

BAYESIAN NUMERICAL INFERENCE FOR HIDDEN MARKOV MODELS

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Abstract. In many situations it is important to be able to propose N independent realizations of a given distribution law. We propose a strategy for making N parallel Monte Carlo Markov Chains (MCMC) interact in order to get an approximation of an independent N -sample of a given target law. In this method each individual chain proposes candidates for all other chains. We prove that the set of interacting chains is itself a MCMC method for the product of N target measures. Compared to independent parallel chains this method is more time consuming, but we show through examples that it possesses many advantages. This approach is applied to a biomass evolution model.

Keywords: Markov chain Monte Carlo method, interacting chains, hidden Markov model