Yufan Zhang

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Employment

ISO New England June 2025 - Present
Martket & Optimization Scientist

Cornell University Jan. 2025 - June 2025
Postdoctoral Associate
College of Engineering

University of California San Diego Jan. 2023 - Jan. 2025
Postdoctoral Researcher
Department of Electrical and Computer Engineering

Education

Shanghai Jiao Tong University (SJTU) Sep 2017 - Aug 2022
Ph.D. in Electrical Engineering
Mentor: Prof. Qian Ai

Chongqing University (CQU) Sep 2013 - Jun 2017
Bachelor in Electrical Engineering

Fellowship

- SJTU Outstanding Doctoral Graduate Development Fellowship 2022

Awards and Scholarship

- 2024 CNKI Highly Cited Scholars Top 1% 2025
- LANL Grid Science Winter School Scholarship 2024
- Rising Stars in EECS, MIT 2024
- Rising Stars in Cyber-Physical Systems, The University of Virginia 2024
- Top Articles in Outstanding S&T Journals of China 2022
- Frontrunner 5000 Paper in China 2022
- SJTU Outstanding Ph.D. Graduate 2022
- SJTU Outstanding Ph.D. Student Scholarship 2020
- Best Conference Paper, IEEE Power & Energy Society General Meeting 2020
- SJTU Sieyuan Electrics Co. Scholarship 2019
- CQU Outstanding Undergraduate 2017
- Undergraduate National Scholarship, Chinese Ministry of Education 2016
- China Yangtze Power Co. Scholarship, 2014
- CQU Freshmen Scholarship 2013

Selected Publications

Current h-index: 13 (Google Scholar)

Submitted

[S1] **Y. Zhang** and F. You, "Offering reserve capacity to renewable-rich power systems can cut plant factory energy costs by up to 87%," 2025, *Submitted to Cell Reports Sustainability.*

[S2] **Y. Zhang**, H. Wen, Y. Bian, and Y. Shi, "Improving sequential market coordination via value-oriented renewable energy forecasting," 2024, *Submitted to IEEE Transactions on Energy Markets, Policy, and Regulation.* [Online]. Available: https://arxiv.org/abs/2405.09004.

[S3] **Y. Zhang**, H. Wen, Y. Bian, and Y. Shi, "Deriving loss function for value-oriented renewable energy forecasting," 2023, *Submitted to Power Systems Computation Conference*. [Online]. Available: https://arxiv.org/pdf/2310.00571.pdf.

Journal Publications

[J1] **Y. Zhang**, M. Jia, H. Wen, Y. Bian, and Y. Shi, "Toward value-oriented renewable energy forecasting: An iterative learning approach," *IEEE Transactions on Smart Grid*, 2024. [Online]. Available: https://arxiv.org/pdf/2309.00803.pdf.

[J2] **Y. Zhang**, H. Wen, T. Feng, and Y. Chen, "Efficient demand response location targeting for price spike mitigation by exploiting price-demand relationship," *Appled Energy*, 2024. [Online]. Available: https://arxiv.org/pdf/2211.14806.pdf.

[J3] **Y. Zhang**, S. Dey, and Y. Shi, "Optimal vehicle charging in bilevel power-traffic networks via charging demand function," *IEEE Transactions on Smart Grid*, 2023. [Online]. Available: https://arxiv.org/pdf/2304.11284.pdf.

[J4] **Y. Zhang**, H. Wen, and Q. Wu, "A contextual bandit approach for value-oriented prediction interval forecasting," *IEEE Transactions on Smart Grid*, 2023. [Online]. Available: https://arxiv.org/pdf/2210.04152.pdf.

[J5] **Y. Zhang**, H. Wen, Q. Wu, and Q. Ai, "Optimal adaptive prediction intervals for electricity load forecasting in distribution systems via reinforcement learning," *IEEE Transactions on Smart Grid*, 2022. [Online]. Available: https://arxiv.org/pdf/2205.08698.pdf.

[J6] **Y. Zhang**, Q. Wu, Q. Ai, and J. P. Catalão, "Closed-loop aggregated baseline load estimation using contextual bandit with policy gradient," *IEEE Transactions on Smart Grid*, vol. 13, no. 1, pp. 243–254, 2021. [Online]. Available: https://web.fe.up.pt/~catalao/9536962.pdf.

