

For favour of posting

DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE
THE UNIVERSITY OF HONG KONG

Seminar

Professor FAN Jianqing

Frederick L. Moore '18 Professor of Finance
Princeton University
U.S.A.

will give a talk

entitled

**ESTIMATING LARGE COVARIANCE MATRICES
WITH COVARIATES**

Abstract

We propose a factor model for estimating large covariance matrices with covariates and introduce a Projected Principal Component Analysis (Projected-PCA) technique. When it applies to high-dimensional factor analysis, the projection removes idiosyncratic noisy components. We show that the unobserved latent factors can be more accurately estimated than the conventional PCA if the projection is genuine, or more precisely the factor loading matrices are related to the projected linear space, and that they can be estimated accurately when the dimensionality is large, even when the sample size is finite. In an effort to more accurately estimating factor loadings, we propose a flexible semi-parametric factor model, which decomposes the factor loading matrix into the component that can be explained by subject-specific covariates and the orthogonal residual component. The covariates effect on the factor loadings are further modeled by the additive model via sieve approximations. By using the newly proposed Projected-PCA, the rates of convergence of the smooth factor loading matrices are obtained, which are much faster than those of the conventional factor analysis. The convergence is achieved even when the sample size is finite and is particularly appealing in the high-dimension-low-sample-size situation. This leads us to developing nonparametric tests on whether observed covariates have explaining powers on the loadings and whether they fully explain the loadings. Finally, the proposed method is illustrated by both simulated data and the returns of the components of the S&P 500 index.

on

Wednesday, January 21, 2015

(Refreshments will be served from 4:00 p.m. outside Room 303 Run Run Shaw Building)

4:30 p.m. – 5:30 p.m.

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