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Simulation Optimization of Reflected Diffusion Processes

Monday, June 17, 2024 4:00 PM (30 minutes)

Recent work by Ata, Harrison and Si (2023) introduced a simulation-based computational method for stochastic optimal drift control of multidimensional reflected Brownian motion (RBM). The main objective of their work is to compute an optimal "closed loop"stationary Markov control policy. In this talk, I will present our recent results on computing optimal "open loop"controls for finite horizon control of reflected diffusion processes. Our methodology is also simulation-based, but the unique structure of open loop control problems allows us to pose the control problem as a stochastic optimization problem with an infinite dimensional feasible set. Our main results are rates of convergence and consistency results for the estimated control function. Time permitting, I will also discuss connections and implications of our methodology for training neural ordinary differential equation (NODE) models in deep learning. This is joint work with Zihe Zhou and Raghu Pasupathy at Purdue University.

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