Statistical Sciences
UNIVERSITY OF TORONTO

SEMINAR

November 6, 2014 at 3:30pm

Sidney Smith Hall, Room 1083

Refreshments will be served at 3:15pm

User Networks as Constraints in Bayesian Probabilistic Matrix Factorization

Cody Severinski, University of Toronto

Low-rank matrix factorization models are commonly applied to recommendation systems as they are simple to implement, scale well to large data sets, and have been shown to outperform other methods in predictive accuracy. The parameters in this model are latent user and item features. In the Bayesian framework, inferring posterior distribution over latent user and item features can be carried out efficiently using Markov Chain Monte Carlo methods. The predictive accuracy is not uniform across the recommendation system. The user-level performance is heavily dependent on the number of ratings a user has provided to the system. In this talk, we will show how user networks (e.g. user-user trust network) can be used to define constraints among users in a matrix factorization model. We show that the conditional posterior distribution for the user features takes an easily interpretable form with respect to user ratings and connections. We will highlight how the inclusion of the user network improves predictive performance for users with few ratings in the system.