On diffusion factor analysis

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摘要： In this talk, I introduce a discrepancy measure between the global principal component analysis (GPCA) and local principal component analysis (LPCA) in recovering the common components of a large-panel high-frequency data. The asymptotic distribution of the discrepancy measure is provided when the factor space is time invariant as the dimension p and sample size n tend to infinity simultaneously. Alternatively when the factor space changes, the discrepancy measure explodes under some mild signal condition on the magnitude of time-variation of the factor space. We apply the theory to test the invariance in time of the factor space. Beyond testing, we introduce a new method to recover constant factor space. Instead of first aggregating all high-frequency data into a large panel and then doing GPCA, our procedure does PCA with a stream of mini-batch high-frequency data locally first and secondly aggregating the locally estimated factor loadings to fix out the factor space.

个人简介： 孔新兵，南京审计大学教授、博士生导师，入选国家高层次青年人才计划，在统计学顶级期刊发表论文十余篇。2021年江苏省教育系统先进个人（优秀教师），2020年南京审计大学校长奖教金。主持国家自然科学基金项目3项。国际统计协会(ISI)当选会员、国际数理统计学会会员、中国现场统计研究会多个分会常务理事、江苏省"双创博士"、江苏省"青蓝工程"中青年学术带头人。