Working Group on Statistical Learning Seminar

Title: Latent Position Cluster Model for Social Networks – Model Choice using Reversible Jump

Speaker: Triona Ryan

Date: Fri 25th March 2011 at 1:00PM

Location: Statistics Seminar Room– L550 Library building

Abstract: Network data can be modeled using the latent position cluster model. A mixture model places each actor in a position in latent space, whereby the probability of a relationship between actor i and actor j depends on how far apart they are in the latent space. Actors close in space will be more likely to be connected than those far apart. This clusters the data and gives a good visual representation of the network. One issue with this model is that it is difficult to choose the best con

figuration, i.e. how many groups is most probable. Current literature uses BIC or AICM to do this. The use of reversible jump Markov chain Monte Carlo(RJMCMC) can tackle this problem in a principled manner. RJMCMC allows the Markov chain to jump between models with parameter spaces of varying dimension. Thus simulation over an unknown number of groups is possible. Discussion of further work will include the use of variational Bayesian methods to reduce computational intensity and the application of this model to temporal network data. In order to extend the latent position cluster model to dynamic networks, the number of groups will need to vary across time to tell an interesting story for most datasets.