BO ZHOU

bozum@umich.edu
1205 Beal Avenue, Ann Arbor, MI 48109
Personal Website ◇ Google Scholar

EMPLOYMENT

Postdoctoral Research Fellow *September 2022 - Present*
Department of Industrial and Operations Engineering
University of Michigan, Ann Arbor, United States
- Faculty co-advisors: Prof. Siqian Shen and Prof. Ruiwei Jiang

EDUCATION

Ph.D., Electrical Engineering *June 2022*
Huazhong University of Science and Technology, Wuhan, China
- Advisor: Prof. Jinyu Wen

B.S., Electrical Engineering and Automation *June 2017*
Huazhong University of Science and Technology, Wuhan, China

RESEARCH AREAS

Theories: Integer programming, robust optimization, convex/non-convex optimization, machine learning

Applications: Power systems, green energy, energy storage, energy market

HONORS AND AWARDS

- Best Student Paper Award, ACPEE 2024, Hong Kong Society of Mechanical Engineers, 2024
- Frontrunner 5000 top article, Institute of Scientific and Technical Information of China, 2023
- University of Michigan Postdoctoral Association Conference Award, University of Michigan, 2023
- National Scholarship for Postgraduate, Ministry of Education, China, 2020
- Excellent Paper Award, iSPEC 2019, IEEE Power & Energy Society, 2019

PUBLICATIONS

Papers in Optimization & Learning

[1] **Bo Zhou**, Ruiwei Jiang, Siqian Shen, "Submodularity and Supermodularity in Min-Cost Flow Interdiction," in preparation.

[2] **Bo Zhou**, Ruiwei Jiang, Siqian Shen, "Bilevel Mixed-Integer Linear Program with Binary Tender," submitted, 2025. [arXiv]

[3] **Bo Zhou**, Ruiwei Jiang, Siqian Shen, "Learning to solve bilevel programs with binary tender," *the 12th International Conference on Learning Representation (**ICLR**)*, Vienna, Austria, May, 2024. [Link]

[4] Yanru Guo, **Bo Zhou**, Ruiwei Jiang, Siqian Shen, Xi (Jessie) Yang, "Distributionally robust resource allocation with trust-aided parametric information fusion," in *Proceedings of the 63rd IEEE Conference on Decision and Control (**CDC**)*, Milan, Italy, December 2024. [Link]

[5] Wenjia Shen, **Bo Zhou**, Ruiwei Jiang, Siqian Shen, "Sequential charging station location optimization under uncertain charging behavior and user growth," in *Proceedings of the 63rd IEEE Conference on Decision and Control (**CDC**)*, Milan, Italy, December 2024. [Link]

Selected Papers in Energy System Operations

[1] Mohammad Rajabdorri, **Bo Zhou**, Lukas Sigrist, Enrique Lobato, "Implementing General-Order Frequency Dynamic Response Model and Frequency Excursion Duration Criterion in Unit Commitment Problem," submitted, 2025. [arXiv]

[2] Huang Zhou, Shichang Cui, Jiye Wang, Kun Li, Lishen Wei, **Bo Zhou**, Xiaomeng Ai, Jiakun Fang, Jinyu Wen, "Robust Wind Farm Frequency Support for Rapid and Reliable Load Restoration Under Decision-Dependent Uncertainty," submitted, 2025. [SSRN]

[3] Yu-Yang Tang, Liang Chen, Sheng-Jie Chen, Yu-Hong Dai, **Bo Zhou**, Xiaomeng Ai, "A Dynamic Relaxation Framework for Global Solution of ACOPF Problem," submitted, 2025. [arXiv]

[4] Menglin Zhang, Jian Gong, Xiaofei Wang, Qiuwei Wu, **Bo Zhou**, Fangxing Li, Jinyu Wen, "Coordinated Scheduling of Virtual Power Plants Driven by Unbalanced Distribution LMP," ***IEEE Transactions on Smart Grid***, under 3rd review, 2025.

[5] Menglin Zhang, Sheng Cai, Yunyun Xie, **Bo Zhou**, Weiye Zheng, Qiuwei Wu, Jinyu Wen, "Supply resilience constrained scheduling of MERs for distribution system restoration: A stochastic model and FW-PH algorithm," ***IEEE Transactions on Smart Grid***, 16(01), 194-2087, 2025. [Link]

[6] Xiaomeng Ai, Huang Zhou, Jun Zhou, **Bo Zhou**, Shichang Cui, Jiakun Fang, Jinyu Wen, "Multi-Week Continuous-Time Scheduling of Integrated Electricity and Natural Gas System Against Long-Lasting Stressful Weather," ***Applied Energy***, 383, 125305, 2025. [Link]

[7] **Bo Zhou**, Ruiwei Jiang, Siqian Shen, "Frequency stability-constrained unit commitment: Tight approximation using Bernstein polynomials," ***IEEE Transactions on Power Systems***, 39(04), 5907-5919, 2024. [Link]

