invited/keynote speaker in international conferences. He received the faculty excellence award for research in 2007, 2009, 2011, 2013, and 2015, the Japanese Society for Promotion of Science invitational Fellowship in 2006, and the Air Force Research Lab's Visiting Faculty Fellowship from 2008 to 2016. His research is supported by

multiple grants from the NSF, NIST, DOE, AFRL, ARO, UM research boards, and from industries such as Boeing. He is an ACM Distinguished Scientist and a speaker under the ACM Distinguished Visitor program.