



Consistency of Markov chain quasi-Monte Carlo on continuous state spaces

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The random numbers driving Markov chain Monte Carlo (MCMC) simulation are usually modeled as independent $U(0,1)$ random variables. Tribble [Markov chain Monte Carlo algorithms using completely uniformly distributed driving sequences (2007) Stanford Univ.] reports substantial improvements when those random numbers are replaced by carefully balanced inputs from completely uniformly distributed sequences. The previous theoretical justification for using anything other than i.i.d. $U(0,1)$ points shows consistency for estimated means, but only applies for discrete stationary distributions. We extend those results to some MCMC algorithms for continuous stationary distributions. The main motivation is the search for quasi-Monte Carlo versions of MCMC. As a side benefit, the results also establish consistency for the usual method of using pseudo-random numbers in place of random ones.

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