Bo Shao

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Research Interests

Methodological: Data-Driven Modeling and Analysis, Operations Research, Stochastic Processes, Optimization.
Application: Production and Operations Systems, Service Systems, Logistics, Supply Chain Management.

Education

University of Wisconsin - Madison   *Sep. 2023 – May. 2025*
Master of Science in Industrial and Systems Engineering

- GPA: 4.0/4.0
- Coursework: Industrial Data Analytics, Applied Temporal Data Analytics, Machine Learning, Decision Making in Health Care, OR-Probabilistic Modeling, Production Systems Control, Stochastic Processes, Integer Optimization.

Logistics Research Center of Fuzhou University   *Jul. 2021 – Aug. 2023*
Research Assistant

Fuzhou University   *Sep. 2017 – Jun. 2021*
Bachelor of Engineering in Logistics Engineering

- GPA: 3.53/4.0 (***Top 10%***).
- Coursework: Statistics, System Simulation, Operations Research, Traffic Engineering, Supply Chain Management.

Publications

- Xiaoli Su, **Bo Shao**, Zhe Yuan & Chenghu Yang. A Data-Driven Distributionally Robust Optimization Approach for Risk-Averse Newsvendor Problem with Demand Censoring. *Annals of Operations Research.* (Under review).

- **Bo Shao**, Xiaoli Su, Xin Li & Xingxuan Zhuo. Mixed-Frequency Data-Driven Forecasting Port Throughput: A Novel Attention-DeepAR-MIDAS Model. *International Journal of Shipping and Transport Logistics.* (In press).

- Xin Li, Yongshi Hu, Xiaoli Su & **Bo Shao***. (2023). A Data-Driven Newsvendor Problem with Shifting Demand: A Deep Autoregressive Model with Attention Mechanism. *Journal of Engineering Science & Technology Review.* 16(3), 74-83. https://doi.org/10.25103/jestr.163.10 ↗.

- Xiaoli Su, Lijun Zeng, **Bo Shao** & Binlong Lin. (2023). Data-Driven Optimization for Production Planning with Multiple Demand Features. *Kybernetes.* https://doi.org/10.1108/K-04-2023-0690 ↗.

- Jianping Zheng & **Bo Shao***. (2022). Throughput Properties and Clustering Analysis of Coastal Ports in China: An Analysis Method by Time Series Complex Network. *DYNA.* 97(4), 398-405. https://doi.org/10.6036/10537 ↗.

Project & Research Experience

Reshoring the U.S. Manufacturing: Analysis of Risks and Capabilities   *Jan. 2024 – Present*
Advisor: Prof. David Ding   *Madison, US*

- Conducted an in-depth literature review on the U.S. manufacturing supply chain reshoring, with a focus on economic, manufacturing, and policy-related factors, and developed a research framework to analyze these dimensions.
- Authored a research report synthesizing findings from both academic and industry sources, and delivered an oral presentation at the 2024 MBAA International Conference in Chicago, IL, engaging with experts from different fields.
- Outcome: **Bo Shao**, David Ding & Yanhui Huang. (2024). *The challenges for the U.S. manufacturing to reshore supply chain.* In 2024 MBAA International Conference, Chicago, IL, United States, April 11, 2024.

Data-Driven Modeling and Optimization for Production and Operations Systems   *Jun. 2023 – Present*

Advisors: Prof. Chenghu Yang (Fuzhou, CN) and Prof. Zhe Yuan (Paris, FR)

- Conducted an extensive literature review on the data-driven newsvendor problem, the production planning problem, and the high-dimensional mixed-frequency approach.
- Conducted numerical experiments to evaluate the performance of the proposed models, analyzing the impact of demand granularity, information processing, demand censoring, and varying levels of risk aversion on order decisions under different conditions.
- Collected and cleaned data for the empirical study, and conducted analyses to validate the practical effectiveness of the data-driven newsvendor model integrated with the Attention-DeepAR method. 🔗
- Developed and analyzed a data-driven optimization model with a rolling cycle, applying the mixed data sampling (MIDAS) technique to address a production problem with multiple demand features. 🔗
- Outcome: Published two academic papers in peer-reviewed journals, with one additional paper currently under review.

Data-Driven Analysis and Forecasting for Port Throughput   *Jul. 2021 – May. 2023*

Advisors: Prof. Chenghu Yang and Prof. Xingxuan Zhuo   *Fuzhou, CN*
Research group: PhD candidate Xiaoli Su and PhD Student Xin Li

- Conducted a literature review on time series forecasting and port economics-related studies to support the development of the forecasting model.
- Collected and cleaned six shipping-related datasets spanning from January 01, 2008 to January 31, 2023, including both high frequency and low frequency indicators.
- Developed the ADM model by integrating the MIDAS and attention mechanism into DeepAR algorithm, and conducted numerical experiments to assess performance in handling mixed-frequency data and prioritizing key variables.
- Conducted time series network analysis of China's 25 largest coastal ports, focusing on hierarchical structures and clustering features of port networks, and applied GIS to visualize their topological characteristics. 🔗
- Outcome: Published two academic papers in peer-reviewed journals.

Teaching Experience

Operations Research   *Sep. 2022 – May. 2023*

Teaching Assistant, Department of Logistics, Fuzhou University   *Fuzhou, CN*

- Undertook teaching assistant workload, including holding office hours for students, and grading homework and quizzes.

Honors & Awards

- 2021 Summa Cum Laude Graduate of Fuzhou University (Top 5%)   *Jun. 2021*
- 2021 Outstanding President Award, Logistics Association, Fuzhou University   *May. 2021*
- 2021 Sci-Tech Innovation Individual Scholarship (Top 3%)   *Apr. 2021*
- 2020 First Prize Scholarship in Major (Top 5%)   *Oct. 2020*
- 2020 SUNSHINE Individual Scholarship (Top 3%)   *Apr. 2020*
- 2019 Third Prize Scholarship in Major (Top 15%)   *Oct. 2019*
- Second Prize in the National Contest On Logistics Design (NCOLD)   *Apr. 2019*
- Second Prize in the 2018 Global Management Challenge (GMC), China Competition   *Jan. 2019*
- Third Prize in the 2018 National College Students Smart Supply Chain Challenge   *Nov. 2018*
- First Prize in the 2018 China University Business Elite Challenge   *Oct. 2018*

Skills & Certificates

Programming Languages: Python, Julia, SQL, C++, R.
Software and Tools: ArcGIS, GeoDa, MATLAB, Origin, AutoCAD, FlexSim, Arena, Stata, SPSS, LaTeX, Tableau.
Certificates: Lean Six Sigma Green Belt Certification; Chinese Logistics Management Certificate of Proficiency.
Hobbies and Activities: Hiking, Running, Road Biking, Cooking, Baking.