
Editorial

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Biographical notes: Boon-Chong Seet obtained his PhD in Computer Engineering from Nanyang Technological University, Singapore, in 2005. Upon graduation, he was recruited as a Research Fellow under the Singapore – Massachusetts Institute of Technology Alliance programme at National University of Singapore. In 2007, he was awarded as a Visiting Scholarship by ETSI Telecommunications of Technical University of Madrid, to pursue postdoctoral research under an EU-funded project on multi-disciplinary advanced research in user-centric wireless network enabling technologies (MADRINET). Since December 2007, he is serving as a Faculty Member in the Department of Electrical and Electronic Engineering at Auckland University of Technology, New Zealand.

Ana M. Bernardos is a Research Fellow of Centre for Technology Diffusion in Telecommunications School of the Universidad Politécnica de Madrid (UPM), Spain. She received her PhD in ‘Communications Technologies and Systems’ in 2008. Since 2005, she conducts research in context-aware systems, location technologies and data fusion for ubiquitous computing. She has co-authored more than 50 papers, books and book chapters, and participated in cooperative

research projects. She has been a Professor in Project Management and other disciplines at UPM and Universidad Carlos III, and coordinates the Observatory on Mobile Technologies and Services of the Centre for Technology Diffusion.

Adnan Al-Anbuky has been involved in academic and industrial projects relevant to wireless sensor network and distributed sensing. His research engagement with Powerware NZ (currently Eaton) has led to a breakthrough in the way telecommunication DC power is being monitored. Both distributed intelligent sensing and remote monitoring were the main drivers towards sustaining the standby power. The establishment of the Centre for Sensor Network and Smart Environment (SeNSE) in mid-2006 has led to projects that would benefit both local and international communities. Of these are wildlife opportunistic network, Auckland passive home ambient intelligence, and object centric thermal mapping.

José R. Casar received his PhD in 1983 from Universidad Politécnica de Madrid (UPM), where he holds a Chair in the Department of Signals, Systems and Radio Communications. During 1995, he was the Deputy Vice-President for Research of UPM, from 1996 to February 2000 Vice-President for Research at the same University and Adjunct to Rector for Strategic Programs from February 2000 to June 2004. Currently, he is Head of Signal and Data Processing Group and of the Centre for Technology Diffusion at UPM. He has published more than 200 papers and led more than 70 financed research projects.

1 Introduction

The vision of ambient intelligence (AmI) (ISTAG, 2001) is a world of digitally augmented physical environment where the ubiquitous and transparent presence of embedded networked sensing systems support and enrich the well-being, productivity and lifestyles of human beings (Aarts et al., 2006). Sensor networks (Bose, 2009) are an enabling technology of ambient intelligence: the pervasive nature of unobtrusive sensors distributed in the environment, either deployed as infrastructure, embedded in materials or augmented objects, or transportable by mobile carriers, enables the fine-grain capture of environmental or ambient information that provides the basis of intelligence for higher-order cognitive systems, that is, systems with capabilities to perceive, reason, learn and react intelligently in order to take performance or service decisions. Such systems, in turn, are envisioned to have wide ranging applications, from intelligent wildlife and building structure monitoring, to humanistic and social endeavours such as health and elderly care service provisioning (Casari et al., 2009).

This Special Issue on *Ambient Sensing and Intelligence for Distributed Pervasive Applications* is organised to show some of the recent research results, with the aim to foster and stimulate future innovations within the research community in cross-disciplinary designs and methodologies in the fields of sensor networks and ambient intelligence. Through a rigorous double-blind review process, which involved known specialists in the fields from both academia and industry, three papers are selected for publication in this issue.

The Special Issue opens with a paper on ‘An ambient intelligence framework for large-scale eco-aware systems’ by M. Iqbal and H.B. Lim, which describes the design of an architecture aiming to support a greater vision of ambient intelligence that extends beyond single spaces towards interconnected ones. The authors introduce the concepts of grid computing and sensor networks into AmI and propose the smart sensor grid (S2G) architecture, which forms a resource sharing backbone to provide access to heterogeneous data, computational and storage resources, from multiple sensors, multiple organisations and multiple systems. An ecological awareness application is shown as a test bed of the proposed architecture.

The second paper on ‘Wireless sensor network system for supporting nursing context-awareness’ by F. Naya et al., addresses a very relevant field of location and activity information inference in a hospital environment. A complete pipeline from multi-modal sensing, activity classification and information management is presented. The authors also implemented a heterogeneous network system that observes and records nursing activities, as well as allowing nurses to share their location information in real time. The approach presented in the paper addresses many challenges in context inference, in particular on location and activity.

Finally, the third paper on ‘Data stream mining for wireless sensor networks environment: energy efficient fuzzy clustering algorithm’ by H. Sabit et al., presents a distributed data clustering method based on a fuzzy logic for sensor networks. Named SUBFCM, which combines subtractive clustering with fuzzy C-means, each cluster head classifies the sensing data of its cluster nodes into several groups, and transmits only the representative of each group. Through both computer simulations and real experiments, the authors successfully demonstrated the effectiveness of the proposed method in reducing the amount of data transmissions and therefore the amount of energy spent in communication.

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