Automatically Tuned General-Purpose MCMC via New Adaptive Diagnostics

Adaptive MCMC is an attempt to modify a Markov chain “on the fly” so the chain can converge quicker. As many adaptive techniques involve using information from the past iterations of the Markov chain, the chain loses its Markovian property. The algorithm introduced here employs a few adaptive rules to tune a symmetric random walk Metropolis algorithm. The adaption stops once the algorithm diagnoses that further adaption is unnecessary. This choice avoids the theoretical difficulties which arise in proving the convergence of chains which adapt infinitely. Once the chain stops adapting, the algorithm runs a standard non-adaptive MCMC.