



复旦大学数学科学学院 数学综合报告会

午间学术报告会（二百零二）

报告题目：Online Sparse Regression with Expanding Observables

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报告地点：光华东主楼 2201

摘要：

Online high-dimensional regression has gained increasing attention in recent years, yet existing methods typically assume that all candidate features, including important ones, are observed from the outset of data collection. This assumption is often violated in real-world scenarios, where new variables become available gradually as data accumulate. To address this gap, we introduce a novel framework, Recurrent Adaptive Variable Selection (RAVAS), for online regression with expanding observability. RAVAS employs a recurrent procedure that dynamically updates feature selection as both the sample size and the observable feature set grow. The algorithm is designed to be computationally efficient and memory-light, relying only on low-dimensional sufficient statistics that are updated online. A key advantage of the method lies in its ability to detect and incorporate important variables that emerge later, thereby mitigating the effect of early-stage missingness. We establish theoretical guarantees on model selection, estimation error, and feature coverage, and develop an adaptive online tuning strategy. Extensive simulations and real-world experiments verify the effectiveness of RAVAS for high-dimensional streaming data.

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