



The University of Chicago

Department of Statistics

Seminar Series

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College of Computing

Georgia Institute of Technology

Markov Chain Monte Carlo Algorithms

TUESDAY, April 8, 2008 at 12:00 PM
120 KENT HALL, 1020 East 58th Street

Joint seminar with Department of Computer Science

ABSTRACT

In this talk, I'll look at the design and analysis of Markov Chain Monte Carlo (MCMC) algorithms. In the first part of the talk I will present MCMC algorithms which yielded the first polynomial-time algorithms for important combinatorial problems. In particular, I'll present MCMC algorithms for sampling/counting 0-1 contingency tables with arbitrary row/column sums, and estimating the permanent of a non-negative matrix. These algorithms require a sophisticated simulated annealing type approach, with a sequence of problem instances starting from a trivial instance (infinite temperature) and slowly moving to the instance of interest (zero temperature).

In the second part of the talk I will discuss the use of MCMC algorithms in evolutionary biology for phylogenetic reconstruction. I'll present some recent work in that setting where heterogeneous data causes the MCMC algorithms to be slow to converge to the desired posterior distribution.