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*Editorial*

# Mathematical and Numerical Modeling of Information Dissemination in Mobile Networks

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This special issue covers a number of developing topics in mathematical and numerical modeling of information dissemination in mobile networks. The 15 research articles included in this special issue present original research outcomes and future evolutions of mathematics in mobility and networking. From communication mechanisms to mobile applications, the topics of this special issue are classified into three categories, namely, complex models, techniques, and applications.

The first group of papers addresses issues in the area of information dissemination via mathematical modelling approaches. In the paper of "*Efficient periodic broadcasting for mobile networks at small client receiving bandwidth and buffering space*," H.-F. Yu et al. introduced a new Fibonacci-broadcasting scheme (called FiB+) for video broadcasting and achieved smaller client buffering space than that of FiB under two-channel receiving bandwidth. In the paper entitled "*Single-channel data broadcasting under small waiting latency*," H.-F. Yu proposes a single-channel broadcasting scheme for video-on-demand services. By partitioning a video into equal-sized segments, these classified segments have been transferred over a single channel according to a predefined arrangement to yield short waiting time of data broadcasting. In the paper "*A mutual-evaluation genetic algorithm for numerical and routing optimization*," C.-H. Lin and J.-D. He present a mutual-evaluation genetic algorithm (MEGA) to find optimal flow-allocation strategies for multipath-routing problems. In the paper entitled "*Minimum-cost QoS-constrained deployment and routing policies for wireless relay networks*," F.-Y.-S. Lin et al. use Lagrangian relaxation (LR) method to minimize the development cost of wireless relay networks. In the paper entitled "*A rough penalty genetic algorithm for multicast routing in mobile ad hoc networks*," C.-H. Lin and C.-C. Chuang formulated the multicast routing problem in mobile ad hoc networks, where the objective function is to minimize the total cost of the multicast tree subject to QoS constraints. The aforementioned constrained optimization problems are solved by a proposed rough penalty genetic algorithm and achieve near-optimal solutions for a variety of multicast routing problems.

The second group concerns networking techniques and system design, such as optimal methods for the resource management and localization estimation. In the paper entitled "*Interference control for cognitive network with high mobility*," Y. Li et al. aim at maximizing the capacity of the secondary system with the interference constraints via a water-filling style method. The paper entitled "*Modeling and performance analysis of route-over and mesh-under routing schemes in 6LoWPAN under error-prone channel condition*" by T.-H. Lee et al. develops a Markov chain model to analyze the performance of two routing schemes in 6LoWPAN. In "*A multistage control mechanism for group-based machine-type communications in an LTE system*," W.-C. Hung et al. used a Markov chain with $M/G/k/k$ to analyze machine-type communications in an LTE network and proposed a multistage-control (MSC) mechanism to allocate LTE bandwidth effectively. In the paper entitled "*Calculation of weighted geometric dilution of precision*," C.-S. Chen et al. intelligently select measurement units for improving location accuracy in the proposed wireless positioning systems. In the paper entitled