Efficient Bernoulli factory MCMC for intractable likelihoods

Dootika Vats

Indian Institute of Technology
E-mail: dootika@iitk.ac.in

Abstract: Accept-reject based Markov chain Monte Carlo (MCMC) algorithms have traditionally been a function of the ratio of the target density at the two contested points. We note that this feature is rendered almost useless in Bayesian MCMC problems with intractable likelihoods. We introduce a new acceptance probability that has the distinguishing feature of not being a function of the ratio of the target density at two points. We show that such a structure allows for the construction of an efficient and stable Bernoulli factory. The resulting Portkey Barker's algorithm is exact and computationally more efficient that the current state-of-the-art.