
Editorial

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Biographical notes: Han-Chieh Chao is, currently, a Jointly Appointed Professor in the Institute of Computer Science and Information Engineering and the Institute and Department of Electronic Engineering at National Ilan University, Taiwan; Jointly Adjunct Professor in the Institute and Department of Electrical Engineering at National Dong Hwa University, Taiwan and Honorary Adjunct Professor in Beijing Jiaotong University (985 University), Xiamen University (985 University), Lanzhou University (985 University) and Yantai University, China. His research interests include high-speed networks, wireless networks, IPv6-based networks, digital creative arts and digital divide. He is an IEEE Senior Member, a Fellow of the IET (IEE).

Whai-En Chen received a BS in EE from Tam Kang University in 1997, and received a PhD in Computer Science from National Tsing Hua University in 2002. He began serving as a Research Assistant Professor in National Chiao Tung University from 2002 to 2007. Since August 2007, he served as an Assistant Professor in the Institute of Computer Science and Information

Engineering (CSIE) and the Division Head in the Network Division of Computer Center in National Ilan University. Since September 2008, he served as the Chairman of Institute of CSIE. His research interests include IPv6, VoIP, IMS, LTE and WiMAX.

Tin-Yu Wu is working as an Assistant Professor in the Department of Electrical Engineering, Tamkang University, Taipei, Taiwan. He received his MS and PhD in Department of Electrical Engineering, National Dong Hwa University, Hualien, Taiwan, in 2000 and 2007, respectively. His research interests focus on the next generation internet protocol, mobile computing and wireless network.

Next generation network (NGN) is a concept of network integration. Through transmitting the packets, users are able to access the needed network services by QoS. NGN basically has two characteristics: first, the service supply and the transmitting technology of the sub-layer are not related; and second, although NGN is integrated by multi-networks, users' mobility is unobstructed and unlimited. In NGN environment, the service supply and the management of the sub-layer network are separated. Nowadays, WiMAX technology provides an easy, time-saving and low-cost method for the deployment of the NGNs.

The wireless broadband network technology has been developed and the demand for wireless network keeps increasing. The wireless network is extensively used from the personal wireless network IEEE802.11 system to the latest 3G telecommunication network. The application of wireless network system is adopted not only in data and voice transmission but also in video streaming. For the video streaming, it needs wide bandwidth network as IEEE 802.16 metropolitan area network (wireless MAN).

IEEE 802.16 is also known as WiMAX and its extensions (i.e. 802.16a, 802.16d, 802.16e, 802.16g) are proposed for broadband wireless access and WiMAX, a solution for last mile access. In addition, a NGN is an advanced, packet-based network that exploits multiple broadband, QoS-enabled transport technologies to provide telecommunication services. With WiMAX, NGN can provide wide area and broadband services to NGN subscribers. Thus, integration of WiMAX in NGN becomes an emerging research area and should be carefully examined and studied. This special issue is intended to foster state-of-the-art research in the area of NGN and are expected to focus on all aspects of NGN and to present novel results and solutions to solve various problems and challenges foreseen in future NGNs.

The call for papers are intended to foster state-of-the-art research in the area of NGNs and are expected to focus on all aspects of NGNs and to present novel results and solutions to solve various problems and challenges foreseen in future NGNs. The special issue had selected best papers from the Mobility 2008 Conference and attracted submissions from a lot of topics in the field of the WiMAX integration in NGNs.

We strongly believe that the selected papers make a significant contribution to researchers, practitioners and students working in the area of the *Int. J. Autonomous and Adaptive Communications Systems (IJAAACS)* and in the specific field of WiMAX integration in NGN.

We are grateful to authors for their research contributions in this special issue. Furthermore, the Guest Editors wish to gratefully acknowledge all those who have generously given their time to review the papers submitted to this special issue.

The first paper, 'Unified WiMAX network design with service optimisation' by V. Teterin, S. Hurley and S.M. Allen presents an automated framework for the operational planning of WiMAX networks. The framework consists of a cell-planning algorithm which selects and fully configures base station sites, together with an automatic frequency planning algorithm for assigning sub-channels in an OFDMA scheme. The results reveal that simultaneous implementation of ACP and AFP yields network plans with performance indicators improved by a factor of 10 compared to the traditional way of planning consecutively.

The second paper, 'Fast Uncontrolled Handover scheme for WiMAX: infrastructure networks' by Yu-Hsiang Lin, Po-Wen Chi, Ching-Lun Lin and Wei-Chih Lin proposed an enhanced Uncontrolled Handover scheme named fast Uncontrolled Handover scheme that achieves lower handover latency for Uncontrolled Handover with fewer control messages than those of the NWG specification. The results show that our scheme outperforms the NWG 1.0.0 and NWG 1.2 in average transmission delay. In addition, our scheme is compatible with the NWG specification.

The third paper, 'An M-Taiwan experience on mobile WiMAX' by Yun-Sheng Yen, Wei-Te Hsiao, Hui-Mi Hsu and Hao-Hsien Chen shows an M-Taiwan project for mobile WiMAX and architecture of a mobile WiMAX trial in M-Yilan. In addition, they proposed a method to generate the interpolation surface for the measurement of the effective range of the mobile WiMAX coverage. The interpolation predicts values for cells in a raster, which can be used to predict unknown values for any measured point of received signal strength.

The fourth paper, 'A moving algorithm for non-uniform deployment in mobile sensor networks', by Cheng-Hung Liu, Kuo-Feng Ssu and Wei-Tong Wang had presented an automatic moving approach for the non-uniform deployment in mobile sensor networks. The mobile sensors can move to appropriate locations to prolong the system lifetime. With two refinements on MAND, not only the coverage of the network is maintained, but the lifetime can be improved enormously. The simulation results showed that EMAND had longer network lifetime than those of others, especially in the environment with high event generating rate.

The fifth paper, 'Combined circuit architecture for computing normal basis and Montgomery multiplications over $GF(2^m)$ ' by Chiou-Yng Lee, Chia-Chen Fan and Erl-Huei Lu presents design is used for any irreducible trinomial and type-II normal basis, and can be extended further for pentanomial as field polynomial of the polynomial basis representation of $GF(2^m)$. The method configurable multiplier is particularly important for cryptography implementations employing $GF(2^m)$ multipliers in constraint environments.

The sixth paper, 'A novel group authentication for RuBee sensors in wireless sensor networks' by Tin-Yu Wu, Whai-En Chen and Hung-Lin Chan shows that how integrate RuBee sensors transmit data through the sensor networks provided by WiMAX and integration AAA procedure to deal with lack problem of IPv4 IP number and the classification of every RuBee sensor by gateway access point (GAP).

The seventh paper, 'The MIH-based vertical handover method for Wi-Fi and WiMAX integrated network' by Chih-Peng Hsu presents a scheme to make vertical handover between IEEE 802.11 WLAN network and IEEE 802.16 WiMAX network based on MIH. There are two methods to support vertical handover using MIH for different scenarios. This paper can decrease system overhead caused by handover and provides session continuity for internet users.