

*For favour of posting*

DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE  
THE UNIVERSITY OF HONG KONG

Departmental Seminar

**Dr. Weiming LI**

School of Statistics and Management  
Shanghai University of Finance and Economics  
China

will give a talk  
entitled

## **ON EIGENVALUES OF A HIGH-DIMENSIONAL SPATIAL-SIGN COVARIANCE MATRIX**

### **Abstract**

Sample spatial-sign covariance matrix is a much-valued alternative to sample covariance matrix in robust statistics to mitigate influence of outliers. Although this matrix is widely studied in the literature, almost nothing is known on its properties when the number of variables becomes large as compared to the sample size. We investigate the large-dimensional limits of the eigenvalues of a sample spatial sign matrix when both the dimension and the sample size tend to infinity. Our first result establishes that the distribution of the eigenvalues converges to a deterministic limit that belongs to the family of celebrated generalized Marcenko-Pastur distributions. Using tools from random matrix theory, we further establish a new central limit theorem for a general class of linear statistics of these sample eigenvalues under moment conditions. As applications, by considering the problem of blind source separation, we are able to show through simulation experiments that in high-dimensional situations, the sample spatial-sign covariance matrix is still a valid and much better alternative to sample covariance matrix when samples contain outliers.

on

**Monday, August 19, 2019**

*(Refreshments will be served from 10:45 a.m. outside Room 301 Run Run Shaw Building)*

**11:00 a.m. – 12:00 noon**

at

**Room 301, Run Run Shaw Building**

**Visitors Please Note that the University has limited parking space. If you are driving please call the Department at 3917 2466 for parking arrangement.**

All interested are welcome