

NAN ZHAO

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EDUCATION

BOSTON UNIVERSITY, Department of Economics (Ranked 11th in the U.S.)

Ph.D., Econometrics and Quant Economics (STEM)

Fields of Interest: Game Theory, GPA: 3.84/4

- Distinction in Microeconomics and Macroeconomics qualifying exams
- Dean's Fellowship, 2015-2020
- Summer Research Grant, 2019

Boston, MA
May 2021

PEKING UNIVERSITY

B.S., Mathematics, School of Mathematical Sciences, Major GPA: 3.65/4

B.A., Economics, National School of Development, GPA: 3.80/4

- Second Prize in the 10th Peking University Mathematical Contest in Modeling

Beijing, China
June 2015
June 2015

AWARDS AND DISTINCTION

- Silver Medalist of 2010 and 2011 China Mathematical Olympiad (CMO)
- Winner of World Youth Chess Championship 2004 Boys U12

SKILLS

- Econometrics: Panel Data Regression, Hypothesis Testing, Causal Inference, Logistic Regression, GMM, Bootstrap
- Machine Learning: Deep Neural Network, Deep Reinforcement Learning, RNN, LSTM, Natural Language Processing
- Statistics: Markov Chain, Monte Carlo Simulation, Factor Analysis, Cross Validation
- Finance: Asset Pricing, Portfolio Optimization, Equity Valuation
- Programming: Python, MATLAB, R, LaTeX

RESEARCH

Dynamic Incentive Provision When Evaluation Takes Time

- Constructed a continuous-time model with dynamic moral hazard and stochastic processes including Brownian motion and Poisson process; incorporated a novel ingredient that the agent's performance is evaluated over time
- Derived mathematically the optimal contract by solving a nonlinear differential equation; proved that the optimal payment scheme features a combination of compensation for failure and reward for success with delay
- Simulated the evolution of the agent's lifetime utility by the value function iteration algorithm in a constrained dynamic programming problem

Deep Reinforcement Learning for Trading: A Loss Averse Agent

- Designed a new trading strategy by training a loss-averse deep reinforcement learning agent, using the actor-critic based Proximal Policy Optimization (PPO) algorithm
- Backtested the strategy on the Dow Jones 30 constituent stocks using historical daily data from 2008 to 2020
- Achieved an average Sharpe ratio of 0.86 given a transaction cost of 0.1%, which significantly outperforms Dow Jones Industrial Average (DJIA)

Stock Price Movement and Total Factor Productivity

- Identified stocks bubble using the HP filter in time series analysis for US and China listed firms since 1990
- Constructed Bartik instrument variables using U.S. import and export data
- Identified that stocks bubble would cause listed firms with larger capital return to invest more

TEACHING

- Teaching Assistant, Microeconomics (Ph.D. core), Department of Economics, Boston University, Fall 2016 - Spring 2020

CONFERENCES AND PRESENTATIONS

- The 6th World Congress of the Game Theory Society, July 2021 (scheduled)
- European Winter Meeting of the Econometric Society (virtual), December 2020
- Boston University Graduate Economics Association Poster Session, November 2019
- The 30th Stony Brook International Conference on Game Theory, July 2019