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Resource allocation in wireless networks in the presence of flow-level dynamics

Abstract:
My Ph.D. research is focused on the resource allocation problem in wireless networks in the presence of flow-level dynamics. The resource allocation problem is a key problem in wireless networks due to limited bandwidth and extensive noises and interferences. I first investigated the scheduling problem in wireless cellular networks, and developed throughput-optimal scheduling algorithms, for single-channel systems and multi-channel systems respectively. Then, I investigated the joint congestion control and scheduling problem in wireless peer-to-peer networks, and an optimal architecture was proposed which can maximize user utilities while satisfying the delay constraints of packets. At last, I looked at the scheduling problem in multi-hop wireless networks with fixed routing, and developed a scheduling algorithm which is proved to be optimal and has superior performance than previous algorithms.