Preface

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Biographical notes: Runhe Huang received her BSc in Electronics Technology from the National University of Defense Technology, China, in 1982, and her PhD in Computer Science and Mathematics from the University of the West of England, UK, in 1993. She worked at the National Defence University of Technology as a Lecturer during the period 1982–1988. She worked in the University of Aizu for seven years. She is now a Professor in Hosei University. Her research fields include computer-supported collaboration working, artificial intelligent applications, multimedia and distributed processing, genetic algorithms, distributed multi-agents, ubiquitous computing and mobile computing.

Akio Koyama is a Professor in the Department of Informatics, Yamagata University, Japan. He received his BE and PhD Degrees from Yamagata University in 1987 and 1998, respectively. He has published about 100 papers in refereed journals and international conference proceedings. He has been a PC Member of many international conferences and has served as General Co-Chair of MNSA-2005 and Workshop Co-Chair of AINA-2008 and CISIS-2009. His research interests include routing protocols, ad-hoc and sensor networks, agent based systems, medical and healthcare systems and mobile communication systems. He is a member of IEEE Computer Society, IPSJ and IEICE.

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The success of all-IP networking and wireless technology has changed the ways of living for the people around the world. The progress of electronic integration and wireless communications is going to pave the way to offer people the access to the wireless networks on the fly, based on which all electronic devices will be able to exchange the information with each other whenever necessary.

Ubiquitous computing is an emerging field of research for computing paradigms in the 21st century. This emergence is the natural result of research and

technological advances mainly in wireless communications, mobile computing, embedded computing, autonomic computing and agent technologies. The goal of ubiquitous computing is to enable the fabrics of everyday life with seamless and intelligent computers, devices, technologies and services.

The aim of this special issue is to present the innovative researches, and technologies as well as developments related to ubiquitous computing, mobile networking and wireless communications. We received 30 papers for this special issue and we accepted five papers based on their quality and suitability to the special issue.

In the first paper, Jiang et al. propose a finite-state-model scheme for efficient cooperation enforcement in mobile ad-hoc networks. With the proposed technique, misbehaving node detection is performed on demand. Also, the node punishment and avoidance are accomplished by maintaining reputation information only within neighbouring nodes. The proposed method simplifies the collaboration enforcement process, incurs little overhead and is robust against various evasive behaviours.

In the second paper, Manulis and Sadeghi present μSTR-H: a CGKA (Contributory Group Key Agreement) protocol for heterogeneous mobile ad-hoc groups that fulfils not only common security requirements for CGKA protocols but also additional requirements of their proposed model. The proposed protocol considers a fair distribution of costs between mobile devices according to their performance capabilities. The authors carry out the security analysis of the proposed protocol and show that it fulfils the security requirements.

In the third paper, Shi et al. deal with error analysis of quantised RSSI-based sensor network localisation. They formulate the problem of localisation using quantised RSSI as a parameter estimation problem and derive the Cramer-Rao lower bound for the localisation problem. The authors also present the effect of quantisation level and network configuration parameters on the lower bound of localisation errors variance to achieve better understanding of the relationship between network configuration and localisation accuracy.

In the fourth paper, Yin et al. propose a two-level topology control strategy for energy efficiency in wireless sensor networks by dynamically integrating two approaches: transmission range and active-subnetwork. The transmission range changes of nodes affect how to form the active subnetwork, while topology changes in the active subnetwork affect how to determine the transmission range of nodes. The authors show by simulations that two-level topology control strategy achieves better performance in terms of energy saving than both active-subnetwork and transmission ranges approaches.

In the fifth paper, Guan et al. present an analytical framework for the performance evaluation of AQM-scheme-based congestion control mechanism in WLANs. They carry out a comprehensive performance comparison for various dropping strategies to see the impact of AQM scheme on WLANs using queue thresholds. The proposed analytical models are based on AQM principles adopted in WLANs, which take into account the reduction of incoming traffic arrival rate owing to packets dropped probabilistically and the drop probability increases linearly with the increasing system contents. For an independent Bernoulli stream, the objective functions have been found for the threshold with parameters delay, throughput and loss probability. The typical numerical results clearly demonstrate how different load settings based on queue thresholds can provide different trade-offs between throughput, loss probability and delay to suit different service requirements.

As we conclude this overview, we would like to thank all the authors for submitting their papers and the reviewers for their good work to make it possible to publish this special issue.