Application for NBER Digital Economics & AI Tutorial

February 11–12, 2026 · Stanford University

Applicant: Wenxiao Yang
Institution: University of California, Berkeley (Haas School of Business)
Email: ywenxiao@berkeley.edu

1. Graduate Study Profile

Current Status: Ph.D. Candidate in Quantitative Marketing
Years of Enrollment: 2023 – Present

I am a Ph.D. student in the Quantitative Marketing group at UC Berkeley's Haas School of Business. My research focuses on the economics of algorithms, using game theory, information design, and mechanism design to analyze strategic behavior in digital markets and AI systems. I have completed advanced coursework in microeconomic theory, econometrics, and industrial organization, and my research training combines theoretical modeling with structural estimation and computational methods to study algorithmic decision-making and AI-powered systems from a strategic perspective. This training places my coursework and research squarely within the core topics of the NBER Digital Economics & AI Tutorial.

During my Ph.D. studies, I have been recognized with several research grants and fellowships, including the Berkeley Center for Responsible, Decentralized Intelligence (RDI) Frontier Research Fellowship, the Fisher Center for Business Analytics Grant, and the OpenAI API Researcher Access Program. I also served as a Ph.D. Research Intern at Shanghai AI Lab, where I gained hands-on experience with AI research and applications.

Graduate Level Coursework at UC Berkeley:

- Microeconomic Theory I — Chris Shannon, Shachar Kariv
  (Choice theory: preferences and utility, consumer demand theory, revealed preference, choice under uncertainty, social choice theory; General equilibrium: exchange economies, production models, existence and properties of competitive equilibrium, welfare theorems, core convergence, equilibrium under time and uncertainty)
- Microeconomic Theory II — Federico Echenique, Haluk Ergin
  (Non-cooperative game theory: normal-form and extensive-form games, Nash equilibrium, Bayesian Nash equilibrium, subgame-perfect equilibrium, repeated games and folk theorems; Information economics: adverse selection, signaling, screening, mechanism design, principal-agent problems, auctions and optimal auction design)
- Econometrics I — Bryan Graham, Michael Jansson
  (Probability theory and statistical inference, K Normal means problem, statistical decision theory, linear regression and least squares, Bayesian and frequentist inference, large sample theory, quantile regression)
- Econometrics II — Demian Pouzo, Vira Semenova
  (Bootstrap methods, endogeneity and instrumental variables, GMM estimation, panel data models with fixed effects, time series models; M-estimation, maximum likelihood, binary response models, quantile regression, high-dimensional methods with lasso and ridge penalization)
- Topics in Econometrics (Time Series) — Michael Jansson
  (Univariate and multivariate stationary time series, MA and AR models, VAR models, spectral analysis, GMM estimation, unit root asymptotics and testing, nonstationary time series)

- Topics in Game Theory — Yuichiro Kamada
  (Epistemics, equilibrium refinements, repeated games, continuous-time games, learning in games)
- Topics in Mathematics (Market Design) — Alexander Teytelboym
  (Matching theory with and without transfers, mechanism design, stable matchings, assignment games and core, auctions and networks, school choice and object allocation, kidney exchange, random allocation mechanisms and pseudomarkets, auction design)
- Industrial Organization I — Nano Barahona
  (Structural demand estimation with BLP and micro-data methods, nonparametric identification, entry and exit models, applications to education markets, media and advertising, urban economics, environmental policy, quality disclosure and certification)
- Industrial Organization II — Matthew Backus, Quitze Valenzuela-Stookey
  (Mechanism and information design, empirical auction models and identification, bargaining theory and empirics, collusion and repeated games, conduct testing, regulation theory, matching models, productivity estimation, dynamic games and estimation, antitrust policy)
- Marketing Strategy — J. Miguel Villas-Boas
  (Game-theoretic models of pricing and competition, product line design and price discrimination, channel coordination, dynamic competition with switching costs, advertising, continuous time search models)
- Choice Modeling — Przemyslaw Jeziorski
  (Structural demand estimation with BLP models, Bayesian methods for preference heterogeneity, supply-side estimation and merger simulation, vertical integration and contracts, price discrimination, two-sided markets, auction theory and estimation, dynamic discrete choice models, search and switching costs, industry dynamics with entry/exit)
- Buyer Behavior (Judgment and Decision Making) — Leif Nelson
- Topics in Algorithms and Marketing — Ganesh Iyer
  (Algorithmic collusion and pricing, AI in games and strategic interactions, information design and persuasion, privacy and data markets, digital addiction and self-control models)
- Machine Learning & Human Behavior — Serina Chang
  (LLM-based behavioral simulation, agent-based modeling, algorithmic confounding and feedback loops, performative prediction, human-AI interaction evaluation and personalization)
- Formal Models of Political Science — Andrew Little
  (Signaling and persuasion models, cheap talk and communication games, principal-agent models with career concerns, dynamic games and Markov Perfect Equilibrium, accountability and electoral competition, behavioral models with biased beliefs)
- Political Economy: Frameworks — Samuel Kapon
  (Formal models of political economy, communication and persuasion in political settings, accountability and principal-agent models, dynamic political games, electoral competition, bargaining and conflict, institutional design)

