# Preface

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**Biographical notes:** Douglas J. Holzhauer received his PhD from the University of Massachusetts and has been a researcher at the Air Force Research Laboratory for 30 years. He is an Adjunct Professor at SUNY Institute of Technology. Past research topics have included finite element analysis and distributed information systems. Current research is in the area of applying artificial intelligence to sensor networks.

Nael Abu-Ghazaleh is an Associate Professor in the Computer Science Department at the State University of New York in Binghamton. He received his PhD and MS Degrees in Computer Engineering from the University of Cincinnati in 1997 and 1994 respectively, and his Bachelor's Degree in Electrical Engineering from the University of Jordan. His research areas are in mobile networking, sensor networks and parallel computing.

Jingyuan Zhang received the PhD Degree in Computer Science from Old Dominion University in 1992. Since 1999, he has been with the Department of Computer Science at the University of Alabama, where he is currently an Associate Professor. Prior to joining the University of Alabama, he was an Instructor with Ningbo University, an Assistant Professor with Elizabeth City State University, and a Principal Computer Scientist with ECI Systems and Engineering. His current research interests include wireless networks and mobile computing, single display groupware, graphics, and parallel computing. He is a member of the IEEE.

Mobile and wireless networks have experienced an explosive growth during the last few years. In fact, mobile and wireless networking is gradually emerging as a discipline. It has impacted the way medical, military, industrial, commercial and societal systems communicate and cooperate. This special issue of the *International Journal of High Performance Computing and Networking* addresses several research areas particular to mobile and wireless networking. It is not intended to be an in-depth examination of any of the many topics of interest associated with mobile and wireless networks but to offer the reader an overview of the several areas that comprise the technologies whose advancement will extend the use of wireless networks. In the original workshop (2004 International Workshop on Mobile and Wireless Networking), held during the summer of 2004 in Montreal, Canada, the call for papers specifically included an expansive listing of topics of interest, to allow access to the wide variety of research

being accomplished. Of the 40 papers submitted to the workshop, these eight were chosen to be extended for publication based on their technical quality and the applicability of the research to the advancement of the discipline. The international character of this journal is also indicative of the importance of mobile and wireless technology. The papers document research being accomplished by researchers in Asia, Europe and North America.

The selected papers report on research topics spanning cellular networks, ad hoc networks and a new hybrid network that combines an ad hoc with an infrastructure network. Some of the research topics, i.e., Quality of Service (QoS), performance enhancement and routing protocols, are essential to the operation of all wireless networks. These topics have been applied to real time information systems that are typical of a wireless mobile network. Researchers have also been cognizant of legacy

software that is part of the network and have addressed the impact of integration with MAC layers or routing protocols. The importance of the other topics: network security, power savings and ad hoc/Wireless Local Area Network (WLAN) interfacing, vary with the specific application. In each of these cases, the researchers have selected an application that is appropriate to address their technical topic.

In the research presented here, extensive use was made of simulations to do parametric studies. Simulation is by its nature very supportive of evaluation or validation, especially for multivariate systems or where the scalability of a process is in question. From the papers one can see how difficult it is to assess complex systems. Equally apparent is simulation's ability to cut through the complexity and enable conclusions to be made. In one paper, the authors were able to compare different routing protocols both by running performance tests using actual systems and then comparing the results with simulations. Many possibilities for future research are suggested by the papers in this journal. One that presents itself as most necessary is the development of a scenario based performance evaluation process that could effectively allow for optimisation where compromise between multiple design tradeoffs is a fact of life and where application effects can dominate.

Finally, the editors would like to thank all the people involved in the original workshop and this special issue, including the organisers, reviewers and contributors.