数学与系统科学研究院

计算数学所学术报告

报告人： 姚方 教授

（ 北京大学统计科学中心 ）

报告题目：

Online Estimation for Functional Data

邀请人： 刘歆 研究员

报告时间：2021 年 4 月 17 日（周六）

下午 **15:00-16:00**

报告地点：科技综合楼

311 教室

摘要：

Functional data analysis has attracted considerable interest, and is facing new challenges of the increasingly available data in streaming manner. In this paper, we propose a new online method to dynamically update the local linear estimates of mean and covariance functions of functional data, which is the foundation of subsequent analysis. The kernel-type estimates can be decomposed into two sufficient statistics depending on the data-driven bandwidths. We propose to approximate the future optimal bandwidths by a dynamic sequence of candidates and combine the corresponding statistics across blocks to make an updated estimation. The proposed online method is easy to compute based on the stored sufficient statistics and current data block. Based on the asymptotic normality of the online mean and covariance function estimates, the relative efficiency in terms of integrated mean squared error is studied and a theoretical lower bound is obtained. This bound provides insight into the relationship between estimation accuracy and computational cost driven by the length of candidate bandwidth sequence that is pivotal in the online algorithm. Simulations and real data applications are provided to support such findings and show the advantages of the proposed method.

报告人简介：

姚方，北京大学讲席教授、国家特聘专家、北大统计科学中心主任，数理统计学会（IMS）Fellow 与理事会成员，美国统计学会（ASA）Fellow。2000 年本科毕业于中国科技大学统计专业，2003 获得加利福尼亚大学戴维斯分校统计学博士学位，曾任职于多伦多大学统计科学系长聘正教授。现担任 Canadian Journal of Statistics 的主编，至今担任 9 个国际统计学核心期刊编委，包括统计学顶级期刊 Journal of the American Statistical Association 和 Annals of Statistics。

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