Jianing Cao | 曹家宁

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EDUCATION:

The Hong Kong Polytechnic University, Hong Kong, China 09.2024 – Present
QS World University Rankings (2025): 57

- Master of Science in Supply Chain Logistics Management

Kunming University of Science and Technology, Kunming, China 09.2020 - 07.2024
Shanghai Ranking: Academic Ranking of World Universities (2024): 401-500

- Bachelor of Engineering in Mechanical Engineering, GPA: 3.49/4 (Ranking 2/78)

RESEARCH INTERESTS

Operations Research in Urban Transportation

- Electric vehicle charging scheduling optimization
- Charging facility location problem
- Drone-based system application and routing optimization

Operations Research under Uncertainty

- Predict-then-optimize
- Robust optimization

RESEARCH EXPERIENCES

- ***Charging Stations Precise Siting Project of Yunnan Province***

Supervisor: Dr. Nan Pan China Southern Power Grid Co., Ltd.

1. Analyzed the existed layout of charging posts and urban POIs in Kunming
2. Constructed a city charging demand forecasting model through Matlab
3. Constructed a mixed integer programming model for site selection and capacity determination based on bilevel optimization.
4. Identified the expansion plan of urban charging facilities using Python

Paper: **Cao, J.**, Han, Y., Pan, N.*, Zhang, J. & Yang, J. (2024). A data-driven approach to urban charging facility expansion based on bi-level optimization: A case study in a Chinese city. *Energy*. 300, 131529. (JCR Q1)

- ***Supply Chain Logistics Optimization for Power Metering Devices***

Supervisor: Dr. Nan Pan China Southern Power Grid Co., Ltd.

1. Analysis existing power metering devices distribution pattern
2. Developed a mathematics model for power supply bureaus and stations to determine the inventory and optimize the distribution plan
3. Designed a resilience strategy to enhance the reliability in the emergency scenarios
4. Developed a novel heuristics algorithm to solve the established model

Paper: **Cao, J.**, Zhang, M., Pan, N.*, Han, Y., Liu, J., He, Z., & Ai, Z. (2024). Optimization of Three-echelon Logistics Supply Chain Considering Emergency Scenarios Under Resilience Strategy: A Case Study in Power Metering Industry. Computers & Industrial Engineering. (JCR Q1) (Under Second Round Revise-resubmit)

PUBLICATIONS

*: *Corresponding author*

Cao, J., Han, Y., Pan, N.*, Zhang, J. & Yang, J. (2024). A data-driven approach to urban charging facility expansion based on bi-level optimization: A case study in a Chinese city. *Energy*. 300, 131529. (JCR Q1)

Pan, N., Ye, X., **Cao, J.***, Zhang, J., Han, Y. & He, Z. (2023). Optimization of urban emergency support material distribution under major public health emergencies based on improved sparrow search algorithm. *Science Progress*. 106 (2), 003685042311753. (JCR Q2)

Liu, Q., **Cao, J.**, Zhang, J.*, Zhong, Y., Ba, T. & Zhang, Y. (2023). Short-Term Power Load Forecasting in FGSM-Bi-LSTM Networks Based on Empirical Wavelet Transform. *IEEE Access*. 11, 105057–105068. (JCR Q2)

Zhang, J., An, Y.*, **Cao, J.**, Ouyang, S. & Wang, L. (2023). UAV Trajectory Planning for Complex Open Storage Environments Based on an Improved RRT Algorithm. *IEEE Access*. 11, 23189–23204. (JCR Q2)

Han, Y., Xiang, H., **Cao, J.**, Yang, X., Pan, N.* & Huang, L. (2023a). Study on optimization of multi-UAV nucleic acid sample delivery paths in large cities under the influence of epidemic environment. *Journal of Ambient Intelligence and Humanized Computing*. 14 (6), 7593–7620.

