Special Issue on Advances in Wireless Communication – I

Guest Editorial

Khan Mohammad Iftekharuddin
Department of Electrical & Computer Engineering, University of Memphis
206 Engineering Science Building, Memphis, Tennessee 38152, USA

Mohammed Nazrul Islam
Department of Security Systems, State University of New York, Farmingdale
2350 Broadhollow Road Farmingdale, New York 11735, USA

Mohammad Ataul Karim
Office of Research, Old Dominion University
4111 Monarch Way, Suite 203 Norfolk, Virginia 23508, USA

Mohammad Abdus Salam
Department of Computer Science, Southern University
Baton Rouge, Louisiana 70813, USA

Wireless communication systems and networks are becoming extremely popular because of cost effectiveness, mobility and flexibility and as such the demand for high-speed wireless communication services is growing rather rapidly. However, wireless systems do face a number of challenges including spectral efficiency, performance reliability, power requirement, QoS, security, and complexity and flexibility of the architecture. Both academia and industries are focusing on research in wireless systems and networks significantly, which motivated the publication of the current Special Issue in wireless communications.

While this Special Issue invited authors from around the world, we had also targeted pertinent papers that were presented at the IEEE International Conference on Computer and Information Technology (ICCIT 2009) held on December 2123, 2009, Dhaka, Bangladesh. We had received many submissions which were then peer-reviewed, and 15 papers were finally selected for publication to appear in issues of the journal. These authors represent academic and/or research institutions from Bangladesh, Canada, China, India, Iran, Japan, Jordan, Saudi Arabia, Thailand, and United Kingdom.

In the first paper of this Special Issue, Z. Li, J. Yang, and J. Yao propose threshold-aided opportunistic transmission strategies for use in multiuser multiple-input multiple-output downlink having limited feedback. They employ the primary threshold to reduce the feedback and the secondary threshold to guarantee the outage performance. The proposed strategies have been investigated through statistical analyses and Monte-Carlo simulation. The second paper by A. Mehbodniya, S. Aissa and J. Chitzadeh presents a vertical handoff algorithm in multitier (overlay) networks. The scheme employs pattern recognition technique using probabilistic neural network to determine the user location and decides on the handoff based on that information.

P. Wang, L. Zu, F. Liu and Y. Wang, in the third paper, develops a downlink resource allocation algorithm to maximize the system throughput employing the frequency selective fading phenomenon in orthogonal frequency division multiplexed network. Analytical and simulation results show that the algorithm enhances the system performance by assuring quality of service and guaranteeing the minimum reserved traffic rate for non-real-time services. In the fourth paper, S. Ahmed and M. Kawai present a code allocation table consisting of selected orthogonal binary user codes to reduce the peak to average power ratio in multicarrier code division multiple access systems. The authors show through analysis and simulation that the proposed scheme can perform better than Walsh-Hadamard codes in terms of both peak-to-average power ratio and bit error rate.

A scalable group key agreement is proposed next by Z. Li-Ping and W. Yi using the layer-cluster group model for a mobile ad hoc network. A multi-linear map is incorporated in the layer-cluster structure to meet the security demands of large mobile ad hoc networks as well as improve the system performance. This is followed by K. A. Darabkh who proposes a queuing model to investigate the impact of Fano decoding algorithm on the performance of a wireless network. The paper presents both analytical and simulation studies on the average number of packets residing in the system's buffer.

S. A. K. Tanoli, I. Khan and N. Rajatheva investigate next the performance of a cooperative network based on bit-interleaved coded modulation-iterative decoding over different fading channels, including Rayleigh, Nakagami-*m* and Rician. The bit error rate performance of the fading channels are evaluated and compared through simulation studies. The last paper of this Special Issue is authored by F. Haroon and K. M. Ahmed who propose the deployment of

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IEEE 802.15.4a protocol in medium access control of an industrial field level communication network. The authors also introduce a reduced complexity adaptive SRake receiver to recover the weak impulse radio-time hopping ultra wideband signals in dense multipath propagation with strong noise.

