Yikang Shen

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Graduate Level Courses

Carnegie Mellon University Ph.D., Economics

- 2022-23: Measure Theory; Behavioral Economics;
- 2021-22: Causal Econometrics; Convex Optimization; Information Economics; Macro Finance; Public Economics; Probability and Mathematical Statistics; Introduction to Machine Learning;
- 2020-21: Market Design; Mechanism Design; Microeconomics I,II,III; Macroeconomics I,II,III; Econometrics I,II,III; Computational Methods for Economics;

University of Washington M.S., Statistics

- 2019-20: Advanced Time Series Analysis; Network Optimization; Analysis of Categorical Data; Regression Methods of Independent and Dependent Data;
- 2018-19: Design and Analysis of Experiments; Statistical Inference; Causal Modeling; Statistical Methods of Spatial Data; Applied Regression; Statistical Computing, Non-parametric Regression and Classification;

Research Projects

The Cost of Decentralized Market-Making | *joint work with Bryan R. Routledge and Ariel Zetlin-Jones*

- The automated market maker brings a decentralized exchange system to the world of decentralized digital currency and challenges the dominance of centralized limit order markets, such as Coinbase and Binance. It relies on a pre-defined function to decide the exchange prices. Besides the spirit of decentralization, the AMM allows crypto owners to gain interest by liquidity provision like traditional money. However, it comes with a cost. We provide a framework to analyze the movement of the exchange rates. We show how the liquidity taker hurts the return of the liquidity provider. As the liquidity needs to be locked in the AMM, the liquidity provider also suffers additional risk from the limited adjustments on the portfolio shares. We also show how the level of fee rate affects the return and risk of the liquidity provider, which leads to the optimal level of fee rate. We provide a pricing formula that retains the merit of the commonly used constant product formula and minimizes the cost of the liquidity provider.

The Optimal Recommender System | *joint work with Maryam Saeedi and Ali Shourideh*

- Can we really trust the information coming from the social platforms' recommender systems? We consider the case when a platform can choose to send out information to a user, who wants to acquire the true state. The platform is assumed to be profit-oriented and want to keep the user active as long as possible. We characterize the platform-optimal signals. When the platform is more patient than the user, the optimal signal structure is to release information gradually. When the user is more patient than the platform, the optimal signal structure is to release information by at most two opportunities. Generally, we characterize the optimal strategies for dynamic Bayesian persuasion problems when the sender's payoff only depends on the duration of the game but not the final decision of the receiver.

Research Interest

Generally, I'm interest in how modern technology–machine learning and A.I.–affects people's behavior patterns and what's the policy implication accordingly. More specifically, I'm interested in the functions and limitations of virtual markets, the market of information in particular.