Editorial for Chinacom2010 Special Issue

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This special issue features four selected papers with high quality from the conference Chinacom 2010, which was held in Beijing, China, August 25–27, 2010. The first article, “Distributed Active Sensor Scheduling for Target Tracking in Ultrasonic Sensor Networks”, from Fan Zhang, Jiming Chen, Hongbin Li, Youxian Sun, and Xuemin (Sherman) Shen, investigates sensor scheduling issues in target tracking systems using ultrasonic sensors. The essential problem is how to select proper sensors at the right time to achieve better target tracking performance including tracking accuracy and reduced energy-consumption. Traditional approaches have some drawbacks. For example, periodic sensor scheduling simply picks each sensor in turn to detect the target without considering if the selected sensor is in the vicinity of the target or not. In order to overcome those shortcomings in existing schemes, the authors propose distributed and dynamic sensor scheduling (DSS), which leverages carrier sense multiple access (CSMA) to distributed coordinate tasking sensors so that only one sensor close to the vicinity of the target triggers ranging operation at a time. As a result, inter-sensor interference is removed. In addition, the current tasking sensor will stop ranging operation immediately once it completes so that

other sensors can perform ranging. As well demonstrated in extensive simulations and real experiments, DSS achieves higher tracking accuracy and scalability than existent solutions especially under large scale ultrasonic sensor networks.

It is envisioned that future Internet will be content-centric. Although different types of contents will co-exist, video is currently and will likely remain the major source of content in future Internet. Its volume in Internet and mobile cellular networks has been rapidly escalated in recent years and undoubtedly will keep increasing with the deep penetration of smart end devices such as smart phones and tablelets. How to support existing and emerging content applications including video streaming becomes critical towards the future Internet evolution. The second article entitled “A Novel P2P VoD Streaming Technique Integrating Localization and Congestion Awareness Strategies” co-authored by Mostafa M. Fouda, Zubair Md. Fadlullah, Mohsen Guizani, and Nei Kato, proposes a new video-on-demand (VoD) architecture based on mesh-based peer-to-peer (P2P) overlay networks. The main idea is to incorporate the congestion status (i.e. available bandwidth for uploading) at the source node and other peer nodes to select the most appropriate peers for pre-fetching. Simulation results show that the new scheme achieves good performance including low startup delay and high playback rate.

The third article, “Throughput Maximization in Cognitive Radio System with Transmission Probability Scheduling and Traffic Pattern Prediction” from Yang Cao, Daiming Qu, and Tao Jiang studies dynamic spectrum access in cognitive radio systems, which is one of the promising techniques for solving spectrum scarcity and efficiency issue for future wireless communications. The authors propose a transmission probability scheduling (TPS) for secondary users (SU) while guaranteeing that the impact (i.e. collision probability) on the primary users (PU) is below the desired value. Instead of deterministic transmission, TPS instructs each SU to transmit

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(occupy the channel) in each time slot with a probability. The author deduces the optimal transmission probability to maximize the SU throughput. Other factors, such as sensing error and PU traffic uncertainty, are also thoroughly considered. Although TPS is sensitive to sensor errors, the authors came up with a hidden Markov model (HMM)-based prediction technique to enhance TPS further.

In intermittently connected mobile networks (ICMNs), there are no reliable end-to-end paths from a source node to a destination node. In order to provide reliable data transmission in those challenging networks, many dissemination-based routing (DR) protocols are proposed. In the last article entitled “Dissemination-based Routing Protocol with Network-layer Error Control for Intermittently Connected Mobile Networks”, the authors investigate DR protocols for ICMNs, DR protocols usually forward a packet more than one time to increase the probability that the packet is received by the destination node. With DR protocols, the intermediate nodes and the destination node may receive multiple copies of the same packet. Based on this character of DR protocols, the authors first propose a novel network layer error recovery method, referred to as NER. The NER employs “multi-copy re-combining” to recover a packet from multiple partially erroneous copies of the original packet. Furthermore, the NER is integrated into the epidemic routing protocols and a new routing protocol named NER-DRP is proposed. Comprehensive simulations show that NER-DRP increases end-to-end packet delivery ratio and reduces end-to-end latency.

The guest editors are thankful to our reviewers for their effort in reviewing the manuscripts. We also thank the Editor-in-Chief, Dr. Imrich Chlamtac for his supportive guidance during the entire process.

Hsiao-Hwa Chen currently is a Distinguished Professor in Department of Engineering Science, National Cheng Kung University, Taiwan, and he was the founding Director of the Institute of Communications Engineering of the National Sun Yat-Sen University, Taiwan. He received BSc and MSc degrees from Zhejiang University, China, and PhD degree from University of Oulu, Finland, in 1982, 1985 and 1990, respectively, all in Electrical Engineering. He has authored or co-authored

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Chonggang Wang received his Ph.D. degree in computer science from Beijing University of Posts and Telecommunications (BUPT), China in 2002. He is currently with InterDigital Communications focusing on Machine-to-Machine (M2M) communications and Internet of Things (IoT) R&D activities including university collaboration and standardization such as ETSI TC M2M, IEEE, IETF, and 3GPP. Before joining InterDigital, he had conducted research with NEC Laboratories America, AT&T Labs Research,

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In the framework of the Mobile VCE, he has pioneered research on distributed cooperative space-time encoded communication systems, dating back to December 1999. He has published around 150 technical journal and conference papers at a citation h-index of 26 and citation g-index of 55, holds a dozen patents, authored, co-edited and contributed to 19 books, has given 25 international short-courses, and participated in various standardisation

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