April 20, 2018

STUDENT SEMINAR

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Title

Optimal Nonparametric Estimation with Derivatives

Speaker

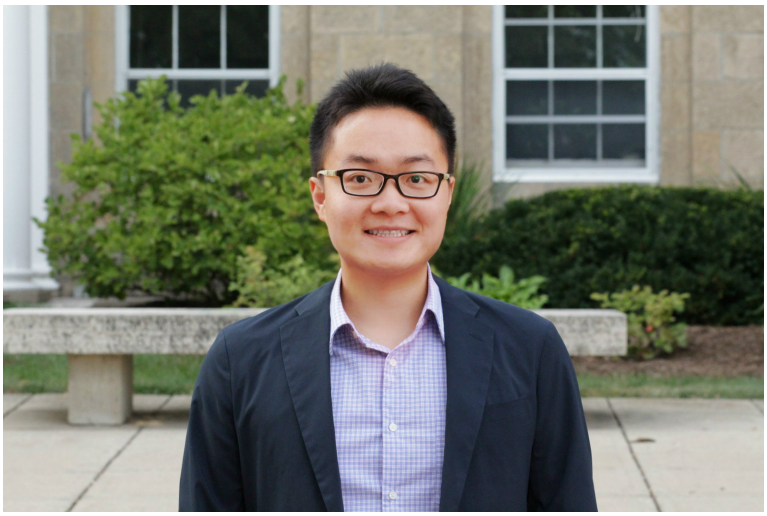
Xiaowu Dai

(Ph.D. student in Statistics, UW-Madison)

Time & Place

Friday, April 20, 4pm, SMI 133

Snacks @ 3:45pm, SMI 133



Abstract

We establish minimax optimal rates of convergence for nonparametric estimation in functional ANOVA models when data from first-order partial derivatives are available. Our results reveal that partial derivatives can improve convergence rates for function estimation with deterministic or random designs. In particular, for full d-interaction models, the optimal rates with first-order partial derivatives on p covariates are identical to those for $(d-p)$-interaction models without partial derivatives. For additive models, the rates using all first-order partial derivatives are root-n, thus achieving the “parametric rate". In addition, we investigate the minimax optimal rates for first-order partial derivative estimations when derivative data are available. Those rates coincide with the optimal rate for estimating the first-order derivative of a univariate function.