



THE UNIVERSITY OF  
CHICAGO

Department of Statistics

DISSERTATION PROPOSAL

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Bayesian Inference via Sampling

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#### ABSTRACT

Bayesian model is a natural way of incorporating prior information about parameters, and it yields good statistical performance in theory. In order to infer posterior distributions, it is ubiquitous to adopt sampling techniques, but little work has been done on the computational efficiency of sampling. We consider a simple Metropolis-Hastings algorithm for Bayesian community detection, first establish a posterior strong consistency result under the optimal signal-to-noise ratio in the literature, and then give a set of conditions that guarantee rapid mixing of the Markov chain. The mixing time analysis is based on a careful study of posterior ratios and a canonical path argument to control the spectral gap of the Markov chain. Finally, we will talk about some ongoing work of sampling from Bayesian GAN via approximate Bayesian computation.