Statistical Sciences
UNIVERSITY OF TORONTO

SEMINAR SERIES 2018-2019

When:	**Monday, August 13, 2018**
Time:	**3:30 – 4:30 pm**
	Refreshments at 3:15 pm
Where:	**Sidney Smith Hall Rm 2105**
Speaker:	**Lixing Zhu, Hong Kong Baptist University**
Host:	**Qiang Sun**

Order Determination for Large Dimensional Matrices

This talk describes how to attack two longstanding problems in determining the model dimensionality (order) when criteria that are based on eigen-decomposition of target matrices are used in practice.

First, due to the existence of some dominating eigenvalues compared to other nonzero eigenvalues, the true dimensionality is often underestimated. Second, the estimation accuracy of any existing method often relies on the uniqueness of minimum/maximum of the criterion. Yet, it is often not the case particularly for the models that converge to a limit with smaller dimensionality.

To alleviate these difficulties, we propose a thresholding double ridge ratio criterion. Unlike all the existing eigen-decomposition-based criteria, this criterion can define a consistent estimate even when there are several local minima. This generic strategy is readily applied to many fields.

As the examples, we give the details about dimension reduction in regressions with fixed and divergent dimensions; about when the number of projected covariates can be consistently estimated, when cannot if a sequence of regression models converges to a limiting model with fewer projected covariates; about ultra-high dimensional factor models and about spiked population models. Numerical studies are conducted to examine the finite sample performance of the method.