



The University of Chicago
Department of Statistics

Seminar Series

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IAIN MURRAY

Department of Computer Science
University of Toronto

**Markov Chain Monte Carlo, Normalizers
and Doubly-intractable Inference**

WEDNESDAY, February 25, 2009 at 12:00 NOON
110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

Some probabilistic models are defined by asserting that their distribution over variables is proportional to a non-negative function. The two most common examples are Markov Random Fields (MRFs), also known as undirected graphical models, and some interacting spatial point processes. The normalizing “constant” of such a distribution is a function of its parameters. As the normalizer is often intractable, computing the likelihood of a single setting of parameters is difficult. Just comparing models with fitted parameters on a held out test dataset must be done carefully.

Bayesian inference requires integrating over all settings of a model’s parameters. When this is intractable we routinely turn to Markov chain Monte Carlo (MCMC). However, sampling from the parameter posterior of an unnormalized model is doubly-intractable: every step of a Markov chain seems to require the computation of an intractable normalization term.

I will outline some of my work in dealing with intractable normalizing constants and performing inference with doubly-intractable models. In particular, the exchange algorithm provides a valid MCMC algorithm for some doubly-intractable problems, and has been found useful in a variety of applications.

Work with Ryan Adams, Zoubin Ghahramani, David MacKay, and Ruslan Salakhutdinov.

For further information and about building access for persons with disabilities, please contact Kelly Macias at 773.834.5169 or send email (kmacias@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following web site: <https://lists.uchicago.edu/web/info/statseminars>.