



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PHD STUDENT SEMINAR

**Eigenvector distribution for spiked model
with or without missing condition**

By

Ms. Jingming WANG

Abstract

In random matrix theory, one of the central topics is the limiting behavior of eigenvalues and eigenvectors of random matrices under fixed-rank perturbations. A famous model, raised by Johnstone, is the so-called spiked covariance matrix model. It is a sample covariance matrix whose population has all its eigenvalues equal to one except for a few top eigenvalues (spikes). From the Principal Component Analysis (PCA) point of view, the main task is to study the limiting behavior of the top eigenvalues and eigenvectors of the spiked sample covariance matrix. In practice, the observed matrix may have some data missing, which is a ubiquitous phenomenon in statistics. In this case, the effects of the missing data on principal components of the sample covariance matrix shall be studied, in order to recapture the spikes. In this talk, we will consider the high dimensional setting, namely both the sample size n and the dimension p are large. In the first part, we identify the limiting distribution of the eigenvectors associated with the largest eigenvalues for the sample covariance matrix, under fully general assumptions for spikes, without missing condition. In the second part, we introduce the spiked model with missing condition and discuss the eigenvalue distribution.

Date : 15 May 2020 (Friday)

Time : 3:30pm – 4:30pm

Zoom Meeting : <https://hkust.zoom.us/j/98822781307>

All are Welcome!