The guest editors would like to express their sincere gratitude to the reviewers, who have finished their reviews in the shortest possible time and dedicated their valuable time to ensure the quality of this special issue. Finally, the guest editors would extend their sincere appreciation to the Associate Editor-in-Chief, Dr. Haohong Wang for providing them with this opportunity and facilitating preparation of an excellent journal special issue.

Editor Biographies

Khan Mohammad Iftekharuddin is an Associate Professor in the department of Electrical and Computer Engineering at the University of Memphis (U of M). He is also an associated faculty in the Institute for Intelligent Systems at U of M. Further, he holds a joint appointment with the joint graduate program in biomedical engineering at the U of M and University of Tennessee at Memphis. Prior to joining U of M, he was on the faculty of the departments of Computer Science and Electrical & Computer Engineering at North Dakota State University. His research interests include biomedical image analysis, sensor signal acquisition and modeling, digital, optical and multimedia signal and image processing, optical computing and interconnection, applications of artificial-neural inference techniques, automatic target recognition (ATR) and biologically inspired ATR. Dr. Iftekharuddin is the author of five book chapters and more than hundred refereed journal papers and conference proceedings. He is an associate editor for *Optical Engineering*, *International Journal of Imaging*, *Open Cybernetics and Systemic Journal* and *International Journal of Tomography and Statistics*, He has served as guest editor for five journal special issues. He is an elected fellow of SPIE, a senior member of IEEE, a member of IEEE CS and OSA. He obtained his B.Sc. degree from Bangladesh Institute of Technology in 1989. He received an M.S. and a Ph.D. both in electrical engineering from the University of Dayton in 1991 and 1995, respectively.

Mohammed Nazrul Islam is an Assistant Professor in the Department of Security Systems at the State University of New York at Farmingdale. He received his BS and MS in Electrical and Electronic Engineering from Bangladesh University of Engineering and Technology in 1991 and 1994, respectively, and his PhD from Muroran Institute of Technology, Japan in 1999. Prior to joining Farmingdale, he worked as a Research Scientist and Adjunct Assistant Professor at Old Dominion University. He also served respectively as an Associate Professor at Bangladesh University of Engineering and Technology, as a Postdoctoral Research Fellow at the University of South Alabama and as a Visiting Assistant Professor at the University of West Florida. He authored and coauthored more than 110 publications in refereed journals and conference proceedings. His research interests include optical communication, wireless communication, digital image processing and solid state devices. He is a Senior Member of IEEE and a Member of SPIE.

Mohammad Ataul Karim is Vice President for Research of Old Dominion University in Norfolk, Virginia. Previously, he served as dean of engineering at the City University of New York. His research areas include information processing, pattern recognition, computing, displays, and electro-optical devices and systems. Dr. Karim is author of 16 books, 7 book chapters, and over 350 articles. He is North American Editor of *Optics & Laser Technology* and an Associate Editor of the *IEEE Transactions on Education.* He has served as guest editor for over twenty journal special issues. Professor Karim is an elected fellow of the Institution of Electrical and Electronics Engineers (IEEE), Optical Society of America (OSA), Society of Photo-Instrumentation Engineers (SPIE), the Institute of Physics (InstP), the Institution of Engineering & Technology (IET), and Bangladesh Academy of Sciences. He received his BS in physics in 1976 from the University of Dacca, Bangladesh, and MS degrees in both physics and electrical engineering, and a Ph.D. in electrical engineering from the University of Alabama respectively in 1978, 1979, and 1981.

Mohammad Abdus Salam is an Associate Professor in the Department of Computer Science at Southern University, Baton Rouge, Louisiana. He received his BS degree in Electrical and Electronics Engineering from Bangladesh Institute of Technology, Rajshahi in 1991 and MS and Ph.D. degrees from Fukui University, Japan, respectively in 1998 and 2001. Prior to 2005, he worked as an adjunct faculty member of Mathematics and Computer Science at the City University of New York at York College, and as a postdoctoral fellow in the Department of Electrical and Computer Engineering at the University of South Alabama, Mobile, Alabama. He is a member of IEEE, IEICE (Japan), and AIAA. His research interests include wireless communication, error-control coding, and sensor networks.