



The University of Chicago
Department of Statistics
Seminar Series

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“Conjunctive Bayesian Networks”

MONDAY, November 13, 2006 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110.

ABSTRACT

Conjunctive Bayesian networks (CBNs) are graphical models that describe the accumulation of events which are constrained in the order of their occurrence. A CBN is given by a partial order on a (finite) set of events. CBNs generalize the oncogenetic tree models of Desper et al. by allowing the occurrence of an event to depend on more than one predecessor event.

I will present a combinatorial solution to the model selection problem for CBNs, discuss how to deal with noisy data, and analyze two datasets where the events are HIV mutations associated with drug resistance. Finally, I will explain why CBNs are nice from the standpoint of algebraic statistics (the phrase “a CBN is a toric variety with a quadratic Gröbner basis” will be explained).

This is joint work with Niko Beerenwinkel (Harvard) and Bernd Sturmfels (UC Berkeley).