Xiaobing (Icy) Shen

207 Church Street SE, Department of Industrial and Systems Engineering, Room 235F, Minneapolis, MN 55455
shen0341@umn.edu Xiaobing Shen-Linkedin Xiaobing-Shen.github.io

Professional Objective

To secure a summer internship in 2023 in the field of Data Science, Operations Research, or Software Engineering where I can utilize my expertise in Natural Language Processing, data analysis, and optimization. Leveraging my Ph.D. in Industrial and Systems Engineering with a 4.0 GPA, along with my experience from several internships and my strong programming skills in Python, C, and SQL, I am confident in my ability to make meaningful contributions to your organization.

Education

University of Minnesota, Twin Cities **Sep. 2019 – Jun. 2024 (Expected)**
Doctor of Philosophy, Industrial and Systems Engineering **GPA:** 4.0/4.0

- **Research Interests**: Pricing and Revenue Management, Supply Chain Management
- **Advisor:** Saif Benjaafar
- **Methodology**: Stochastic Modeling and Optimization, Online Learning Algorithms, Queueing Theory

University of Minnesota, Twin Cities **Sep. 2019 – Nov. 2022**
Master of Science, Industrial and Systems Engineering **GPA:** 4.0/4.0

- **Relevant Coursework**: Production Planning and Inventory Control, Analytics/Data-Driven Decision Making, Decision Analysis, Reinforcement Learning and Dynamic Programming, Optimization for Machine Learning, and Modern Nonconvex and Nondifferentiable Optimization

Shanghai University of Finance and Economics **Sep. 2014 – Jun. 2018**
Bachelor of Management, Information Management and Information Systems **GPA:** 3.72/4.0 (Top 4%)

- **Honors**: Academic Scholarships for Undergraduate Students, Community Scholarship for Senior Students (2017), Learning Excellence Award (top 2%)
- **Relevant Coursework**: Applied Regression Analysis, Statistics, Stochastic Process, Machine Learning, Deep Learning, Text Mining, Linear and Nonlinear Programming, Convex Optimization, and Game Theory

Academic Paper

- Saif Benjaafar, Xiaobing Shen (2023) "Pricing in On-Demand and One-Way Vehicle-Sharing Networks". Operations Research 0(0).
- Benjaafar, Saif, and Gao, Xiangyu, and Shen, Xiaobing, and Zhang, Huanan. (2023) "Online Learning for Pricing in On-Demand Vehicle Sharing Networks". Available at SSRN: https://ssrn.com/abstract=4344364. Submitted.

Related Experience

HourCar **Jun. 2022 – Aug. 2022**
Data Analyst Intern Minneapolis, MN, United States

- Designed and implemented a PostgreSQL database with structured data tables, providing analytic support for team members.
- Conducted thorough data collection and analysis on trip, station, and customer data, comparing pre- and post-introduction of electric vehicles.
- Analyzed customer behavior patterns to determine differences between fuel and electric vehicle usage and made recommendations to enhance the customer experience across various vehicles and stations.
- Developed a pricing model based on theoretical research and proposed parameter estimation methods using historical data, providing insights into maximizing profitability.

Cardinal Operations **Sep. 2018 – Jul. 2019**
Optimization Engineer Intern Shanghai, China

- Designed and implemented a Mixed-Integer Programming (MIP) model for production planning and scheduling using C++, evaluating its efficiency through the creation and analysis of large-scale data.
- Conducted a comprehensive examination of the flight scheduling problem, proposing a highly effective column generation algorithm as a solution. Implemented the algorithm in a combination of Python, C, and Cython, demonstrating its robustness and efficiency in solving the problem.

LUFAX.com **Jun. 2018 – Jul. 2018**

Data Science Intern Shanghai, China

- Developed a mixed model comprising several Machine Learning classifiers, including SVM and Random Forest, to solve the client selection problem with high accuracy.
- Leveraged behavioral data points from a pool of 1.02 million clients to identify and propose 230,000 prospective clients for targeted marketing efforts.
- Achieved impressive results with 78% of the recommended clients purchasing equity-linked funds from Aug. 13 to Sep. 1, demonstrating the effectiveness of the proposed model.

