Editorial
Wireless Mobile Ad Hoc Networks

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Wireless mobile ad hoc networks (MANETs), due to their dynamic nature and due to the unreliability of the wireless medium, pose unique challenges that are significantly more complex than those that arise in traditional wired or even cellular wireless networks. MANETs must self organize into a multihop peer-to-peer network without centralized control and without the help of base stations. Their topologies are unpredictable due to mobility and due to fading, shadowing, and other wireless channel impairments. The number and distribution of active nodes in the network are constantly changing, thereby creating additional variability in the network connectivity. Power and energy constraints, interference, and the shared nature of the wireless medium require adaptive relaying mechanisms and channel access. In such a harsh environment, robustness and quality of service (QoS) are essential. MANETs usually consist of a heterogeneous mixture of nodes with a variety of traffic types and different QoS requirements. Scaling laws for these networks are not fully understood. Diverse tradeoff studies related to capacity, delay, bandwidth, and energy consumption are currently under intense investigation. This special issue, which adds one more collection of contributions to the vibrant field of ad hoc networking, includes 6 papers that address some of these issues.

The first paper by S. Xu et al. investigates the reliability of communications paths in mobile ad hoc networks. They demonstrate an analysis framework for some mobility metrics such as link persistence, link duration, link availability, link residual time, and so forth. The second paper by D. Noh and H. Shin introduces an efficient way to handle service advertisement and discovery in MANETs so as to avoid redundant flooding and to lower overhead. The third paper by M. D. Colagrosso investigates the use of machine learning to facilitate adaptive intelligent broadcasting protocols in MANETs. The forth paper by C. Comaniciu and H. V. Poor introduces a cross-layer design that increases energy efficiency in MANETs through joint optimization of transmit power and routing selection. The fifth paper by L. Qian et al. develops a joint power control and routing algorithm for CDMA in wireless ad hoc networks. The sixth and last paper by E. Perevelov et al. studies scaling laws for ad hoc networks taking into account the overhead in route discovery algorithm.

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