
Preface

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Biographical notes: Jason C. Hung is an Associate Professor of the Department of Information Management, Overseas Chinese University, Taiwan. His research interests include multimedia computing and networking, distance learning, e-commerce and agent technology. He received his PhD in Computer Science and Information Engineering from Tamkang University in 2001. He participated in many international academic activities, including the organisation of many international conferences. He is the Associate Editor of *International Journal of Distance Education Technologies*, published by Idea Group Publishing, USA.

Kuei-Ping Shih received his BS in Mathematics from Fu-Jen Catholic University, Taiwan, in 1991 and PhD in Computer Science and Information Engineering from National Central University, Taiwan, in 1998. After two years of military obligation, he joined the Faculty of the Department of Computer Science and Information Engineering, Tamkang University, Taiwan, as an Assistant Professor in 2000. He served as a Programme Area Chair in the IEEE International Conference on Advanced Information Networking and Applications (AINA), 2005, and as a Technical Track Chair in the IEEE International Conference on Information Technology: Research and Education (ITRE), 2005. His research interests include wireless networks, sensor networks, mobile computing and network protocols design. He is a member of the IEEE Computer and Communication Societies and Phi Tau Phi Scholastic Honor Society.

Wireless communication and networking technology has been received much attention in the last decade. In particular, wireless sensor networks, Bluetooth networks and wireless ad-hoc networks are deemed as the next-generation mobile systems. Research in these systems is emergent and crucial, not only in academic and research community, but also in industrial field. The special issue focuses on the state-of-the-art wireless networking technology related to these issues. Eleven papers are included in this special issue.

Wireless sensor network is a new research topic in wireless network fields and has attracted much attention recently. The deployment of wireless sensors or mobile agents is an important problem for wireless sensor networks. The first paper, entitled 'Small-world effects in wireless agent sensor networks' by K.A. Hawick and H.A. James, designs a model for describing and analysing the coverage graph of mobile agents or mobile sensors. The concept of 'short-cut' to reduce the all-pairs average distance and the number of isolated clusters is proposed in the paper. The small-world effects that arise from particular geometric networking arrangements are also described.

Bluetooth, characterised as a low-power, low-cost and short-range wireless radio technology, is a new emerging technology for wireless Personal Area Networks (PANs). It enables three application scenarios: cable replacement, data and voice access points, and ad-hoc networking. Bluetooth has attracted a lot of attentions in research and commercial developments recently. The next paper, 'Programmable agents for efficient topology formation of Bluetooth scatternets' by Sergio González-Valenzuela, Son T. Vuong and Victor C.M. Leung, proposes a Bluetooth scatternet formation protocol based on mobile agent technology for the interconnection of a large set of Bluetooth-enabled devices. The effectiveness of the proposed protocol is demonstrated through extensive simulations.

Routing is an essential capability for Bluetooth networks. Improving the performance of routing on Bluetooth networks is also an important issue. The next paper, 'A Bluetooth routing protocol supporting minimum average transmission latency' by Gwo-Jong Yu, proposes a minimum delay routing protocol for Bluetooth networks. On the basis of the queuing theory, the relation between traffic flow and delay time is derived. Three delay time

estimation models are proposed and analysed as well. Experimental results demonstrate that the proposed routing protocol indeed has smaller delay time in comparison with the related work.

Wireless ad-hoc networks are dynamically formed by mobile stations without the assistance of fixed infrastructures. The integration of wireless ad-hoc networks and fixed IP networks to support QoS is an interesting and important issue for wireless ad-hoc networks. The next paper, 'An interaction model for QoS support in ad hoc networks connected to fixed IP networks' by M.C. Domingo and D. Remondo, proposes a new protocol, named Differentiated Service-Stateless Wireless Ad Hoc Networks (DS-SWAN), to enable the connection of wireless ad hoc networks to internet and support end-to-end QoS. Simulation results show that DS-SWAN offers good QoS guarantees for real-time flows without starvation of background traffic.

