

Efficient Nonlinear Optimization of Queueing Systems

M. Chiang, A. Sutivong, and S. Boyd

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- [nonlin_opt_queue.pdf](#)

We present a systematic treatment of efficient nonlinear optimization of queueing systems. The suite of formulations uses the computational tool of convex optimization, with fast polynomial time algorithms to obtain the global optimum for these nonlinear problems under various constraints. We first show convexity structures of several queueing systems, including some surprising transition patterns, followed by formulating and showing numerical examples of several convex performance optimizations for both single queues and queueing networks. Blocking probability minimization and service rate allocation through the effective bandwidth approach is also presented.

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