

ACMS Statistics Seminar

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154 Hurley Hall
4:00 – 5:00 PM



Simple, Scalable and Accurate Posterior Interval Estimation

Standard posterior sampling algorithms, such as Markov chain Monte Carlo, face major challenges in scaling up to massive datasets. We propose a simple and general posterior interval estimation algorithm to rapidly and accurately estimate quantiles of the posterior distributions for one-dimensional functionals. Our algorithm runs Markov chain Monte Carlo in parallel for subsets of the data, and then averages quantiles estimated from each subset. We provide strong theoretical guarantees and show that the credible intervals from our algorithm asymptotically approximate those from the full posterior in the leading parametric order. Our theory also accounts for the Monte Carlo errors from posterior sampling. We compare the empirical performance of our algorithm with several competing embarrassingly parallel MCMC algorithms in both simulations and a real data example. We also discuss possible extensions to multivariate posterior credible regions.

The Department of Applied and Computational
Mathematics and Statistics

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