Preface

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Biographical notes: Sudip Misra is a Visiting Fellow in the Department of Computer Science at Yale University, in New Haven, Connecticut, USA, and an Adjunct Professor at Ryerson University. He received his PhD Degree in Computer Science from Carleton University, in Ottawa, Canada, and the Masters and Bachelors Degrees respectively from the University of New Brunswick, in Fredericton, Canada, and the Indian Institute of Technology, in Kharagpur, India. His current research interests include algorithm design and engineering for telecommunication networks, software engineering for telecommunication applications, and computational intelligence and soft computing applications in telecommunications.

Wireless communication technologies are undergoing rapid advancements. The last few years have experienced a steep growth in research in the areas of *ad hoc* networks and ubiquitous computing systems. Even though these areas hold great promises for our future, there are several challenges that need to be addressed. To address this need, the *2006 International Symposium on Ad Hoc and Ubiquitous Computing* (*ISAHUC'06*) was organised for the first time in 2006 in Mangalore, Karnataka, India. It was co-organised with the *14th International Conference on Advanced Computing and Communications* (*ADCOM 2006*), which is a well established conference by itself, taking place annually in different parts of India.

The authors of some of the outstanding papers from ISAHUC'06 were invited to submit their contributions for consideration of publication in the *International Journal of Ad Hoc and Ubiquitous Computing* (*IJAHUC*). Three of the submissions were accepted for publication in the current issue of IJAHUC.

The first of these papers is entitled 'Highly stable and adaptive clustering with efficient routing in wireless ad hoc networks', and is authored by S.K. Dhurandher and G.V. Singh. Dhurandher and Singh proposed a clustering algorithm basing on criteria such as transmission power, transmission rate, mobility, battery power and cluster forming ability of a node (measured in terms of the degree of the node to form clusters). They have claimed that their algorithm leads to a strong network stability and is adaptive with the topology changes of the network. They have demonstrated with the help of simulations that their algorithm performs better that those of some of the previously proposed ones with respect to performance metrics such as the number of clusters formed, number of clusterhead changes, and the number of reaffiliations.

The second paper is by R. Chandrasekar and S. Misra, and is entitled, 'Using zonal agent distribution effectively for routing in Mobile Ad Hoc Networks'. They proposed an ant-based routing protocol for Mobile Ad Hoc Networks (MANETs) utilising zonal distribution of ant-like agents. In their algorithm they have considered a mean weighted power factor unique to each zone for bounding the routing zones. They have considered two routing tables – a Transaction Routing Table which keeps track of inter-zonal routing information characterised by communication between the corresponding ants at the periphery – and a Master Routing Table which keeps track of the shortest paths calculated from the Transaction Routing Table for a source-destination pair. Their idea is to sometimes enable preferring longer paths having less traffic instead of shorter congested paths, especially in case of link failures. They considered the Gauss-Markov mobility model, and with the help of simulations they have shown that their proposed protocol performs better than the state-of-the-art routing protocols. This is particularly true in large and dynamic environments. They have shown that their algorithm is robust in cases of link failures and highly congested paths.

The third paper is entitled, 'Energy efficient Robust On-Demand Multicast Routing Protocol for MANETs', and is authored by R. Manoharan, P. Thambidurai and S. Lakshmana Pandian. They proposed an on-demand multicast routing protocol which is robust in the sense that it increases the lifetime of the multicast session while increasing the overall throughput of the network. The authors mentioned that in the previous multicast routing protocols, the multicast group leader changes when the battery power of the existing group leader exhausts leading to packet loss. The authors claim to overcome these shortcomings. The authors have demonstrated that their proposed algorithm performs better than the existing popular protocol – the Multicast Ad hoc On-Demand Distance Vector (MAODV), with respect to the energy consumed, the ratio of packets delivered to those not delivered, and the control overhead. They have also shown that their proposed protocol maximises throughput and increases the lifetime of the multicast sessions.

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