



The University of Chicago
Department of Statistics
Seminar Series

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Adaptive MCMC: Challenges and Opportunities

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Refreshments following the seminar in Eckhart 110.

ABSTRACT

Markov chain Monte Carlo (MCMC) algorithms are a very popular method of approximately sampling from complicated probability distributions. A wide variety of MCMC schemes are available, and it is tempting to have the computer automatically “adapt” the algorithm while it runs, to improve and tune on the fly. However, natural-seeming adaptive schemes can destroy the ergodicity properties necessary for MCMC algorithms to be valid. In this talk, we review adaptive MCMC, and explain how it can fail using a very simple java applet example (probability.ca/jeff/java/adapt.html). We present a theorem which gives simple conditions that ensure ergodicity. We also consider several high-dimensional adaptive Metropolis and Metropolis-within-Gibbs examples. Finally, we briefly discuss a preliminary general-purpose adaptive MCMC software package (probability.ca/amcmc). Much of this work is joint with G.O. Roberts.