



統計科學研究所

INSTITUTE OF
STATISTICAL SCIENCE



SEMINAR



STATAS

Seminar

Title : Automatic Sparse PCA for High-Dimensional Data
and Its Applications

Speaker : Prof. Kazuyoshi Yata

(Institute of Mathematics, University of Tsukuba)

Time : 10:30 ~ 12:00, Monday, October 23, 2023

Place : Auditorium, B1F, Institute of Statistical Science

Abstract

Sparse principal component analysis (SPCA) methods have proven to efficiently analyze high-dimensional data. In this talk, we consider threshold-based SPCA (TSPCA) methods in high-dimensional settings. We herein present an investigation of the efficacy of TSPCA for high-dimensional data settings and illustrate that, for a suitable threshold value, TSPCA achieves satisfactory performance for high-dimensional data. Thus, the performance of the TSPCA depends heavily on the selected threshold value. To this end, we propose a novel thresholding estimator to obtain the principal component (PC) directions using a customized noise-reduction methodology. The proposed technique is consistent under mild conditions, unaffected by threshold values, and therefore yields more accurate results quickly at a lower computational cost. Furthermore, we explore the shrinkage PC directions and their application in clustering high-dimensional data. Finally, we evaluate the performance of the estimated shrinkage PC directions in actual data analyses. The talk is based on joint work with Prof. Makoto Aoshima (University of Tsukuba).

※ **Lecture in English. Online live streaming through Cisco Webex will be available.**

※ **The tea reception will be held at 10:10.**