Special Issue on Selected Papers of the Thirteenth International Conference on Computer and Information Technology (ICCIT 2010)

Guest Editorial

Salim Zabir
Orange Labs/France Telecom R&D, Japan
Keio Shinjuku Oiwake Building 9F, 3-1-13 Shinjuku, Shinjuku-ku, Tokyo 160-0022, Japan

J. H. Abawajy
School of Engineering and Information Technology, Deakin University
Geelong, VIC, 3072, Australia

Farid Ahmed
Applied Information Sciences Department, Johns Hopkins University Applied Physics Laboratory
Laurel, MD 20723, USA

Joarder Kamruzaman
Gippslans School of IT, Faculty of IT, Monash University, Gippsland Campus
Churchill Vic 3842, Australia

Mohammad A. Karim
Office of Research, Old Dominion University
4111 Monarch Way #203, Norfolk, VA 23508, USA

Nurul I. Sarkar
School of Computing and Mathematical Science, Auckland University of Technology
Room: WY106, Private Bag 92006, Auckland 1142, New Zeland

Networking of computing devices has been going through rapid evolution and thus continuing to be an ever expanding area of importance in recent years. New technologies, protocols, services and usage patterns have contributed to the major research interests in this area of computer science. The current special issue is an effort to bring forward some of these interesting developments that are being pursued by researchers at present in different parts of the globe. Our objective is to provide the readership with some insight into the latest innovations in computer networking through this.

This Special Issue presents selected papers from the thirteenth conference of the series (ICCIT 2010) held during December 23-25, 2010 at the Ahsanullah University of Science and Technology. The first ICCIT was held in Dhaka, Bangladesh, in 1998. Since then the conference has grown to be one of the largest computer and IT related research conferences in the South Asian region, with participation of academics and researchers from many countries around the world. Starting in 2008 the proceedings of ICCIT are included in IEEExplore.

In 2010, a total of 410 full papers were submitted to the conference of which 136 were accepted after reviews conducted by an international program committee comprising 81 members from 16 countries. This was tantamount to an acceptance rate of 33%. From these 136 papers, 14 highly ranked manuscripts were invited for this Special Issue. The authors were advised to enhance their papers significantly and submit them to undergo review for suitability of inclusion into this publication. Of those, eight papers survived the review process and have been selected for inclusion in this Special Issue. The authors of these papers represent academic and/or research institutions from Australia, Bangladesh, Japan, Korea and USA. These papers address issues concerning different domains of networks namely, optical fiber communication, wireless and interconnection networks, issues related to networking hardware and software and network mobility.

The paper titled "Virtualization in Wireless Sensor Network: Challenges and Opportunities" argues in favor of bringing in different heterogeneous sensors under a common virtual framework so that the issues like flexibility, diversity, management and security can be handled practically. The authors Md. Motaharul Islam and Eui-Num Huh propose an architecture for sensor virtualization. They also present the current status and the challenges and opportunities for further research on the topic.

The manuscript "Effect of Polarization Mode Dispersion on the BER Performance of Optical CDMA" deals with impact of polarization mode dispersion on the bit error rate performance of direct sequence optical code division multiple access. The authors, Md. Jahedul Islam and Md. Rafiqul Islam present an analytical approach toward

determining the impact of different performance parameters. The authors show that the bit error rate performance improves significantly by the third order polarization mode dispersion than its first or second order counterparts.

The authors Md. Shohrab Hossain, Mohammed Atiquzzaman and William Ivancic of the paper "Cost and Efficiency Analysis of NEMO Protocol Entities" present an analytical model for estimating the cost incurred by major mobility entities of a NEMO. The authors define a new metric for cost calculation in the process. Both the newly developed metric and the analytical model are likely to be useful to network engineers in estimating the resource requirement at the key entities while designing such a network.

The article titled "A Highly Flexible LDPC Decoder using Hierarchical Quasi-Cyclic Matrix with Layered Permutation" deals with Low Density Parity Check decoders. The authors, Vikram Arkalgud Chandrasetty and Syed Mahfuzul Aziz propose a novel multi-level structured hierarchical matrix approach for generating codes of different lengths flexibly depending upon the requirement of the application.

The manuscript "Analysis of Performance Limitations in Fiber Bragg Grating Based Optical Add-Drop Multiplexer due to Crosstalk" has been contributed by M. Mahiuddin and M. S. Islam. The paper proposes a new method of handling crosstalk with a fiber Bragg grating based optical add drop multiplexer (OADM). The authors show with an analytical model that different parameters improve using their proposed OADM.

The paper "High Performance Hierarchical Torus Network Under Adverse Traffic Patterns" addresses issues related to hierarchical torus network (HTN) under adverse traffic patterns. The authors, M.M. Hafizur Rahman, Yukinori Sato, and Yasushi Inoguchi observe that dynamic communication performance of an HTN under adverse traffic conditions has not yet been addressed. The authors evaluate the performance of HTN for comparison with some other relevant networks. It is interesting to see that HTN outperforms these counterparts in terms of throughput and data transfer under adverse traffic.

The manuscript titled "Dynamic Communication Performance Enhancement in Hierarchical Torus Network by Selection Algorithm" has been contributed by M.M. Hafizur Rahman, Yukinori Sato, and Yasushi Inoguchi. The authors introduce three simple adapting routing algorithms for efficient use of physical links and virtual channels in hierarchical torus network. The authors show that their approaches yield better performance for such networks.

