Xiaohe Luo

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EDUCATION

Princeton University Princeton, NJ

Ph.D., Operations Research & Financial Engineering Expected Graduation: May 2023

- **Overall GPA**: 3.81/4.00
- **Core Courses**: Statistical Foundations of Data Science, Reinforcement Learning, Machine Learning & Pattern Recognition, Statistical Theory, Probability Theory, Linear & Nonlinear Optimization, Convex & Conic Optimization
- **Research Interests:** Stochastic Optimization, Reinforcement Learning, Machine Learning

University of California, San Diego La Jolla, CA

Bachelor of Science, Joint Mathematics-Economics Sept 2017

- **Overall GPA**: 3.93/4.00
- **Honors & Awards**: Magna Cum Laude, Award for Excellence in Joint Mathematics – Economics (one per year)

RESEARCH EXPERIENCE

Graduate Research Assistant, CASTLE Lab Princeton, NJ

Department of Operations Research &Financial Engineering, Princeton University Oct 2019 to Present

- Designed a one-dimensional stochastic search algorithm (SBES), based on entropy reduction, for effectively finding the optimum of a black-boxed, unimodal function under a high level of noise and expensive computational costs. The algorithm is proven to be robust by both theoretical guarantees and empirical results.
- Configured a simulator in Python with visualization tools that implements the SBES algorithm in various applications such as optimizing stepsizes of stochastic gradient algorithms, tuning hyperparameters of machine learning algorithms and finding the optimal business setup that maximizes revenue with noisy feedback.

Undergraduate Research Assistant, Todd Kemp La Jolla, CA

Department of Mathematics, UC San Diego Jul 2017 to Sept 2017

- Researched random symmetric band matrices, specifically matrices with independent diagonals but correlated entries along each band; Proved asymptotic theorems using techniques in combinatorics and real analysis.
- Developed applications in Matlab and Mathematica that perform numerical simulations and graphing to approximate the limiting spectral distribution of the eigenvalues of large random band matrices.

SELECTED INVITED PRESENTATIONS

"Entropy Minimization for Optimization of Expensive, Unimodular Functions" April 2022

Electrical & Computer Engineering, Johns Hopkins University

- an invited talk by Professor Enrique Mallada's lab

"An Entirely Novel Perspective on Choosing Stepsizes for SGD: Entropy Minimization for Optimization of Expensive, Unimodular Functions" April 2022

New York City Operations Day, New York

- poster presentation

INDUSTRY EXPERIENCE

Schonfeld Strategic Advisors New York, NY

Quant Researcher Intern May 2022 to Aug 2022

- **Multi-period Optimization of Trading Scheduling**
  - Studied a high-dimensional sequential decision problem that determines the optimal trading trajectory while controlling transaction cost and portfolio risk. Proposed strategies successfully reduced risk by a power of three in backtesting of a portfolio with 2600 assets. Managed to develop a mechanism that further improves polynomial runtime of the described strategies to linear runtime.

King Street Capital Management, L.P. New York, NY

Data Scientist Intern June 2020 to Aug 2020

- **Revenue Prediction via Neural Networks**
  - Conducted data augmentation and revenue prediction for "time-lagged" industries such as hotels, cruise lines,

and traveling services via time-series credit card data.
- Constructed robust prediction models by leveraging Long Short-Term Memory (LSTM) and Recurrent Neural Network with Attention, which successfully identified the key features of the time-series data and achieved a 20% increase in the estimated profit of our portfolio.

- **Performance-based Unsupervised Learning**
  - Classified hundreds of industries into different categories based on the level of impact of Covid-19 measures on the YoY revenues across 2 years for market analysis. Applied clustering methods such as K-means and Agglomerative Hierarchical clustering to identify underlying factors, resulted from Covid-19 measures, that directly associate with businesses' performance.

TEACHING EXPERIENCE

Assistant in Instruction at Princeton University Sept 2019 to May 2021
ORF 363: Computing and Optimization for the Physical and Social Sciences
ORF 307: Optimization

Teaching Assistant at UC San Diego Sept 2016 to Jun 2017
Math 18: Linear Algebra
Math 10B: Calculus
Math 3C: Pre-Calculus

LEADERSHIP AND COMMUNITY INVOLVEMENT

Officer of Graduate Women in STEM (GWiSE) Sept 2021 to Present
Princeton University

Graduate Committee Representative March 2022 to Present
Department of Operations Research & Financial Engineering, Princeton University

SKILLS

Actuarial Exams: Passed Exam P/Probability Theory
Programming Languages: Proficient in Python (TensorFlow, Keras, PyTorch, MOSEK), R, Matlab, Stata; Functional in Java and JavaScript
Languages: Fluent in Chinese and Cantonese; Conversational in Japanese