[8] **Bo Zhou**, Xiaomeng Ai, Jiakun Fang, Kun Li, Wei Yao, Zhe Chen, Jinyu Wen, "Function-space optimization to coordinate multi-energy storage across the integrated electricity and natural gas system," ***International Journal of Electrical Power & Energy System***, 2023(151), 109181, 2023. [Link]

[9] **Bo Zhou**, Jiakun Fang, Xiaomeng Ai, Yipu Zhang, Wei Yao, Zhe Chen, Jinyu Wen, "Partial-dimensional correlation-aided convex-hull uncertainty set for robust unit commitment," ***IEEE Transactions on Power Systems***, 38(03), 2434-2446, 2023. [Link]

[10] **Bo Zhou**, Jiakun Fang, Xiaomeng Ai, Shichang Cui, Wei Yao, Zhe Chen, Jinyu Wen, "Storage right-based hybrid discrete-time and continuous-time flexibility trading between energy storage station and renewable power plants," ***IEEE Transactions on Sustainable Energy***, 14(01), 465-481, 2023. [Link]

[11] Menglin Zhang, Qiuwei Wu, Jinyu Wen, **Bo Zhou**, Qingyue Guan, Jin Tan, Zhongwei Lin, Fang Fang, "Day-ahead stochastic scheduling of integrated electricity and heat system considering reserve provision by large-scale heat pumps," ***Applied Energy***, 307, 118143, 2022. [Link]

[12] **Bo Zhou**, Jiakun Fang, Xiaomeng Ai, Wei Yao, Jinyu Wen, "Flexibility-enhanced continuous-time scheduling of power system under wind uncertainties," ***IEEE Transactions on Sustainable Energy***, 12(04), 2306-2320, 2021. [Link]

[13] **Bo Zhou**, Jiakun Fang, Xiaomeng Ai, Chengxiang Yang, Wei Yao, Jinyu Wen, "Dynamic Var reserve-constrained coordinated scheduling of LCC-HVDC receiving-end system considering contingencies and wind uncertainties," ***IEEE Transactions on Sustainable Energy***, 12(01), 469-481, 2021. [Link]

[14] Menglin Zhang, Jiakun Fang, Xiaomeng Ai, **Bo Zhou**, Wei Yao, Qiuwei Wu, Jinyu Wen, "Partition-combine uncertainty set for robust unit commitment," ***IEEE Transactions on Power Systems***, 35(04), 3266-3269, 2020. [Link]

[15] **Bo Zhou**, Xiaomeng Ai, Jiakun Fang, Wei Yao, Jinyu Wen, "Continuous-trajectory robust unit commitment considering beyond-the-resolution uncertainty," in *Proceedings of the 2020 IEEE Power & Energy Society General Meeting (**PESGM**)*, Montreal, Canada, August 2020. [Link]

[16] **Bo Zhou**, Jiakun Fang, Xiaomeng Ai, Menglin Zhang, Wei Yao, Zhe Chen, Jinyu Wen, "Linear network model for integrated power and gas distribution systems with bidirectional energy conversion," ***IET Renewable Power Generation***, 14(17), 3284-3291, 2020. [Link]

[17] **Bo Zhou**, Jiakun Fang, Xiaomeng Ai, Wei Yao, Zhe Chen, Jinyu Wen, "Pyramidal approximation for power flow and optimal power flow," ***IET Generation, Transmission & Distribution***, 14(18), 3774-3782, 2020. [Link]

[18] **Bo Zhou**, Xiaomeng Ai, Jiakun Fang, Wei Yao, Wenping Zuo, Zhe Chen, Jinyu Wen, "Data-adaptive robust unit commitment in the hybrid AC-DC power system," ***Applied Energy***, 254, 113784, 2019. [Link]

PRESENTATIONS

Invited Talks

[1] "Sequential Charging Station Location Optimization under Uncertain Charging Behavior and User Growth," *2024* ***INFORMS Annual Meeting***, Seattle, United States, October, 2024.

[2] "Power System Flexibility Trading through Bilevel Optimization," School of Electrical, Computer, and Biomedical Engineering, *Southern Illinois University*, Carbondale, United States, October, 2024.

[3] "Risk-Averse Reinforcement Learning for Real-Time Economic Dispatch," *2023* ***INFORMS Annual Meeting***, Seattle, United States, October, 2023.

[4] "Frequency Stability-Constrained Unit Commitment: Tight Approximation using Bernstein Polynomials," *2023* ***INFORMS Annual Meeting***, Phoenix, United States, October, 2023.

[5] "Differential algebraic equation-constrained frequency-secured stochastic unit commitment," *SIAM Conference on Optimization (**SIAM OP23**)*, Seattle, United States, June, 2023.

