

The new BFFs in MCMC: Barker and Bernoulli

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Abstract

The Metropolis-Hastings acceptance function is undoubtedly the most popular acceptance rule in Markov chain Monte Carlo (MCMC). However, when this acceptance rule is impossible to evaluate, the Barker's acceptance function can be particularly useful when used with Bernoulli factories. I will describe a new portkey acceptance function that is quite similar to the Barker's acceptance function, but leads to a dramatically more robust Bernoulli factory implementation. I will present an application to a Bayesian correlation estimation model. A practical challenge here is in tuning the proposal distribution for the (almost) Barker's acceptance rule. To address this, I present optimal scaling results for Barker's rule and hope to encourage the audience to strive for future optimal scaling results for a wide class of acceptances.

The work is joint with Sanket Agrawal, Flávio Gonçalves, Krzysztof Łatuszyński, Gareth Roberts.