高維度空間上的最佳化問題---走在流行

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摘要

Principal component analysis (PCA) has been widely used in exploratory data analysis. Contrastive PCA (Abid et al., 2018), 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 dimensional data, 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 study, we propose a geometric curvilinear-search method to solve this problem and provide a convergence analysis. We also show some interesting examples in the numerical study.