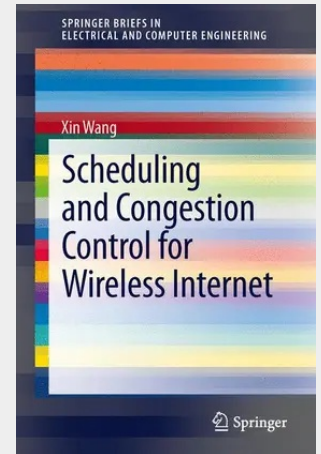


Scheduling and Congestion Control for Wireless Internet

This brief proposes that the keys to internet cross-layer optimization are the development of non-standard implicit primal-dual solvers for underlying optimization problems, and design of jointly optimal network protocols as decomposition of such solvers. Relying on this novel design-space oriented approach, the author develops joint TCP congestion control and wireless-link scheduling schemes for wireless applications over Internet with centralized and distributed (multi-hop) wireless links. Different from the existing solutions, the proposed schemes can be asynchronously implemented without message passing among network nodes; thus they are readily deployed with current infrastructure. Moreover, global convergence/stability of the proposed schemes to optimal equilibrium is established using the Lyapunov method in the network fluid model. Simulation results are provided to evaluate the proposed schemes in practical networks.

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