# Kuo Liang

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## RESEARCH INTERESTS

Supply Chain Management; Revenue Management; Mixed-Integer Programming; Online Learning

## EDUCATION

**Shanghai University of Finance and Economics**, Sep. 2022— June 2025
*Master's Degree in Management Science and Engineering(**Rank: 1/71**)* 3.98/4.00

- Relevant Coursework: Advanced Operations Research and Optimization Theory (97), Stochastic Models (95),Operations Management (93), Revenue Management (92), Market Mechanism Design (94), Online Learning(92)

**Shanghai University of Finance and Economics**, Sep 2018— June 2022
*Bachelor's Degree in Information Management and Information System (Outstanding Graduate)*

- Relevant Coursework: Information System Analysis and Design (90); Decision Simulation (91)

## RESEARCH EXPERIENCE

**A Decomposition Acceleration Framework for Third-Party Integrated Decision-Making**
*Supervisor: Zizhuo Wang (Ready Submitted to IJOC)* Martch 2023 — Present

- Formulated a third-party logistics company's integrated decision problem as a multi-period mixed-integer program with the objective to minimize total costs under complex coupling constraints.
- Proposed a large-scale acceleration framework incorporating column generation combined with machine learning, the sweeping and column selection techniques for the linear relaxation problem.
- Designed a specific rounding algorithm to recover the integer optimal solution. Guaranteed a near-optimal solution within a 1% optimality gap and increased solution speed by 70% compared to the benchmark on both synthetic and real-world datasets.

**Joint Acceptance and Fulfillment Policy in an Omni-channel Environment**
*Supervisor: Chaolin Yang (Working Paper)* December 2023 — July 2024

- Proposed a two-stage stochastic decision framework including online acceptance and fulfillment for the omni-channel retailer based on the "buy-online ship-from-store" pattern.
- Derived local and global threshold policies for accepting orders and replenishment in a single-item single-period multi-store setting. Provide theoretical guarantees including quasi-convexity and supermodular properties.
- Employed the IPA algorithm and utilized the dual information to demonstrate sub-optimal threshold settings and solve the fulfillment problem within polynomial time in a multi-item single-period multi-store setting.

**End-to-End Algorithm Implementation for the Full-Link Intelligent Supply Chain.**
*Supervisor: Dongdong Ge (Outstanding Graduation Thesis)* October 2021 — September 2022

- Implemented end-to-end innovative optimization algorithms to solve the demand prediction, inventory management, and replenishment planning in supply chain management.
- Developed a multivariate hierarchical time-series structure and MES_LSTM model for seasonal goods demand forecasts, achieving 72% to 97% prediction accuracy and a 10% reduction in RMSE.
- Designed the customized service level resulting in a 16% reduction in safety stock levels and simulated for soft constraint penalties to gain management insights.

**Acceleration Algorithms for Cardinality Constrained Portfolio Optimization**
*Supervisor: Dongdong Ge* September 2020 — August 2021

- Solved the carnality-constrained mean-variance portfolio optimization problem, which was generally NP-hard. Proposed several heuristic methods, namely, the continuous-relaxation based method the $l_1$-norm based solution, the integer programming based solution and the SDP based solution.
- Evaluated the efficiency and the accuracy of the proposed methods over the commercial MIQP solver on the real-life stock data and the simulated data sets.

## ACADEMIC EXPERIENCES

**Sales Forecast Using Competitive Online Non-Parametric Regression** Cornell University
*Research Assistant* June 2024 — Present

- Conducted the case study and analysed the regression model. Focused on an online learning setting, where our algorithm sequentially predicts the label of a random covariate given past observations.

**Linear and Non-linear Programming** Shanghai University of Finance and Economics
*Teaching Assistant* September 2023 — December 2023

- Answered questions after class ,corrected homework and prepared programming projects. Graded exams and attended weekly TA classes.

## OVERSEAS EXPERIENCE

**Summer Camp at the University of Cambridge** Cambridge, the United Kingdom
*Leader of an Entrepreneurial Project* August 2019 — September 2019

- Led a cross-campus team, Temple Art Cultural and Creative Project, independently raised funding, liaised with investors. Achieved 770,000 followers and generated a 60% profit margin.
- Attended courses, mastered the commercialization of scientific results, and received excellent grades. Prepared a comprehensive report within 24 hours on a voluntary project for children with autism.

## INTERNSHIP EXPERIENCE

**China Merchants Securities Co., Ltd** Shanghai, China
*Financial Analysis* February, 2022 — June, 2022

- Based on financial reports and public websites, independently updated databases of JD.com, Alibaba, and Meituan, including GMV, EBITDA, performance expense ratio, etc.
- By Python data mining and Arena simulation, conducted 37 pages of in-depth reports on Amazon' s operating rules and business monetization topics within two weeks.

## HONORS and AWARDS

- National Scholarship (China's highest honour for top 1% students) September,2023
- Third Prize in the National Undergraduate Mathematical Contest in Modeling October,2022
- Outstanding Graduate of Shanghai University of Finance and Economics June,2022
- Full Scholarship for Summer Study Program at Cambridge August,2018

## SKILLS

- **Language:** IELTS (Academic): 6.5 (Minimum: 6.0)
- **Programming:** Python(Pytorch, TensorFlow, Scikit-learn, Pandas, etc.); C++; LaTeX; SQL; R