Han, Y., Zhang, M., Nan, P.*, **Cao, J.**, Huang, Q., Ye, X. & He, Z. (2023b). Two-stage heuristic algorithm for vehicle-drone collaborative delivery and pickup based on medical supplies resource allocation. *Journal of King Saud University - Computer and Information Sciences*. 35 (10), 101811. (JCR Q1)

Cao, J., Zhang, J., Liu, M., Yin, S. & An, Y.* (2022). Green Logistics of Vehicle Dispatch under Smart IoT. *Sensors and Materials*. 34 (8), 3317. (JCR Q4)

Liu, H., Sun, Y., **Cao, J.**, Chen, S., Pan, N.*, Dai, Y. & Pan, D. (2022). Study on UAV Parallel Planning System for Transmission Line Project Acceptance Under the Background of Industry 5.0. *IEEE Transactions on Industrial Informatics*. 18 (8), 5537–5546. (JCR Q1)

Yang, X., Ye, X., **Cao, J.***, Yan, R., Guo, X. & Huang, J. (2022). High-altitude Inspection Technology of Substation Based on Fusion of Unmanned Aerial Vehicle and Multiple Sensors. *Sensors and Materials*. 34 (8), 3191. (JCR Q4)

WORKING PAPERS

Cao, J., Zhang, M., Pan, N.*, Han, Y., Liu, J., He, Z., & Ai, Z. (2024). Optimization of Three-echelon Logistics Supply Chain Considering Emergency Scenarios Under Resilience Strategy: A Case Study in Power Metering Industry. Computers & Industrial Engineering. (JCR Q1) (Under Second Round Revise-resubmit)

Cao, J.* & Wang, B. (2024). A Robust Predict-then-Optimize Method for Electric Vehicle Charging Scheduling based on Station Charging Status. (In Progress)

PATENTS

昆明理工大学. 一种面向电动汽车充电设施扩建的双层规划方法:CN202410181836.X[P]. 2024-07-05. (发明人: 潘楠, **曹家宁**, 肖仁鑫, 贾现广, 殷实, 吕英英, 韩宇航, 陈世云)

Kunming University of Science and Technology. Double-layer planning method for electric vehicle charging facility extension: CN202410181836.X[P]. 2024-07-05. (Inventor: Pan, N., **Cao, J.**, Xiao, R., Jia, X., Yin, S., Lv, Y., Han, Y., Chen, S.)

昆明理工大学. 一种充电设施物资集群协同调度方法: CN202410130374.9[P]. 2024-05-07. (发明人: 潘楠, 许佳, 张淼寒, **曹家宁**, 韩宇航, 赵峙伟, 肖仁鑫, 贾现广, 殷实, 吕英英)

Kunming University of Science and Technology. Cooperative scheduling method for charging facility material clusters: CN202410130374.9[P]. 2024-05-07. (Inventor: Pan, N., Xu, J., Zhang, M., **Cao, J.**, Han, Y., Zhao, Z., Xiao, R., Jia, X., Yin, S., Lv, Y.)

HONORS AND AWARDS

2024 Outstanding Graduates of Yunnan Province
2024 Finalist for "Top10 Excellent Students of the Year - KUST"
2023 Nominated for "Top10 Excellent Students of the Year - KUST"
2022 Excellence Award in the SINOTRANS Cup-the 7th National Contest on Logistics Design by University Students (NCLDUS)
2022 1st Prize of the undergraduate group in the Yunnan Province of the Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM)
2022 Honorable Mention of the Mathematical Contest in Modeling (MCM)
2022 Gold Award in the 8th China International College Students' 'Internet+' Innovation and Entrepreneurship Competition, Yunnan Province
2021 1st Prize of the undergraduate group in the Yunnan Province of the Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM)
2021 Successful Participant of the Mathematical Contest in Modeling (MCM)
2021 Nominated for ShuWei Cup International Mathematical Contest in Modeling (IMCM)
2021 Excellence Award in the 16th national competition transport science and technology for university students

KUST: Kunming University of Science and Technology

SCHOLARSHIP

2022 Chi Wah* Outstanding Students Scholarship
2022 Chi Wah* Outstanding Social Work Scholarship
2022 Chi Wah* Outstanding Performance Scholarship
2022 Chi Wah* Outstanding Individual Scholarship for Achievement in Advanced Mathematics
2022 2nd Class Scholarship of KUST
2022 Social Work Scholarship of KUST
2022 Innovation and Entrepreneurship Scholarship of KUST
2021 2nd Class Scholarship of KUST

**Chi Wah Awards & Schloarship: from Chi Wah company in HK http://www.hkcwf.org/*

STUDY CERTIFICATE

2023 MIT Blended Learning Live Session Series

2023 MIT Blended Learning Base SPOC (small private online course): Machine Learning Modeling, and Simulation Principles

2022 Oxford Prospects Programme at Regent's Park College, University of Oxford (Module: New Frontiers of Science: Math, Physics, Computer Science and Engineering)