

國立中央大學

統計研究所

學術演講

主 講 人：陳素雲 研究員（中央研究院統計科學研究所）

講 題：A geometric algorithm for contrastive PCA in high dimension

時 間：112年11月14日（星期二）上午11：00 ~ 12：00

地 點：中央大學鴻經館M429室

茶 會：上午 10：30 ~ 11：00 地 點：鴻經館 510 室

ABSTRACT

Principal component analysis has been widely used in exploratory data analysis. Contrastive PCA (Abid et al., 2018, Nature Communication), a generalized method of PCA, is a new tool used to capture features of a target dataset relative to a background dataset while preserving the maximum amount of information contained in the data. With high dimensionality, contrastive PCA becomes impractical due to its high computational requirement of forming the contrastive covariance matrix and associated eigenvalue decomposition for extracting leading components. In this work, we propose a geometric curvilinear-search method to solve this problem and provide a convergence analysis. Our approach offers significant computational efficiencies. Specifically, it reduces the time complexity as well as streamlines the space complexity. Numerical examples are presented to show the merits of the proposed algorithm.

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