

STANFORD UNIVERSITY
DEPARTMENT OF STATISTICS
MONTE CARLO MARKOV CHAINS IN SCIENTIFIC COMPUTING

3:15 p.m., Thursday, October 12, 2000
Sequoia Hall Rm. 200

Mark Huber
Operations Research
Cornell University

Building a better Metropolis sampler

The vanilla Metropolis approach to creating Markov chains for sampling from high dimensional distributions has been enormously successful. Here we examine methods for speeding up Metropolis for some classes of chains. Many distributions of interest have a parameter such as temperature governing the behavior of samples. The omnithermal technique, developed by Grimmett and applied more generally by Propp and Wilson, allows samples to be taken simultaneously from all values of the temperature parameter under a monotonicity condition satisfied by models such as the ferromagnetic Ising and random cluster models. Liu, Liang, and Wong have proposed the Multiple Try Method (MTM), a version of Metropolis where it becomes easier to specify proposal directions. This can be combined with local optimization techniques such as conjugate gradient for choosing directions. For small multimodal problems numerical results indicate that this approach mixes faster than the straightforward Metropolis.