
Editorial

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Biographical notes: Makoto Ikeda is an Assistant Professor at Fukuoka Institute of Technology (FIT), Japan. He was a Research Fellow in the Center for Asian and Pacific Studies, Seikei University, from April 2010 to March 2011. He received his BE, MS and PhD from FIT, in 2005, 2007 and 2010, respectively. He was a Japan Society for the Promotion of Science (JSPS) Research Fellow from April 2008 to March 2010. He has widely published in peer reviewed international journals and international conferences proceedings. He has served as PC member for many international conferences. He is a member of IEEE, ACM, IPSJ and IEICE. His research interests include wireless networks, mobile computing, high-speed networks, P2P computing, mobile ad hoc networks, wireless sensor networks and vehicle ad hoc networks.

Markus Aleksy received his Management Information Systems degree in 1998 and his PhD in 2002 from the University of Mannheim, Germany. He received his PhD in Information Science in 2007 from Tokyo Denki University, Japan. He lectured in University of Mannheim, Germany, and Queen's University, Canada. He is the author or co-author of more than 80 research papers published in international journals and conference proceedings. He was/is involved in the organisation of several conferences as a member of the steering committee, General (Co-)Chair, Programme (Co-)Chair, Workshop (Co-)Chair, etc. as well as a member of various programme committees. His current research focuses on distributed systems, mobile computing, and service science.

1 Introduction

The ongoing advances in wireless and sensing technologies, augmented reality, and the continued applicability of Moore's law make new advanced ubiquitous applications possible. However, to offer such applications on a larger scale and to merge them with existing applications and infrastructures is very difficult. Furthermore, the complexity of today's ubiquitous applications requires additional approaches to facilitate the development of such applications in a time- and cost-saving way. This includes the ability to invisibility and fusion management, seamless integration of ubiquitous wireless networking and sensing technologies as well as management of context information to address the complexity of ubiquitous applications.

This special issue of the *IJSSC* on advances in ubiquitous communications, sensing, and applications contains extended versions of the best papers from the 13th International Conference on Network-Based Information Systems (NBIS-2010) hosted at Hida Earth Wisdom Center, Takayama, Gifu, in Japan on September 14–16, 2010. Since 1998, NBIS has been an annual event bringing together

researchers, practitioners and users interested in various aspects of network-based information systems.

This issue reflects the breadth of ubiquitous computing topics.

2 Contents of this issue

There are eight papers, each of which is concerned with a specific aspect of ubiquitous computing.

The first paper by Ishida et al. focuses on VR technology and tele-immersion technology. The authors have constructed a system facilitating the presentation of and interaction with traditional crafts and evaluate its performance by many experimental results.

In the second paper, Yamagiwa et al. study the importance of mobile internet access and search services for mobile phones provided by search engines. The authors propose a method that predicts the number of sales in the next term based on the RFID data. Also, they evaluate the proposed method efficiency based on the data collected from two branches of an apparel company.

In the third paper, Yu et al. present a web-based system for controlling home appliances remotely. The authors propose a remote control model for conversional appliances in a smart home environment. Based on the proposed model, a smart home portal combined with video surveillance system was built to realise conversional appliance control in smart home.

The fourth paper by Boyinbode et al. describes a comprehensive survey of different clustering algorithms that have been used to support data aggregation processes in wireless sensor network environment. The authors compare these algorithms based on metrics such as residual energy, uniformity of cluster head distribution, cluster size, delay, hop distance and cluster formation methodology.

In the fifth paper, Pužar and Plagemann, present the MIDAS data space (MDS) and give some examples on how MDS manages consistency of data in cases when the network is partitioned and merged. Additionally, the authors present an extensive study of different replica placement strategies for MDS.

In the sixth paper, Martins and Guyennet deal with security in wireless sensor networks. They show the specific problems and vulnerabilities of wireless sensor networks. The authors discuss about different solutions made by the scientific community to secure wireless sensor networks.

The seventh paper authored by Yuriyama and Kushida presents sensor-cloud infrastructure which virtualises physical sensors in order to share them without concerns to the details of their location and specification.

The proposed infrastructure enables end-users to create virtual sensor groups dynamically by selecting the templates of virtual sensors or virtual sensor groups with IT resources.

In the last paper, Sakurai proposes a new method that efficiently uses the RFID data collected from apparel shops. This method learns prediction models from the data by utilising data mining techniques. Furthermore, the author proposes two step-wise methods in order to acquire the models. He verifies the efficiency of the proposed method through numerical experiments based on the RFID data collected from two branches of an apparel company.

The presented papers illustrate the heterogeneity of this research field, demonstrating the many facets of ubiquitous computing amplifying the challenges this area has to face. We believe that this special issue will provide new insights and ideas to researchers and developers in the areas of space-based and situated computing, thus, inspiring them to provide new contributions in this research field. We hope that you will enjoy the selected highlights of the NBIS 2010.

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