

ACMS Statistics Seminar

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Wednesday, October 25, 2023

154 Hurley Hall

3:30 PM – 4:30 PM



Temporal-spatial Model via Trend Filtering

This talk will focus on the estimation of a non-parametric regression function designed for data with simultaneous time and space dependencies. In such a context, we study the Trend Filtering, a nonparametric estimator introduced by Mammen and Van De Geer (1997) and Rudin et al. (1992). For univariate settings, the signals we consider are assumed to have a k th weak derivative with bounded total variation, allowing for a general degree of smoothness. In the multivariate scenario, we study a K -Nearest Neighbor fused lasso estimator as in Padilla et al. (2018a), employing an ADMM algorithm, suitable for signals with bounded variation that adhere to a piecewise Lipschitz continuity criterion. By aligning with lower bounds, the minimax optimality of our estimators is validated. A unique phase transition phenomenon, previously uncharted in Trend Filtering studies, emerges through our analysis. Both simulation studies and real data applications underscore the superior performance of our method when compared with established techniques in the existing literature.

The Department of Applied and Computational
Mathematics and Statistics

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