Working Group on Statistical Learning Seminar

Title: Bayesian Model Selection for Exponential Random Graph Models

Speaker: Alberto Caimo

Date: Fri 4th March 2011 at 1:00PM

Location: Statistics Seminar Room– L550 Library building

Abstract: Exponential random graph models are a class of widely used exponential family models for social networks. The topological structure of an observed network is modeled by the relative prevalence of a set of sub–graph configurations called network statistics which are regarded as random variables.

One of the key tasks in the application of these models is which network statistics to include in the model. This can be thought of as statistical model selection problem. This is a very challenging problem — the posterior distribution is often termed "doubly intractable" since computation of the likelihood is rarely available, but also, the evidence or marginal likelihood of the posterior is, as usual, also intractable.

We present a fully Bayesian model selection method based on a Markov chain Monte Carlo algorithm of Caimo Friel (2011) which returns a posterior distribution for each competing model as well as some possible approaches for computing the evidence.