Kuo Liang

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RESEARCH INTERESTS

Supply Chain Management; Revenue Management; Large-scale Mixed-Integer Programming Algorithm

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)

PROFESSIONAL EXPERIENCE

Research Assistant Cornell University
Supervisor: Ruihao Zhu July 2024 — Present

- Explored new directions for integrating large language models (LLMs) with operations management. Conducted an in-depth review of relevant literature and developed a comprehensive model library.
- Predicted the label of a random covariate by online non-parametric regression model. Conducted a detailed case study to validate the model's effectiveness and robustness.

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

- Prepared after-class home-works and programming projects. Attended weekly TA classes and provided students with detailed feedback and guidance to help them understand complex concepts.

RESEARCH EXPERIENCE

A Decomposition Framework for Customized Supply-Chain Decisions
Supervisor: Zizhuo Wang (Submitted to MSOM Practice-Based Competition) March 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 sweeping, column selection techniques and distributed algorithm 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 threshold policies for accepting orders and replenishment in a single-item single-period multi-store setting. Provide theoretical guarantees including quasi-convexity and super-modular properties.
- Employed the IPA algorithm and utilized the dual information to obtain the ϵ-optimal threshold solution within poly($\frac{1}{\epsilon}$) steps in a multi-item 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.

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 financial databases of JD.com, Alibaba, and Meituan. 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
- Full Scholarship for Summer Study Program at Cambridge August,2018

SKILLS

- **Language:** IELTS (Academic): 7.0 (Minimum: 6.5)
- **Programming:** Python(Pytorch, TensorFlow, Scikit-learn, Pandas, etc.); C++; LaTeX; SQL; R