The final title "An Optimization Technique for Improved VoIP Performance over Wireless LAN" has been contributed by five authors, namely, Tamal Chakraborty, Atri Mukhopadhyay, Suman Bhunia, Iti Saha Misra and Salil K. Sanyal. The authors propose an optimization technique for configuring the parameters of the access points. In addition, they come up with an optimization mechanism in order to tune the threshold of active queue management system appropriately. Put together, the mechanisms improve the VoIP performance significantly under congestion.

Finally, the Guest Editors would like to express their sincere gratitude to the 15 reviewers besides the guest editors themselves (Khalid M. Awan, Mukaddim Pathan, Ben Townsend, Morshed Chowdhury, Iftekhar Ahmad, Gour Karmakar, Shivali Goel, Hairulnizam Mahdin, Abdullah A Yusuf, Kashif Sattar, A.K.M. Azad, F. Rahman, Bahman Javadi, Abdelrahman Desoky, Lenin Mehedy) from several countries (Australia, Bangladesh, Japan, Pakistan, UK and USA) who have given immensely to this process. They have responded to the Guest Editors in the shortest possible time and dedicated their valuable time to ensure that the Special Issue contains high-quality papers with significant novelty and contributions.

Editor Biographies

Salim Zabir is leading research and development on machine to machine (M2M) and e-health, wellness and disabilities at Orange Labs/France Telecom, Japan. He had his PhD and an MS in information science from Tohoku University, Japan. Before that, he obtained his MSc Engineering and BSc Engineering degrees in Computer Science and Engineering from Bangladesh University of Engineering and Technology. Prior to his current appointment, he has served at Tohoku University, Japan, Kyushu University, Japan, Kyung Hee University, Korea and Bangladesh University of Engineering and Technology. He also worked with Panasonic R&D headquarters in Osaka, Japan. His research interests include computer networks, networking protocols, performance evaluations, ubiquitous computing, applications of ICT for development etc. Dr. Zabir has been serving in the program/technical committees of various international conferences and is guest editing special issues of scholarly journals. He is a member of the IEEE and BCS.

Jemal H. Abawajy is an associate professor, Deakin University, Australia. Dr. Abawajy is the director of the "Pervasive Computing & Networks" research groups at Deakin University and a senior member of IEEE. Dr. Abawajy is actively involved in funded research in robust, secure and reliable resource management for pervasive computing and networks. He has published more than 200 research articles in refereed international conferences and journals as well as a number of technical reports. Dr. Abawajy has given keynote/invited talks at many conferences. Dr. Abawajy has guest-edited several international journals and served as an associate editor of international conference proceedings. In addition, he is on the editorial board of several international journals. Dr. Abawajy has been a member of the organizing committee for over 150 international conferences serving in various capacity including chair, general co-chair, vice-chair, best paper award chair, publication chair, session chair and program committee. He is also a frequent reviewer for international research journals (e.g., FGCS, TPDS and JPDC), research grant agencies, and PhD examinations.
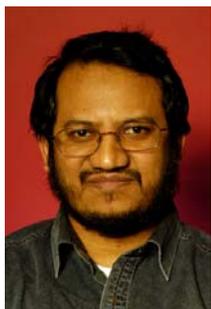
Farid Ahmed is currently with the Applied Information Sciences Department at Johns Hopkins University Applied Physics Laboratory at Laurel, MD. Prior to this position, he had been associate professor of electrical engineering and computer science at the Catholic University of America, Washington, DC. Dr. Ahmed's professional background includes signal/image processing, computer networks, information security, digital watermarking, cryptography, and optical information processing. He has a publication record of over fifty peer-reviewed journal articles and conference papers combined in these areas and holds 5 US patents. Dr. Ahmed is an associate editor of the EURASIP Journal of Wireless Communications and Networking. He has also been serving on the technical program committee of SPIE conference, ICISST, IFIP N2S, IEEE NAECON, and ICCIT etc. Dr. Ahmed is a member of SPIE and Computer Security Institute, and a senior member of IEEE.

Joarder Kamruzzaman received a B.Sc. and M.Sc. in electrical engineering from Bangladesh University of Engineering & Technology, Dhaka, Bangladesh in 1986 and 1989 respectively, and a PhD in information system engineering from Muroran Institute of Technology, Japan, in 1993. Currently, he is a faculty member in the Faculty of Information Technology, Monash University, Australia. His research interest includes computer networks, computational intelligence, and bioinformatics. He has published over 125 peer-reviewed publications which include 35 journal papers and 5 book chapters, and edited two reference books on computational intelligence theory and applications. He is currently serving as a program committee member of a number of international conferences.

Mohammad Ataul Karim is Vice President for Research of Old Dominion University in Norfolk, Virginia. His research areas include information processing, pattern recognition, computing, displays, and electro-optical devices and systems. Dr. Karim is author of 18 books, 7 book chapters, and over 370 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-five 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.

Nurul I. Sarkar is currently a Senior Lecturer in the School of Computing and Mathematical Sciences at Auckland University of Technology, New Zealand. He holds a PhD in Electrical and Electronic Engineering from the University of Auckland and his current research interests include wireless communication networks, cross-layer design optimization, and network security. His first edited book entitled Tools for Teaching Computer Networking and Hardware Concepts has been published by IGI Global Publishing in 2006. Dr Sarkar is the author of more than 85 refereed journal and conference papers. He currently serves on editorial boards on several international journals and a guest editor for AP Journal of Networks. He served as an associate technical editor for the IEEE Communications Magazine, TPC co-chair for mobile and wireless networking track (IEEE TENCON'10 and ATNAC'10), and elected chairman of the IEEE New Zealand Communications Society Chapter. Dr Sarkar serves as TPC member for various leading networking conferences as well as track and session chairs for several national and international forums. Dr Sarkar is a Senior Member of IEEE.