On Locally Optimal Markov Chain Monte Carlo Sampling

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Based on the optimal transition matrix that minimizes the asymptotic variance, we applied the transition to a local update scheme and developed a powerful new Markov chain Monte Carlo algorithm: Locally Optimal Sampler (LOS). In our experiments, LOS substantially improved the rate of convergence compared to the Metropolis-Hastings and Gibbs Sampler. This improvement only requires minor modifications in existing Gibbs sampling code.