数学与系统科学研究院

计算数学所学术报告

报告人：　杨朋昆 助理教授

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报告题目：

Optimal estimation of Gaussian mixtures via denoised method of moments

邀请人：　史斌 副研究员

报告时间：**2021 年 9 月 26 日（周日）下午 15:30**

报告地点：科技综合楼 **311 教室**

Abstract:

The Method of Moments is one of the most widely used methods in statistical inference, obtained by solving the system of equations that match the population and estimated moments. However, in practice and especially for the important case of mixture models, one frequently needs to contend with the difficulties of non-existence or non-uniqueness of statistically meaningful solutions, as well as the high computational cost of solving large polynomial systems. Moreover, theoretical analysis of method of moments are mainly confined to asymptotic normality style of results established under strong assumptions.

In this talk I will present some recent results for estimating Gaussian location mixtures with known or unknown variance. To overcome the aforementioned theoretic and algorithmic hurdles, a crucial step is to denoise the moment estimates by projecting to the truncated moment space before executing the method of moments. Not only does this regularization ensures existence and uniqueness of solutions, it also yields fast solvers by means of Gaussian quadrature. Furthermore, by proving new moment comparison theorems in Wasserstein distance via polynomial interpolation and marjorization, we establish the statistical guarantees and optimality of the proposed procedure. These results can also be viewed as provable algorithms for Generalized Method of Moments which involves non-convex optimization and lacks theoretical guarantees.

报告人简介：

杨朋昆，现任清华大学统计学研究中心助理教授，博士生导师。2013 年本科毕业于清华大学电子工程系，2018 年博士毕业于伊利诺伊大学香槟分校，师从著名统计学家吴毅弘教授，随后在普林斯顿大学从事博士后研究工作两年。 主要从事高维统计理论和与统计相关的优化算法以及可计算性理论方面的研究工作。

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