From MAC point of view, the next paper, entitled 'A routing-profitable MAC protocol for Mobile Ad Hoc Networks' by San-Yuan Wang, Lain-Chyr Hwang, Tzu-Chiang Ma and Chia-Hsu Kuo, proposes a novel protocol to increase the transmission possibilities of the receiving stations on the route from the source to the destination. To do so can reduce the contention between the relaying stations. The possibility of congestion at the relaying stations can also be reduced. The end-to-end latency can be reduced as well. Thus, the routing performance can be enhanced accordingly. Extensive simulations via ns2 are also provided.

Rapid changing of topology is a major challenge in designing wireless ad-hoc networks. The next paper, entitled 'A server selection algorithm for group mobility' authored by Namkoo Ha, Byeongjik Lee, Sungho Hwang and Kijun Han, addresses the problems of group mobility for the network partition in any direction, at any speed, and with different coverage of groups. The authors propose a method to predict the network partition time and provide a server selection algorithm for each partitioned group. Through analytical and simulation results, the authors show that the proposed algorithms can predict partition time and find group servers accurately.

The seventh paper entitled 'Modelling synchronisation of a coordination system' by Anthony Y. Chang and Jason C. Hung develops a general, theoretical computational model for discussing synchronisation and specification scheme. They analyse the domains of relationships between agents in a coordination system. A set of algorithms is proposed to derive reasonable relations between agents. Possible conflicts in the agent specification are first detected and eliminated. Several computation tables are proposed, and each table includes a set of complete logics.

Recent developments in the use of the internet underline the importance of agents in information-intensive applications. The eighth paper entitled 'Speeding-up information retrieval with the employment of a multi-agent

system', written by Irene Sygkouna and Miltiades E. Anagnostou, focuses on Mobile Agents and their use for information retrieval. A multi-agent system is considered. Their objective is to find the routes of the agents so that the total completion time is minimised. The system design goal of producing an 'optimal' answer with minimal use of communication and processing resources is the driving reason for testing three heuristic algorithms.

Advances in Wireless Sensor Network (WSN) research and technology are fuelling trends towards highly distributed wireless sensors organised to collaborate in accomplishing increasingly complex tasks. The next paper entitled 'Agents in Service-Oriented Wireless Sensor Networks' by Shawn. A. Bohner, Bradley Hartman, Mohamed Eltoweissy and Denis Gračanin proposed a map readily to the Service-Oriented WSN (SOWSN) model layers. This paper explores the synergy between WSN and software agent technologies to manage growing complexity of future sensor network applications, revealing key parallels that lend themselves to emergent applications.

With the rapid growth of the internet and communication technologies, many real-world activities were applied on the internet, including education, entertainment, academic activities, commerce, etc. The 10th paper entitled 'A framework of online chain store integrated with personalised recommendation for e-commerce', written by Jason C. Hung, Yu-Bing Wang, Lawrence Y. Deng, Schummi Yang and Chun-Hong Huang, proposed the nomadic media server (mobile media server) to achieve the maximum use of network bandwidth. In this paper, they analyse customers' behaviour and interests, and recommend something useful to them based on the correlation among customers, product items and product features. And, they propose a recommendation system for the e-commerce portal/site, which will help merchants to make suitable business decision and delivery personalised information to the customers.

With the explosion of demand for wireless communication services, scarcity of spectrum poses a great challenge to wireless networking. In the final paper, entitled 'On the architecture of Authentication, Authorisation, and Accounting for real-time secondary market services' by Yihong Zhou, Dapeng Wu and Scott M. Nettles, they present an AAA system architecture, and propose a set of mechanisms to authenticate and authorise secondary users, synchronise multiple secondary devices, and manage real-time secondary market services. Furthermore, authors address the accounting issue and examine the pricing strategies associated with accounting.

The guest editors thank the authors for their contributions to the special issue. The most important thing is that readers will enjoy reading all these papers.