

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Metropolis-Hastings via Classification

Tuesday, February 1, 2022
10:20 AM - 11:10 AM [Eastern Time](#)
Zoom

Abstract

This paper develops a Bayesian computational platform at the interface between posterior sampling and optimization in models whose marginal likelihoods are difficult to evaluate. Inspired by contrastive learning and Generative Adversarial Networks (GAN), we reframe the likelihood function estimation problem as a classification problem. Pitting a Generator, who simulates fake data, against a Classifier, who tries to distinguish them from the real data, one obtains likelihood (ratio) estimators which can be plugged into the Metropolis-Hastings algorithm. The resulting Markov chains generate, at a steady state, samples from an approximate posterior whose asymptotic properties we characterize. Drawing upon connections with empirical Bayes and Bayesian mis-specification, we quantify the convergence rate in terms of the contraction speed of the actual posterior and the convergence rate of the Classifier. Asymptotic normality results are also provided which justify the inferential potential of our approach. We illustrate the usefulness of our approach on examples which have challenged for existing Bayesian likelihood-free approaches.

Zoom details can be found at: <https://stt.natsci.msu.edu/stt-colloquium-zoom-info/>

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