Conference Presentations and Posters

[1] "Learning to Solve Bilevel Programs with Binary Tender," *Midwest Optimization & Statistical Learning Conference (**MOSL**)*, Evanston, IL, May, 2025.

[2] "Learning to Solve Bilevel Programs with Binary Tender," *the 12th International Conference on Learning Representation (**ICLR**)*, Vienna, Austria, May, 2024.

[3] "Differential Algebraic Equation-constrained Frequency-secured Stochastic Unit Commitment," *2023 IEEE Power & Energy Society General Meeting (**PESGM**)*, Orlando, United States, July, 2023.

[4] "Continuous-trajectory robust unit commitment considering beyond-the-resolution uncertainty," *2020 IEEE Power & Energy Society General Meeting (**PESGM**)*, Montreal, Canada, August, 2020.

[5] "Steady state security region considering post contingency cascaded DC commutation failure," *2019 IEEE Sustainable Power and Energy Conference (**iSPEC**)*, Beijing, China, November, 2019.

TEACHING

Mentoring

Department of Industrial and Operations Engineering, University of Michigan, Ann Arbor

[1] **Wenjia Shen**, visiting master's student from Nanjing University, Fall 2023 - Fall 2024
Main tasks: Advising Wenjia to prepare models and numerical results for her paper that was published in the Proceedings of *the 63rd IEEE Conference on Decision and Control (CDC 2024)*.

[2] **Yanru Guo**, master's student (currently a PhD student at UMich), Fall 2022 - Spring 2024
Main tasks: Helping Yanru with formulation setup and preparing instances for her paper that was presented as an invited talk "Trust-Aided Distributionally Robust Resource Allocation with Multi-Source Reference Information" in the *2023 INFORMS Annual Meeting*, and as her paper that was published in the Proceedings of the *the 63rd IEEE Conference on Decision and Control (CDC 2024)*.

School of Electrical and Electronic Engineering, Huazhong Uni. of Science and Technology, Wuhan, China

[3] **Huang Zhou**, PhD student, Fall 2022 - Spring 2025
Main tasks: Advising Huang in optimization theory, model formulation, coding, experiment design, and thesis writing during his undergraduate thesis titled "Continuous-time Unit Commitment Considering Interruptible Load" and helping him with model reformulation, algorithm design, and paper writing to expand the work as a journal paper that was published in *Applied Energy*.

SERVICES

Peer Reviewer for Journals and Conferences

- *Power and Energy Systems*:
IEEE Transactions on Power Systems | IEEE Transactions on Sustainable Energy
IEEE Transactions on Smart Grid | IEEE Transactions on Energy Markets, Policy and Regulation
IEEE Power Engineering Letters | IEEE Power & Energy Society General Meeting (2019 – 2025)
IEEE Transactions on Transportation Electrification | Sustainable Energy, Grids and Networks
Applied Energy | Energy Conversion and Management | Energy | Global Energy Interconnection
CSEE Journal of Power and Energy Systems | IET Generation, Transmission & Distribution
- *Operations Research*:
INFORMS Journal on Computing | IISE Transactions

PROFESSIONAL

Professional Affliations

- Institute of Electrical and Electronics Engineers (IEEE), Member, 2019 – present
- Institute for Operations Research and the Management Sciences (INFORMS), Member, 2022 – present

PROJECT EXPERIENCE

Project Participation

[1] Theories and Computational Algorithms for Optimizing Bilevel Mixed-Integer Nonlinear Programs
Funded by U.S. Air Force Office of Scientific Research *Sep. 2023 - present*

[2] Extreme-Scale Stochastic Optimization via Learning-enhanced Decomposition and Parallelization
Funded by U.S. Department of Energy *Sep. 2022 - Aug. 2023*

[3] Adaptive Extreme Scenario Method for Unit Commitment with Wind Power Ramp Event
Funded by National Natural Science Foundation of China *Jan. 2018 - Dec. 2020*

[4] Robust Coordinated Planning of Energy Storage in Integrated Electricity and Natural Gas System
Funded by National Natural Science Foundation of China *Jan. 2018 - Dec. 2020*

[5] Configuration Optimization and Control Strategy of Energy Storage Stations for the Power System
Funded by State Grid Corporation of China *Jan. 2018 - Dec. 2019*

Proposal Writing

[1] Wildfire-Resilient Electric Power Grids
Submitted to the FIRE Program of U.S. National Science Foundation
Role: Helping the PI to prepare literature review and research descriptions.

[2] Bilevel Program with Ambiguous Followers
Submitted to the Operations Engineering Program of U.S. National Science Foundation
Role: Helping the PI to prepare the initial draft including research descriptions and preliminary results.

[3] Theories and Computational Algorithms for Optimizing Bilevel Mixed-Integer Nonlinear Programs
Funded by U.S. Air Force Office of Scientific Research
Role: Helping the PI to prepare literature review and figures used in the proposal.