

Industrial and Systems Engineering Seminar

Asymptotically Optimal Control for a Stochastic Network using Solution of a Free Boundary Problem

Wednesday, November 18

3:15 PM – Refreshments before the Seminar

3:30 PM – Graduate Seminar



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An asymptotic framework for optimal control of multiclass stochastic processing networks, using formal diffusion approximations under suitable temporal and spatial scaling, by Brownian control problems (BCP) and their equivalent workload formulations (EWF), has been developed by Harrison (1988). We consider a stochastic network for which the associated EWF does not have a simple form explicit solution, however by considering an associated free boundary problem one can give a representation for an optimal controlled process as a two dimensional reflected Brownian motion in a Lipschitz domain whose boundary is determined by the solution of the free boundary problem. Using the form of the optimal solution we propose a sequence of control policies, given in terms of suitable thresholds, for the scaled stochastic network control problems and prove that this sequence of policies is asymptotically optimal. Joint work with Xin Liu and Subhamay Saha.

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