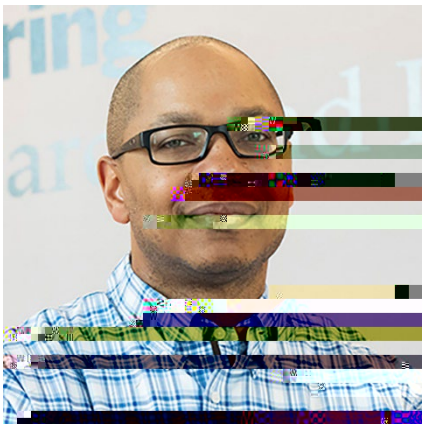
SMU Lyle School of Engineering

Operations Research and Econometrics Seminar Series

Research Seminar

Power and Scheduling in a Parallel Processing Network



Dr. Mark E. Lewis
Maxwell M. Upson Professor of Engineering
Cornell University

Friday, April 8, 2022
11:00 a.m. – 12:15 p.m.
https://smu.zoom.us/j/97906267193

Abstract
We consider a parallel processing network with removable servers. Beginning with the single server model with power and service rate control, we study the importance of a delayed restart when the server is off. In particular, we show that an optimal policy exists (under the average cost criterion) that delays restarting until a "safety stock" of work is in the system. It then behaves similarly to that of the classic service rate control models. With that as the backdrop, we consider scheduling with the ability to remove servers. We introduce "delay-JSQ" (join the shortest queue) policies, show their stability and asymptotic optimality in the two-server case, and conclude with a detailed numerical study that shows they outperform JSQ by up to 80%.