Editorial

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Biographical notes: Mohammad S. Obaidat is an internationally known academic/researcher/scientist. He received his PhD in Computer Engineering from Ohio State University, USA. He is currently a full Professor of Computer Science and Software Engineering at Monmouth University. Among his previous positions are Chair of the Computer Science Department and Director of Graduate Program at MU. He has received extensive research funding and authored/co-authored seven books and over 420 refereed scholarly journal and conference articles. He has served as a Consultant for several corporations worldwide and is Editor of many scholarly journals including being Editor-in-Chief of the *Wiley International Journal of Communication Systems* and Editor of *IEEE Wireless Communications*. He is the President of the Society for Modeling & Simulation International, SCS. He was awarded the distinguished Nokia Research Fellowship and the Distinguished Fulbright Award. In 2009, he received the SCS prestigious McLeod Founder's Award in recognition of his outstanding technical and professional contributions to modeling and simulation. He is a Fellow of SCS and a Fellow of IEEE.

Welcome to this special issue of the *International Journal of Communication Networks and Distributed Systems* (*IJCNDS*) on 'Performance evaluation of computer and communication systems'. The papers included in this special issue are based mainly on selected extended versions of best papers accepted in the 2008 International Symposium on Performance Evaluation of Computer and Telecommunication Systems, SPECTS 2008. We only accepted six papers in this special issue. This means that these accepted papers have undergone a thorough and a critical review process by experts in the field.

Antichi, Pietro, Ficara, Giordano, Procissi and Vitucci presented BRUte on Network processor (BRUNO), a traffic generator built on the IXP2400 Intel Network Processor and based on a modified BRUTE version. BRUTE is designed to run on the PC hosting the NP-card and is in charge of computing departure times according to given traffic models. Then, the host PC writes such information in the memory shared with the packet processing units of NP, which, in turn, use these data to generate packets and send them with the right timeliness. The motivation is a smart distribution of tasks according to capabilities and practicality. The overall application has shown a sustainable rate of 1 Gbps and a great accuracy in models reproduction. The experimental results have shown the goodness of the proposed architecture and the usefulness of the time correction mechanism.

Qazi and Elmirghani presented a MAC protocol, M-PRMA, for multimedia traffic while maintaining the QoS by introducing a multi-class scheduler. Furthermore, orthogonal codes have been introduced to avoid collisions during the reservation phase. A packet-level video traffic generator is proposed along with voice traffic modelling.

Moreover, a vehicular simulator has been employed to evaluate some useful communication scenarios by integrating the M-PRMA protocol and the results have been compared with the original PRMA protocol.

Abascal, Lafuente, Marco, Falcó, Casas, Sevillano, Cascado, and Luján described the multilayered architecture used in the AmbienNet project, focusing on the elements needed for navigation assistance. The integration of a number of different technologies and the nature and constraints of this kind of application involve a hierarchical representation and the processing of context information. To illustrate this, the two applications developed to assist people in indoor navigation use the information provided by the context-awareness and localisation service.

Padmanabh and Roy presented a strategy of the placement of the sensor nodes in such a way that inter-nodal distance is less near BS and it is more for peripheral nodes. Thus the nodes around BS will have to transmit to lesser distance and there will be saving of transmission energy which will help these nodes to compensate the additional communication load imposed on these nodes. In addition they proposed to place redundant nodes so that with increasing density of nodes towards the base station, these nodes take care of extra communication loads imposed on them. The authors proved analytically that if the proposed intelligent strategy of nodes placement is used, the phenomenon of bottleneck can be avoided. They conducted simulation analysis to validate the theoretical basis.

Sierra, Caro, Marzo, Fabregat, Solano and Donoso proposed a heuristic scheme called dynamic S/G which takes into account the S/G light-tree architecture and has the goal of reducing the blocking probability. Grooming policies for the S/G light-tree were presented in order to establish when grooming can be performed. The results showed that independent of the number of nodes and physical topology, with S/G light-tree, the blocking probability supplied by the light-tree can be substantially improved. The number of splitter and amplifier banks (SAB) is an important factor in the aforementioned architectures because they substantially affect the blocking probability in WDM networks with multicast traffic support.

Finally, Ould-Khaoua, Abduali, Mackenzie and Mohammed proposed a new probabilistic route discovery approach for routing in MANETs, referred to here as dynamic probabilistic route discovery (DPR), where the forwarding probability at a node is dynamically computed based on its neighbour's density and the number of its neighbours covered by the broadcast. The paper has compared the performance of DPR against those of self pruning, simple flooding, and fixed probability based route discovery by incorporating them into modified versions of the traditional AODV implementation in NS-2. Obtained analysis results revealed that equipping a routing protocol with the proposed probabilistic route discovery can result in a significant reduction of routing control overhead while achieving good throughput.

I would like to thank all the authors and reviewers for their contributions and devoted efforts. A special thank goes the technical program committee of SPECTS 2008 for their valuable time and superior work. Thanks are also due to the editorial assistants for their fine support. Finally, special thanks go to the Editors-in-Chief of *IJCNDS*, Prof. Sudip Misra and Prof. Isaac Woungang, for hosting this special issue. I hope that the work reported here will motivate further research and development efforts in the performance evaluation of computer and telecommunication field.