Network optimization for wireless microwave backhaul

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Abstract:
Unlike wired networks, the capacity of a microwave link is prone to variations, either due to external factors (e.g., weather) or by the action of the network operator (e.g., modulation). This fundamental difference raises a variety of new issues to be addressed. In this talk, we investigate optimization problems related to the design and configuration of wireless microwave backhaul networks. We are concerned with a general class of problems expressed in terms of minimum cost multicommodity flows with discontinuous step increasing cost functions on the links of the network. These problems are among the most important and challenging problems in network optimization. We introduce mathematical models for some of these problems and present solution approaches essentially based on general mixed integer programming, chance-constrained programming, relaxation techniques, cutting plane methods, as well as hybrid metaheuristics.