Graduate Level Coursework at UIUC:

- Pricing and Revenue Management — Xin Chen
  (Quantity-based revenue management, assortment optimization, dynamic pricing, choice modeling, joint pricing and inventory control, demand estimation and learning)
- Game Theory and Fair Division (Algorithmic Game Theory) — Jugal Garg
  (Fair division: envy-freeness, proportionality, competitive equilibrium, MMS allocation; Game theory: Nash equilibrium, minimax theorem, correlated equilibrium, Nash bargaining, Shapley value; Price of anarchy, mechanism design, auctions, matching markets)

- Computational Inference and Learning Pierre Moulin
  (Bayesian inference, maximum likelihood and MAP estimation, empirical risk minimization, stochastic gradient descent, Monte Carlo methods and particle filtering, EM algorithm, hidden Markov models, graphical models, variational inference, l1 penalized regression, compressive sensing)
- Linear Programming, Nonlinear Programming, Optimization, Unsupervised Learning, Deep Learning...

2. Research Interests and Projects

Primary Research Interests:
Economics of Algorithms, Digital Economics, Platform Economics, Game Theory, Information Design.

Projects:

1. **"Strategic Disinformation Generation and Detection"**
   Wenxiao Yang, Yunfei (Jesse) Yao and Pengxiang Zhou
   Minor Revision at Management Science
   Presented at Summer Institute in Competitive Strategy (SICS) 2025
   Studies a strategic communication game with noisy disinformation detection, characterizing how general trade-offs between true- and false-positive rates shape lying incentives and optimal detector design in digital environments.

2. **"On the Role and Design of Resale Royalties"**
   Wenxiao Yang, Zijun (June) Shi and Song Lin
   Under Review at Management Science
   Presented at 18th Annual Bass FORMS Conference (Bass) 2024
   Develops a unified model of resale markets with royalties for physical and digital assets, showing how prices and royalty rates jointly signal quality and why privately optimal royalty policies on digital platforms typically exceed socially optimal levels, providing guidance for platform policy design and regulation.

3. **The Economics of AI Identity Disclosure** (In Progress)
   Studying how AI identity disclosure shapes strategic interaction between human and algorithmic agents in simple games and markets of AI agents, using game-theoretic tools and LLM-based simulations.

3. Dissertation Details

Dissertation Abstract/Description:
My dissertation studies digital economics foundations of strategic interaction between algorithm designers and human decision-makers using game theory and information design. I am developing theoretical frameworks that examine how liability and disclosure policies govern the design and pricing of algorithmic services, with attention to how heterogeneous learning environments (e.g., diffusion-type and Poisson search processes) change optimal information architectures. The work links directly to the tutorial's themes by emphasizing market design for AI systems, incentive-compatible disclosure, and regulatory instruments that shape the behavior of AI providers and users and the resulting welfare implications. The goal is to deliver policy-relevant guidance for regulators designing AI governance frameworks and for organizations deploying AI-enabled decision support tools in both platform and non-platform environments.

Dissertation Committee:

- **J. Miguel Villas-Boas** (Chair), *Haas School of Business, UC Berkeley*