Renlong WANG

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Hint: Full publications and preprints are available at personal website.

Education

University of Chinese Academy of Sciences Beijing, China

Master of Industrial Engineering; GPA: 3.78/4.00 *Sep. 2023 – Jun. 2026*

- Supervisor: Prof. Hong CHI (President of Chinese Society of Optimization, Overall Planning and Economic Mathematics)
- Major Courses: Operations Research, Stochastic Operations Research, Convex Analysis and Optimization, Applied Statistics, Robust Optimization, Introduction of Game Theory

Nanjing Tech University Nanjing, China

Bachelor of Civil Engineering; GPA: 3.69/4.00 *Sep. 2019 – Jun. 2023*

- Distinguished Graduates in Civil Engineering from Jiangsu Universities and Colleges (2023)

Honors & Awards

[1] Outstanding Winner Prize of American Undergraduate Mathematical Contest in Modeling (2022).
  – Top 0.16% among 27,205 teams, America's highest award for mathematical contest in modeling.

[2] SIAM Award of American Undergraduate Mathematical Contest in Modeling (2022).
  – Six teams worldwide designated by The Society for Industrial and Applied Mathematics (SIAM).

[3] National First Prize of Chinese Undergraduate Mathematical Contest in Modeling (2021).
  – Top 0.65% among 45,075 teams, China's highest award for mathematical contest in modeling.

Research Experience

Preference Robust Optimization *Jun. 2024 - Present*

- Proposed a contextual optimization framework for preference robust optimization in multi-attribute group decision-making with attribute interaction (see WORK-IN-PROGRESS [1], sole author). More details can be found in the attached research proposal.

Optimization-Based Multi-Attribute Group Decision-Making *Apr. 2023 - Present*

- Proposed a Generalized Ordinal Priority Approach for decision-making under incomplete preference information. (see PUBLICATION & PREPRINT [1], sole author).
  – Established the fundamental mathematical properties of the Ordinal Priority Approach.
  – Utilized an "estimate-then-optimize" contextual optimization framework for both discrete and continuous prospects considering risk preference.
  – Proved advantageous properties of Generalized Ordinal Priority Approach, including model generalizability, analytical solvability, and risk preference independence.
  – Developed a lower bound reference for transforming the general weight elicitation problem into optimization with stochastic dominance constraints.
  – Provided the extensions of Generalized Ordinal Priority Approach regarding prospect theory, optimization with stochastic dominance constraints, and elicitation errors.
- Proposed a Consensus Ordinal Priority Approach, offering a theoretical foundation for modifying expert consensus based on its information distribution (see PUBLICATION & PREPRINT [2], sole author).
- Proposed a Partial Ordinal Priority Approach to deal with the Pareto optimality, providing a theoretical foundation for partially ordered transformation (see PUBLICATION & PREPRINT [3] and [5]).

Infrastructure Resilience and Safety Management *Jul. 2021 - May 2023*

- Hosted Nation-level Student Research Training Program "Measuring Hospital Resilience at the Nexus of Power-Water-Firefighting-Space (PWFS) System: a Cellular Automata-based Approach", 2022.
- Participated in National Natural Science Foundation of China Youth Program: "The Panoramic Evaluation and Intelligent Improvement of Operational Resilience for Urban Public Service Facilities", 2021 (see PUBLICATION & PREPRINT [6]).

Publications & Preprints

[1] **Wang, R.**, Generalized Ordinal Priority Approach for Multi-Attribute Decision-Making under Incomplete Preference Information, under first-round review of *European Journal of Operational Research*, 2024 (Sole author).

[2] **Wang, R.**, A Hybrid MADM Method Considering Expert Consensus for Emergency Recovery Plan Selection: Dynamic Grey Relation Analysis and Partial Ordinal Priority Approach, published in *Information Sciences*, 2024 (Sole author).

[3] **Wang, R.**, Shen, R., Chi, H., & Gao, M., Partial Ordinal Priority Approach in Multi-Attribute Decision-Making, accepted by *Chinese Journal of Management Science (in Chinese)*, 2024 (First author).

[4] **Wang, R.**, Cui, S., & Gao, M. Systematic Scenario Modeling for Priority Assessment of Sustainable Development Goals in China under Interaction and Uncertainty, published in *Environment, Development and Sustainability*, 2024 (First author).

[5] **Wang, R.**, Shen, R., Cui, S., Chi, H., Shao, X., & Gao, M. Multi-Attribute Decision-Making for Improvisational Emergency Supplier Selection: Partial Ordinal Priority Approach, under second-round review of *Expert System with Applications*, 2023 (First author).

[6] **Wang, R.**, Li, L., Wang, E., & Yuan, J. Measuring Hospital Resilience at the Nexus of Power-Water-Firefighting-Space (PWFS) System: a Cellular Automata-Based Approach, pending submission, 2023 (First author).

[7] Ding, Y., **Wang, R.**, Li, L., Yuan, J., & Shen, L. Safety Risk Assessment and Control of Prefabricated Building Construction Based on BN-MNA Model, published in *Journal of Civil Engineering and Management (in Chinese)*, 2022 (Second author).

[8] Zhou, Y., **Wang, R.**, & She, J. Safety Performance Evaluation of Prefabricated Building Construction from the Perspective of Three Dimensional Space, published in *China Production Safety Science and Technology (in Chinese)*, 2022 (Second author).

Work-in-Progress

[1] Globalized Distributionally Preference Robust Optimization for Multi-Attribute Group Decision Making with Attribute Interaction (Sole author).

[2] A Novel δ-SBM-OPA model for Policy-Driven Analysis of Carbon Emission Efficiency in the Chinese Industrial Sector (with Cui, S., & Li, X.).

[3] Nuclear Energy Technology R&D Portfolio Selection under Uncertainty: Scenario-Based Robust Partial Ordinal Priority approach (with Cui, S., Zhu, F., & Gao, M.).

Summer School & Conference Presentations

2023 International Symposium on Emergency Management *Nov. 2023*

- Debriefed on the topic "Analyzing Heterogeneous Collaboration within Emergency Organizations Based on Emergency Response Plans: a Meta-Network Modeling Framework".
- Best Student Paper Award.

25th Annual Conference on Management Science in China *Oct. 2023*

- Debriefed on the topic "Partial Ordinal Priority Approach in Multi-attribute Decision-making".

2023 POMS Summer School in China *Aug. 2023*

- Debriefed on the topic "Multi-Attribute Decision-Making for Improvisational Emergency Supplier Selection: Partial Ordinal Priority Approach".
- Best Student Paper Award.

Professional Service

Review Services

- *Chinese Journal of Management Science (In Chinese)* (1 time, 2024).
- *Transportation Research Part E: Logistics and Transportation* (1 time, 2023).