Introduction

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Biographical notes: Joseph Kee-Yin Ng received a BSc, MSc, and a PhD in Computer Science from the University of Illinois at Urbana-Champaign in 1986, 1988, and 1993, respectively. He joined Hong Kong Baptist University in 1993, and is a Professor in the Department of Computer Science. His current research interests include real-time networks, multimedia communications, ubiquitous/pervasive computing, and distributed computing. He is the Chair of the Steering Committee of RTCSA and a Member of the International Advisory Committee for AINA. He also served as Program Chairs or General Chairs for numerous International Conferences as well as Associate Editors or Editorial Board Members on a number of International Journals. He is the Region 10 Coordinator for the Chapter Activities Board of the IEEE Computer Society, and is the Coordinator of the IEEE Computer Society Distinguished Visitors Programme (Asia/Pacific). He is a Senior Member of the IEEE and has been a Member of the IEEE Computer Society since 1991. He had Chaired and served as Officers of IEEE HK, and IEEE HK Computer Chapter since 1993 and had received numerous awards and certificates from IEEE, and IEEE Computer Society. He is also a Member of the IEEE Communication Society, ACM, Hong Kong Computer Society, and the Founding Member and Treasurer for the Internet Society (ISOC)-Hong Kong Chapter.

Leonard Barolli received BE and a PhD from Tirana University and Yamagata University in 1989 and 1997, respectively. From April 1997 to March 1999, he was a JSPS Post Doctor Fellow Researcher at the Department of Electrical and Information Engineering, Yamagata University. From April 1999 to March 2002, he worked as a Research Associate at the Department of Public Policy and Social Studies, Yamagata University. From April 2002 to March 2003, he was an Assistant Professor at the Department of Computer Science, Saitama Institute of Technology (SIT). From April 2003, he was an Associate Professor and presently is a Professor at the Department of Information and Communication Engineering, Fukuoka Institute of Technology (FIT). He has published about 250 papers in referred Journals and International Conference Proceedings. He was an Editor of the *IPSJ Journal* and has served as a Guest Editor for many International Journals. He has been a PC Member of many International Conferences. He was the PC Chair of AINA-2004 and is the PC Chair of ICPADS-2005, MNSA-2005 and NBiS-2005. His research interests include agent-based systems, distance learning, network traffic control, fuzzy control, genetic algorithms. He is Member of SOFT, IPSJ, IEEE Computer Society and IEEE. He received many research awards and funded research grants. He received the appreciation certificate from IEEE Computer Society in 2004.

Jianhua Ma is a Professor in the Faculty of Computer and Information Sciences of Hosei University since 2000. Previously, he had worked for seven years at NUDT and three years at Xidian University and five years at the University of Aizu, respectively. His research interests are ubiquitous/pervasive computing, mobile multimedia, P2P communications, collaborative systems, proactive and autonomic multiagents, location/context aware applications, integrations of digital cyber world and physical real world, etc. He is a Member of IEEE and

ACM. He is an Editor-in-chief of the *International Journal of Mobile Multimedia* and an Assistant Editor-in-chief of *International Journal of Pervasive Computing and Communications*. He is on the Editorial Board of the *International Journal of Computer Processing of Oriental Languages*, the *International Journal of Distance Education Technologies* and the *International Journal of Wireless and Mobile Computing*. He has edited about 10 international journal Special Issues as a guest editor. He is a Foundation Member of the International Consortium of Macro University, a federation of virtual universities started from 1999. He organised the 6th International Conference on Distributed Multimedia Systems (DMS'99) as PC Co-Chair, the first International Symposium on Cyber Worlds (CW'02) as one of founders and PC Co-Chairs and the 18th IEEE International Conference on Advanced Information Networks and Applications (AINA'04) as a General Co-Chair. He has severed many other international conferences/workshops as various chairs and committee members. He received the Annual Excellent Paper Awards from China Information Theory Society, Electronics Society and Association of Human Science and Technology in 1985, 1986 and 1991, respectively. He received the Best Paper Award from the International Conference on Information Society in the 21st Century (IS2000). He received the appreciation certificate from IEEE Computer Society in 2004.

In recent years, there has been rapid development in high-speed computing, mobile communications and deployment of wireless communication infrastructure. For wireless and mobile communications, the dominant technologies have been the IEEE 802.11 WLAN and various cellular networks. On the device side, there is a wide spectrum of devices including laptops, palmtops, PDA and cell phones. Advances in these technologies have engendered a new paradigm of computing. Users now have the opportunity in accessing information anywhere and at any time. Because of the above advances in technology, data and resource management, power consumption, reliable transmission, transparent network services and security are among the key problems in wireless and mobile computing. In view of the above, this issue is focused on the design and development of applications, services and infrastructure to support and facilitate wireless and mobile computing.

This special issue deals with applications, services and infrastructure for wireless and mobile computing. We received many paper submissions, but based on the review results and the relevance of the papers with the special issue, we selected 10 papers which are split into two parts: four papers on infrastructure and the other six papers on service and applications.

On infrastructures, in view of the importance of efficient and effective communications among mobile robots, Arai, Koyama and Barolli proposed an Adaptive Reservation-Time Division Multiple Access MAC protocol which can adapt to the changes in numbers as well as reducing the packet collision probability among robots.

Real-time routing is another import issue for facilitating good communications and subjected to scale up problems. On this front, Durresi proposed a constraint-based routing strategy for real-time traffic over a multilayered hierarchical satellite architecture which considers both the quality and the bandwidth availability. On the other hand, Paik, Cho, Ernst and Choi address the protocol scale up issues arising from the use of multiple mobile routers and analyse the influence of mobility on load sharing and session preservation when multiple routers are used.

Furthermore, when dealing with multichannel data broadcasting in mobile databases, special indexing schemes should be used. Waluyo, Srinivasan and Taniar had done a simulation study among non-replicated, partially replicated and fully replicated indexing schemes for better system performance measured by access time. We then turn our focus to providing mobile services and location-aware computing. Inayat, Aibara and Nishimura had shown that a seamless intra-network and inter-network handoff mechanism could be achieved by proper management of multiple network interface such that internet mobility transparency could be provided. Speaking of mobility and location-aware computing, Chu, Leung, Ng and Li had provided a new propagation model in estimating the location of mobile phones within a mobile phone network.

Besides the mobile phone networks, sensor networks also play an important role in providing diverse services to location-based applications. Wong, Tsuchiya and Kikuno proposed a self-organising algorithm for sensor placement in wireless mobile microsensor networks. Through simulations, they proved that the proposed algorithm is effective in providing a good coverage for collecting and dispatching sensor data. Furthermore, on sensor networks, Isoda, Kurakake and Imai propose a user activity assistance system that employs a state sequence description scheme to describe the user's contexts and their system was shown to be effective in acquiring the user's spatio-temporal context which is crucial to ubiquitous computing.

Lastly, we have included two papers that provided unique services on top of our wireless and mobile infrastructures. While Zhang and Chan had presented their design and analysis of a mobile auction service based on mobile agents, Wakahara et al. presented a new voice objective measurement method for Voice over IP (VoIP) which is validated by experiments.

We hope that this Special Issue will lead to a better understanding on the applications, services and infrastructures for wireless and mobile computing. These works, we believe, can be of great interest for the researchers in the fields of communications, inter-networking and wireless and mobile networks.

As we conclude this overview, we would like to thanks all the authors for submitting their papers and a great thank to all the reviewers for their comments and suggestions to improve the papers' quality.

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