数学与系统科学研究院

计算数学所学术报告

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报告题目：

A tuning-free scheme for high-dimensional low-rank matrix estimation

邀请人： 刘歆 研究员

报告时间： **2021** 年 **4** 月 **17** 日（周六）

下午 **16:00-17:00**

报告地点： 科技综合楼

311 教室

摘要：

The matrix LASSO, which minimizes a least-squares loss function with nuclear-norm regularization, offers a generally applicable paradigm for high-dimensional low-rank matrix estimation, but its efficiency is adversely affected by outlying observations and heavy-tailed distributions. This talk introduces a robust procedure by incorporating a Wilcoxon-type rank loss function that relaxes the distributional conditions on random error from sub-exponential or sub-Gaussian to more general distributions. A by-product feature of this procedure is that the gradient function of the rank based loss function is completely pivotal, which allows us to obtain appropriate tuning parameter via a simulation method. Under a unified framework which includes matrix regression, multivariate regression and matrix completion as special examples, we establish finite-sample error bounds with a nearly-oracle rate for the new estimator with the simulated tuning parameter. We develop a proximal gradient descent algorithm that is able to yield accurate results with low computation expenses. Theoretical and numerical results indicate that the new estimator can be highly competitive among existing methods, especially for skewed errors.

报告人简介：

邹长亮，南开大学统计与数据科学学院教授，副院长。**2008** 年于南开大学获博士学位，随后留校任教。主要从事统计学及其与数据科学领域的交叉研究和实际应用。研究兴趣包括：高维数据统计推断、大规模数据流分析、变点和异常点检测等，在 **Ann.Stat.**、**Biometrika**、**J.Am.Stat.Asso.**、**Math. Program.**、**Technometrics**、**IISE Tran.**等统计学和工业工程领域期刊上发表论文几十篇，主持国家自然科学基金委重大项目课题等，国家杰出青年基金获得者。

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