

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Rate Minimality and False Discovery Control for High Dimensional Regression

Tuesday, April 13, 2021
10:20 AM - 11:10 AM [Eastern Daylight Time \(EDT\)](#)
Zoom

Abstract

Two major research tasks lie at the heart of high dimensional data analysis: accurate parameter estimation and correct variable selection. Existing literature mostly aims for either the best parameter estimation or the best model selection behavior, however little has been done to understand the potential interaction between the estimation precision and the selection behavior. In this work, our minimax result shows that an estimator's L_2 error rate critically depends on its performance of type I error control, and reveals a trade-off phenomenon between the rate of convergence and the false discoveries control: better estimation accuracy leads to more false discoveries. In particular, we characterize the false discovery control behavior of rate-optimal and rate-suboptimal estimators under different sparsity regimes, and discover a rigid dichotomy between these two estimators under near-linear and linear sparsity settings. In addition, this work provides a rigorous explanation to the incompatibility phenomenon between selection consistency and rate-minimality which has been frequently observed in the high dimensional literature.

Zoom details can be found at: <https://stt.natsci.msu.edu/stt-colloquium-zoom-info/>

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