CALL FOR PAPERS

Special Issue of Queueing Systems on

Recent Trends in the Mathematics of Wireless Communication Networks: Algorithms, Models and Methods

BACKGROUND

Wireless communication systems have experienced a spectacular expansion, and today provide the predominant means of accessing the Internet. The capacity of these systems is constrained by a set of scarce resources such as radio frequencies, transmit power and time slots. Information theory offers a powerful mathematical framework to understand how these transmission resources must be allocated so as to maximize the capacity at the physical layer, yielding valuable insights for the design of efficient schemes for e.g. modulation, coding and power control. Typically, however, information-theoretic models pertain to idealized scenarios: they do not account for random behavior and dynamics at higher network layers; the practical application-specific performance requirements are largely ignored; and algorithmic implementation constraints are usually not considered.

Designing systems while systematically addressing all of these aspects has posed a major challenge over the past few decades. In recent years, the need for wireless networks with significantly better performance has rejuvenated research activities towards tackling these challenges. The purpose of the special issue is to gather recent advances in the mathematical treatment and stochastic analysis of wireless communication systems.

SCOPE

We solicit contributions advancing the mathematical treatment and stochastic analysis of wireless communication systems, such as cellular networks, multihop wireless local area networks (WLANs), wireless mesh and ad-hoc networks, as well as cognitive radio systems. Specific topics of interest include but are not limited to:

- Impact of user mobility and fading
- Flow-level performance analysis
- Scheduling, resource sharing and load balancing algorithms for cellular systems
- Distributed resource management in WLANs, mesh and ad-hoc networks (throughput and utility optimal schemes)
- Energy-efficient resource management schemes
- Interference management
- Information theory with queues
- Spatial queueing models
- Multi-channel wireless systems (spectrum exploration and exploitation)
- Scaling laws
SUBMISSION
Queueing Systems solicits original contributions and surveys on the above-described topics for possible publication in a special issue. Manuscripts may be submitted through the Editorial Manager system at http://www.editorialmanager.com/ques/
For consideration for the special issue, please select “SI: Wireless Communication Networks” from the drop-down menu at the time of submission.
The usual manuscript preparation and copyright transfer guidelines for Queueing Systems apply. All submissions will undergo review for technical merit, significance, and exposition quality. As is customary for such special issues, authors of submitted papers will play a key role in the review process.
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