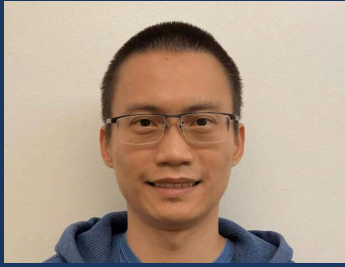


Department of Applied and Computational Mathematics and Statistics Colloquium



Daren Wang
Department of Statistics
University of Chicago

Change Point Detection in High Dimensions

Localizing change points in high-dimensional time series data is a key problem in many scientific and engineering applications, such as predictive maintenance, financial data analysis and security monitoring, to name but a few.

In the first part of the talk, I will discuss change point detection in sparse dynamic networks. Given a sequence of adjacency matrices whose underlying distributions change over time in a piecewise constant manner, the main task is to recover the unknown positions of the change points. I will introduce algorithms that can accurately detect and estimate the change points. I will also provide matching lower bounds to justify the optimality of these algorithms.

In the second part of the talk, I will discuss change point detection in high-dimensional vector autoregressive time series. Assuming that the high-dimensional time series possess piecewise constant transition matrices and are piecewise stable, I will demonstrate an L_0 penalization method that can accurately estimate the change points. Beyond the high-dimensional vector autoregressive models, I will provide a unified framework, with two other high-dimensional change point problems as examples, to unveil the key insights of L_0 penalization approaches in a broad range of settings.

Friday, January 17, 2020

4:15PM – 5:15 PM

127 Hayes-Healy Center

Colloquium Tea 3:45 PM to 4:15 PM 101A Crowley Commons Room