University of California, Irvine
Statistics Seminar

A Quantum Parallel Markov Chain Monte Carlo

Andrew Holbrook
Assistant Professor
Department of Biostatistics
UCLA

4 p.m., Thursday, April 28, 2022
6011 Donald Bren Hall

I propose a novel quantum computing strategy for parallel MCMC algorithms that generate multiple proposals at each step. This strategy makes parallel MCMC amenable to quantum parallelization by using the Gumbel-max trick to turn the generalized accept-reject step into a discrete optimization problem. This allows me to embed target density evaluations within a well-known extension of Grover's quantum search algorithm. Letting P denote the number of proposals in a single MCMC iteration, the combined strategy reduces the number of target evaluations required from O(P) to O(P^{1/2}).