# Sichen Guo

**Tel**: (+1)305-269-5639 | sichenguo@bus.miami.edu

## Education

**Shanghai University of Finance and Economics** — Shanghai
*Ph.D. Candidate at School of Management Science and Engineering* — *Sept. 2021 – Jun. 2026 (Expected)*
- Advisor: Chaolin Yang

**University of Miami** — Miami, Florida
*Visiting Ph.D student at Herbert Business School* — *Mar. 2024 – now*
- Advisor: Cong Shi

**Southwestern University of Finance and Economics** — Chengdu
*Bachelor of Applied Mathematics and Economics* — *Sept. 2017 – Jun. 2021*
- National Scholarship

## RESEARCH INTEREST

**Methodologies**: Dynamic Programming, Stochastic Optimization, Data-driven Methods, Online algorithms

**Applications**: Inventory Management, Revenue Management, Game, Human-AI Collaboration

## Papers Under Revision

**An Online Mirror Descent Learning Algorithm for Multiproduct Inventory Systems**
***Sichen Guo**, Cong Shi, Chaolin Yang, Christos Zacharias*
- *Outline*: We consider a multi-product inventory system with inventory capacity constraints, where decision-maker can only observe truncated sales data. We propose an online learning algorithm whose the cumulative regret is sublinear with respect to the number of products and time, improving the dimensional efficiency when compared to previous algorithms.
- Under **Minor Revision** at **Operations Research**

**Robust Allocation Policies for Distribution Systems with Replenishment**
*Liangquan Wang, **Sichen Guo**, Chaolin Yang*
- *Outline*: We developed a robust multi-period inventory model for distribution systems using central-limit-theorem uncertainty sets. By transforming the robust planning problem into an equivalent transportation problem and characterizing Monge sequences, we derived the optimal policy structure under two special conditions and successfully extended these policies to general stochastic environments. Numerical experiments show that our policy outperforms the other benchmark policies from the literature, especially when measured under robust metrics and with real-world demand data.
- Under **Major Revision** at **Manufacturing & Service Operations Management**

## Working Papers

**Switching Gradient: Learning to Compete with Price-Matching Guarantee(JMP)**
***Sichen Guo**, Shukai Li, Cong Shi, Chaolin Yang*
- *Outline*: We analyzed a duopoly pricing game where Price-Matching Guarantees (PMG) create non-convex, discontinuous revenue structures under positive hassle costs, challenging traditional optimization approaches. We proposed a switching gradient learning framework that effectively handles these structural complexities in settings without prior demand knowledge. We proved that our algorithm achieves last-iterate convergence and establishes a dynamic regret bound relative to the optimal dynamic benchmark.
- Initial Manuscript Finished. Target at **Manufacturing & Service Operations Management**

**Asymptotically Optimal Policies for Dual Sourcing System with Service-Level Constraints**
***Sichen Guo**, Nan Liu, Chaolin Yang*
- *Outline*: We investigated optimal ordering policies in dual-sourcing systems with sequential service-level constraints, shifting the focus from traditional cost-driven to service-driven inventory management. We proposed two heuristic strategies tailored to different service-level constraint structures and proved their asymptotic optimality respectively. Numerical experiments demonstrated that our policies achieve superior cost performance compared to classical cost-driven strategies under stringent service-level requirements.
- Initial Manuscript Finished. Target at **Manufacturing & Service Operations Management**

## Book Chapters

**Modern Inventory Management: Models, Algorithms, and Python Implementation**
*China Machine Press, 2024; ISBN 978-7-111-74614-0*

- **Main author** of Demand Forecasting chapter, Section 2 to Section 5, focusing on predictive modeling in inventory management practice and algorithmic implementation in Python

## Grants

**Graduate Innovation Fund**
*Funded by Shanghai University of Finance and Economics*

- **Principal Investigator** for research on dual-sourcing inventory systems with service-level constraints
- Competitively selected from university-wide graduate applicants.

## Conference Presentation

- 2025 INFORMS Annual Meeting
- 2025 INFORMS International Conference
- The 20th International Conference on Service Systems and Service Management
- 2024 INFORMS Annual Meeting
- 2023 POMS International Conference in China

## Teaching

**Mechanism Design** *Summer 2025*

- Instructor: Prof. Zhenyu Hu
- Teaching Assistant. Main responsibilities answering questions, homework grading

**Machine Learning** *Fall 2023*

- Instructor: Prof. Wenting Tu
- Teaching Assistant. Main responsibilities answering questions, homework grading

## Service

- Reviewer for *Management Science, Manufacturing & Service Operations Management, Production and Operations Management, Naval Research Logistics*

## Industry Experience

**RGA Reinsurance Company** Shanghai
*Data Scientist Intern* *2023.07-2023.08*

**Cardinal Operations** Shanghai
*Algorithm Engineer Intern, Supply Chain Department* *2022.05-2022.11*

## Skills & Interests

**Programming Languages**: Java, Python, Matlab, R, SQL

**Interests**: Photography, Cycling, Hiking