Fengshi Niu

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EDUCATION

University of California, Berkeley 8/2015-8/2021

- **Ph.D. in Economics**
  Dissertation: Essays on Econometrics of Dyadic Data
  Principle Advisor: Bryan S. Graham
  Other References: James L. Powell, Michael Jansson
- **M.A. in Statistics**

Tsinghua University 8/2011-6/2015

- **B.A. in Economics and Finance**
  Beijing Outstanding Graduate

PROFESSIONAL EXPERIENCE

Stanford Graduate School of Business - Marketing, Postdoctoral Scholar 9/2021–8/2022

- Developed statistical methods for ads measurement with Harikesh Nair and Navdeep Sahni

Microsoft Research - Office of the Chief Economist, Research Intern 5/2021–8/2021

- Developed differentially private and interpretable algorithms for heterogeneous treatment effect estimation

Facebook - Core Data Science, Research Intern 5/2019–8/2019

- Optimized offline evaluation of ads ranking by utilizing both the experimental data and the non-experimental data pipelines and applying variance reduction technique to the inverse probability weighting estimator
- Improved the correlation between offline estimated metric lift and online experiment metric lift by 11%
- Worked in a cross-functional team with research scientists, product data scientists, and engineers

University of California - Berkeley, Graduate Student Instructor 8/2017–5/2019

- Taught weekly discussion sections, held office hours, designed problem sets, and graded for the following courses: Graduate Econometrics (Econ 240A, 240B), Graduate Game Theory (Econ 201B)

RESEARCH INTERESTS

Econometric Theory, Causal Inference, Machine Learning, Data Privacy, Ads Measurement

RESEARCH PAPERS

Density-Weighted Average Derivatives for Dyadic Data

- Estimate single index regressions for dyadic data by extending a kernel-based semiparametric estimator of density-weighted average derivatives
- Show robust asymptotic normality of the estimator under strong and weak dyadic dependence and under dense or sparse network asymptotics

Differentially Private Estimation of Heterogeneous Causal Effects, with Harsha Nori, Brian Quistoff, Rich Caruana, Donald Ngwe, Aadharsh Kannan, **1st Conference on Causal Learning and Reasoning (CLeaR 2022), Accepted**

- Introduce a general meta-algorithm for estimating conditional average treatment effects (CATE) with differential privacy guarantees
- Implement a differentially private and doubly robust CATE estimator using a class of interpretable, high-accuracy machine learning models with privacy guarantees

Auction Throttling and Causal Inference of Online Advertising Effects, with George Gui and Harikesh Nair

- Identify probabilistic auction throttling as a pervasive source of quasi-experimental variation in digital advertising campaigns
- Construct a weighted instrumental variable estimator utilizing this variation to estimate the causal effect of ads campaigns

Minimax Risk and Uniform Convergence Rates for Nonparametric Dyadic Regression, with Bryan Graham and James Powel, **Revise and Resubmit, Econometric Theory**

- Calculate lower bounds of minimax risk for estimating the nonparametric regression function at a point and under sup-norm for dyadic data
- Calculate the pointwise and uniform convergence rate of Nadraya-Watson kernel regression estimator and show the estimator with the optimal bandwidth achieves the optimal rate suggested by the minimax risk lower bounds

Kernel Density Estimation for Undirected Dyadic Data, with Bryan Graham and James Powell, **Revise and Resubmit, Journal of Econometrics**

- Proposed a kernel estimator of the density function for network data of pairwise outcome
- Showed this nonparametric estimator converged at a "surprising" parametric rate in this setting
- Proposed a robust standard error for this estimator

Optional Intermediaries and Pricing Restraints, with Alex White and Chang Liu

- Built a simple two-sided platform model to show price coherence might lead to higher total consumer welfare
- Applied analytic techniques from the literature of third-degree price discrimination to give sufficient conditions on demand curvature for the result and further explored with numerical examples

PRESENTATIONS

Auction Throttling and Causal Inference of Online Advertising Effects

- Informs Annual Meeting, Virtual 10/2021

Minimax Risk and Uniform Convergence Rates for Nonparametric Dyadic Regression

- Berkeley Econometrics Seminar, Department of Economics, UC Berkeley 12/2020

Kernel Density Estimation for Undirected Dyadic Data

- Berkeley-Stanford Econometrics Jamboree, Department of Economics, UC Berkeley 11/2019

Optional Intermediaries and Pricing Restraints

- Toulouse Digital Economics Conference, Toulouse School of Economics, France 1/2019

TECHNICAL TOOLS

Python, R, SQL, Stata, bash, git, LaTeX, plotly, scikit-learn, statsmodel, xgboost, Keras, EconML, InterpretML

LANGUAGES

English (fluent), Mandarin (native)

Updated 2022/01/13