



Statistical Sciences
UNIVERSITY OF TORONTO

SEMINAR

March 23, 2017 at 3:30 pm

Refreshments will be provided at 3:15pm

Sidney Smith Hall, Room 2108

Speaker: Yves Atchadé, University of Michigan

Host: Jeffrey Rosenthal

Change-points estimation in large graphical models.

Graphical models and their network parameters are widely used in the applications. In many problems in biology, finance, political sciences it is well-accepted that the underlying networks of interest are not static, but can undergo abrupt changes over time.

Graphical models with change-points are well-suited for this type of settings. However these models are computationally challenging to fit, particularly in the high-dimensional setting.

This talk will present a new algorithm, an approximate majorize-minimize (MM) algorithm, for computing change-points in graphical models. The algorithm is an order of magnitude faster than a brute force approach to the problem. We show that with high probability, the algorithm converges to a value that is within statistical error of the true change-point. A fast implementation of the algorithm using Markov Chain Monte Carlo is also introduced. The performances of the proposed methods are evaluated on synthetic data sets and is also used to explore voting patterns in the US Senate in the 1979-2012 period.

Based on works with George Michailidis (U. Florida), Sandipan Roy (UCL), Leland Bybee (U. Michigan), R. Mazumder (MIT).