SHUFE LEAVES Solver Project **Sep. 2017 – Jan. 2018**

Optimization Analyst Shanghai, China

- Implemented several popular pre-conditioner methods, including MIQR, LSQR, LSMR, Diagonal Preconditioning, and RIF, to solve the normal equation problem and evaluated their performance.
- Conducted a thorough analysis of the matrices from the UFL Collection (2648 problems), calculating all relevant statistics and image features.
- Constructed a mixed model combining a Convolutional Neural Network and Random Forest to predict the optimal pre-conditioner for a given matrix, based on its image and statistical information.

Sinolink Securities Co. **Jun. 2017 – Jul. 2017**

Trading Data Analyst Intern Shanghai, China

- Conducted extensive research on the application of Machine Learning and Deep Learning in global stock selection, and presented effective models to a portfolio manager and senior analysts.
- Analyzed historical trading data using time series models, such as Moving Average and Seasonal-ARIMA, to identify seasonal and evolutionary trends.
- Proposed a stock selection model that leverages the Adaboost algorithm to integrate weaker classifiers, and evaluated the performance of Deep Learning models, such as LSTM, in predicting stock price direction.

JD.com **Apr. 2016 – Jun. 2016**

Warehouse Optimization Engineer Shanghai, China

- Analyzed the complex matching problem between vans, shelves, and workstations, and devised a solution by dividing the original relaxed MIP problem into two equivalent sub-problems under the guidance of advisors.
- Utilized CPLEX to solve the sub-problems, and implemented the Hungarian Algorithm in C to enhance the efficiency of the Mixed-Integer Programming solution for the matching problem.
- Demonstrated that the Hungarian Algorithm was approximately 1.6 times faster than using CPLEX alone.

Skills

Mathematical Modeling: Experienced in implementing mixed-integer programming models for production planning and scheduling, and flight scheduling problems.
Data Analysis and Machine Learning: Proficient in analyzing data and implementing machine learning models for client selection and stock selection problems, using methods such as Adaboost, SVM, Random Forest, LSTM, and CNN.
Time Series Analysis: Experienced in utilizing advanced time series models, including Autoregressive Integrated Moving Average (ARIMA), SARIMAX (Seasonal ARIMA with exogenous variables), and state-space models such as Kalman Filters and Unscented Kalman Filters. Proficient in utilizing Prophet, a powerful time series forecasting library for Python and R. Knowledgeable in the latest techniques and tools for time series analysis and forecasting.
Programming Language: Strong knowledge and hands-on experience in programming languages such as Python (TensorFlow, PyTorch), C, C++, SQL and Cython

Teaching Experience

Simulation | Teaching Assistant **Sep. 2022 - Dec. 2022**
Quality Engineering and Reliability | Teaching Assistant **Jan. 2022 - May. 2022**
Simulation | Teaching Assistant **Sep. 2021 - Dec. 2021**
Production and Inventory Control | Teaching Assistant **Jan. 2021 - May. 2021**
Optimization | Teaching Assistant **Sep. 2020 - Dec. 2020**
Analytics for Personalized Medicine | Teaching Assistant **Jan. 2020 - May. 2020**
Optimization | Teaching Assistant **Sep. 2019 - Dec. 2019**

Selected Presentations

Pricing in On-Demand (and One-Way) Vehicle Sharing Networks | INFORMS Annual Meeting **Oct. 2022**
Pricing in On-Demand (and One-Way) Vehicle Sharing Networks | INFORMS Revenue Management and Pricing **Jun. 2022**
Pricing in On-Demand (and One-Way) Vehicle Sharing Networks | INFORMS Optimization Society **Mar. 2022**