Haoyan (Steven) Shi

Evanston, IL | (734) 450-5180 | haoyan.shi@outlook.com | LinkedIn

EDUCATION

Northwestern University **GPA: 4.0/4.0**
Bachelor of Arts in Mathematics and Computer Science Expected June 2025

- **Honors**: James B. Angell Scholar, Merit-Based Scholarship ($5,250/year), University Honors
- **Activities**: Teaching Assistant of Entrepreneurial Finance, mentored 50+ students in total, Grader of Discrete Math
- **Coursework:** Mathematical Finance (Derivatives Pricing), Portfolio Optimization, Probability Theory, Stochastic Processes, Linear Algebra, Calculus, Differential Equations, Data Structures & Algorithms, Machine Learning, Deep Learning, Reinforcement Learning, Statistics

SKILLS AND ACTIVITIES

***Software Skills*:** Python (PyTorch, TensorFlow), C++, C, R, Stata, SQL, MATLAB, Gurobi, MOSEK, NetLogo, Excel (Xlookup, Pivot, VBA)
***Awards*:** Plante Moran Employer Challenge (M&A Case Competition) – Top 1 Winning Team
***Leadership*:** Founder and President of Blue Records Group (organized the "Blue Records Music Festival", with 200+ attendees)
***Interests*:** Music Composition, Movie Soundtrack Composition, Audio Engineering, Piano, Guitar, Drum

WORK EXPERIENCE

Northwestern University McCormick School of Engineering **Evanston, IL**
Research Assistant September 2023 – Present

- Conducted experiments in portfolio optimization by training, validating, and testing classic mean variance and novel robust models
- Authored an original technical research paper as the first author in theoretical computer science and mathematical optimization, *On Approximation of Robust Max-Cut and Related Problems using Randomized Rounding Algorithm*, arXiv: 2406.01856
- Composed literature reviews on statistical methods in portfolio management, including robust correlation measures

Guotai Junan Futures **Shanghai, China**
Investment Data Analyst Intern (Investment Department - Fund of Funds) June 2023 – August 2023

- Coordinated Barra Risk and CTA factor analysis projects by automating daily web scraping of trading information, monitoring factor returns, and predicting stock options' volatility using machine learning models, accelerating due diligence for target investment funds
- Improved grading algorithms of target funds' performance by optimizing Python code to calculate measures such as Alpha using a time series of net asset values and restructured data with SQL, reducing the runtime when calculating thousands of funds simultaneously

Northwestern University Kellogg School of Management **Evanston, IL**
Research Assistant March 2023 – September 2023

- Initiated a sentimental analysis exploring the impact of patent-related news on stock market, focusing on the spillover effect on companies
- Utilized Natural Language Processing (BERT and GloVe) models in Python to perform textual analysis on large datasets of patent descriptions, tech examples, and workers' tasks, with analyzed correlations using cosine similarity scores of pairwise textual embeddings

CEPRES **Denver, CO**
Private Equity Analyst Intern July 2022 – April 2023

- Constructed customized analysis dashboard for LP clients, including aggregate fund IRRs benchmarked against market indices such as MSCI World, clustering of invested GPs' MOICs by strategies and geographical focus, and value creation waterfall models for underlying deals
- Automated data collection and transition process through developing Python scripts, reducing 60% of manual work in investment data processing, and allowing LPs to receive fund performance analysis reports faster

Dynamic Consulting – Shanghai **Shanghai, China**
Business Analyst Intern May 2021 – July 2021

- Conducted data analysis of the Chinese printing market, including tiered analysis of market players, identifying client product's market penetration rates by region, and calculating the total addressable market
- Identified data center as the most promising vertical of the Chinese HVAC market by conducting desk research, estimating CAGR for the next 5 years, and analyzing market size by HVAC products versus installation services

PROJECT EXPERIENCE

Single Stock Simulation with Multiple Agents March 2024 – Present
Independent Project at Northwestern University

- Designed and implemented an agent-based model for a single stock in NetLogo involving two types of trader agents: fundamental investors and quantitative investors (using deep Q-learning)
- Analyzed emergent behaviors of the artificial financial market including agent behaviors' influence on market volatility and evolution of algorithmic trading strategies over time

SEC Policy Analysis Project - Northwestern University Pritzker School of Law February 2023 – Present

- Manipulated and analyzed data to study the effect of SEC's short-sale experiment on short interests, share prices, and volatility
- Performed randomization inference in STATA to evaluate the validity of regression specifications in studies of Reg SHO Pilot Program
- Conducted Difference-in-Differences (DiD) regression in STATA to evaluate policy intervention with staggered adoption dates

U-M Mathematics REU Program April 2023 – August 2023
Selected Participant with $4,800 stipend

- Researched soliton solutions of the KdV Equation (3rd order partial differential equation) through the scattering transform (my paper link)