北京理工大學

数学与统计学院学术报告

Byzantine and Heavy-tailed Distributed Robust Learning via Gaussian Approximation

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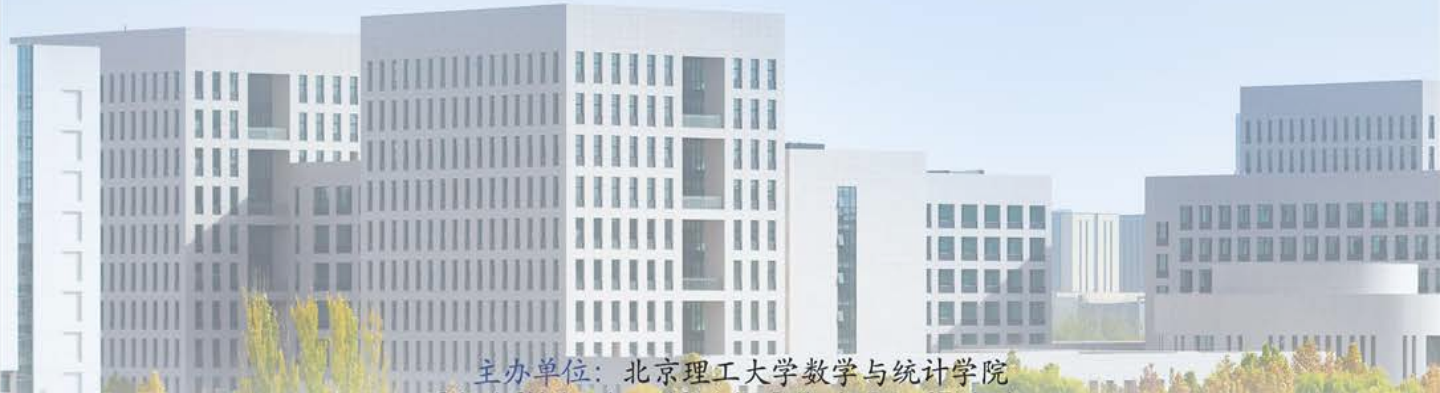
时间： 2025.6.9 下午15:00--16:00

地点： **文萃楼D 703**

摘要：

This study addresses the challenge of designing a Byzantine-robust learning procedure with optimal convergence rates under a Byzantine gradient descent framework. In contrast to prior research focusing on coordinatewise aggregation, our method entails computing the local averages of the sample gradients on local machines and aggregating them via an algorithmic robust mean estimation strategy. Coupled with a consistent estimator of the covariance of gradients, we show that the proposed aggregator achieves a nearly optimal rate that can only obtained for sub-Gaussian data in the non-distributed learning setting, only provided that the $(2 + \kappa)$-th moment of gradients is bounded for some $\kappa > 0$. The effectiveness of our approach is validated through extensive simulations and real-data analyses, showcasing its advantages and robust performance across various scenarios.

报告人简介：**钱成德**，上海交通大学吴文俊博士后，主要研究方向为稳健学习、分布式学习与变点检测方法，相关研究成果发表在运筹优化、机器学习的国际顶尖期刊/会议Mathematical Programming、ICML上。



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