[J7] **Y. Zhang**, Q. Ai, F. Xiao, R. Hao, and T. Lu, "Typical wind power scenario generation for multiple wind farms using conditional improved wasserstein generative adversarial network," *International Journal of Electrical Power & Energy Systems*, vol. 114, p. 105 388, 2020. [Online]. Available: https://www.sciencedirect.com/science/article/abs/pii/S0142061519305010.

[J8] S. Yin, Q. Ai, Z. Li, **Y. Zhang**, and T. Lu, "Energy management for aggregate prosumers in a virtual power plant: A robust stackelberg game approach," *International Journal of Electrical Power & Energy Systems*, vol. 117, p. 105 605, 2020. [Online]. Available: https://www.sciencedirect.com/science/article/abs/pii/S0142061519320125.

[J9] **Y. Zhang**, Q. Ai, H. Wang, Z. Li, and K. Huang, "Bi-level distributed day-ahead schedule for islanded multi-microgrids in a carbon trading market," *Electric power systems research*, vol. 186, p. 106 412, 2020. [Online]. Available: https://www.sciencedirect.com/science/article/abs/pii/S0378779620302182.

[J10] **Y. Zhang**, Q. Ai, and Z. Li, "Admm-based distributed response quantity estimation: A probabilistic perspective," *IET Generation, Transmission & Distribution*, vol. 14, no. 26, pp. 6594–6602, 2020. [Online]. Available: https://ietresearch.onlinelibrary.wiley.com/doi/full/10.1049/iet-gtd.2020.1380.

[J11] **Y. Zhang**, Q. Ai, H. Wang, Z. Li, and X. Zhou, "Energy theft detection in an edge data center using threshold-based abnormality detector," *International Journal of Electrical Power & Energy Systems*, vol. 121, p. 106 162, 2020. [Online]. Available: https://www.sciencedirect.com/science/article/abs/pii/S0142061519322768.

[J12] **Y. Zhang**, Q. Ai, and Z. Li, "Grouping of dynamic electricity consumption behaviour: An f-divergence based hierarchical clustering model," *IET Generation, Transmission & Distribution*, vol. 15, no. 22, pp. 3164–3175, 2021. [Online]. Available: https://ietresearch.onlinelibrary.wiley.com/doi/full/10.1049/gtd2.12248.

[J13] **Y. Zhang**, Q. Ai, and Z. Li, "Intelligent demand response resource trading using deep reinforcement learning," *CSEE Journal of Power and Energy Systems*, vol. 10, no. 6, pp. 2621–2630, 2024. [Online]. Available: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9535402.

[J14] **Y. Zhang**, Q. Ai, Z. Li, *et al.*, "Data augmentation strategy for small sample short-term load forecasting of distribution transformer," *International Transactions on Electrical Energy Systems*, vol. 30, no. 7, e12209, 2020. [Online]. Available: https://onlinelibrary.wiley.com/doi/abs/10.1002/2050-7038.12209.

[J15] Z. Li, H. Wang, Q. Ai, and **Y. Zhang**, "Interactive optimization between active distribution network with multi-microgrids based on distributed algorithm," *Energy Reports*, vol. 6, pp. 385–391, 2020.

[J16] **Y. Zhang**, Q. Ai, and Z. Li, "Improving aggregated baseline load estimation by gaussian mixture model," *Energy Reports*, vol. 6, pp. 1221–1225, 2020.

Conference Publications

[C1] **Y. Zhang**, J. Han, and Y. Shi, "Risk-aware value-oriented net demand forecasting for virtual power plants," *NAPS 2024: 56th North American Power Symposium*, 2024. [Online]. Available: https://arxiv.org/pdf/2406.10434.

[C2] X. He, H. Wen, **Y. Zhang**, Y. Chen, and D. H. Tsang, "Fast unit commitment constraint screening with learning-based cost model," in *2024 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*, IEEE, 2024, pp. 295–300. [Online]. Available: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=10738113.

[C3] X. He, J. Tian, **Y. Zhang**, H. Wen, and Y. Chen, "Fast constraint screening for multi-interval unit commitment," in *2023 62nd IEEE Conference on Decision and Control (CDC)*, IEEE, 2023, pp. 577–583. [Online]. Available: https://arxiv.org/pdf/2309.05894.pdf.

Services and Activities

Reviewers:

- **Journal**: IEEE Transactions on Industrial Informatics, IEEE Transactions on Power Systems, IET Renewable Power Generation, Applied Energy, Energy Reports, Sustainable Energy, Grids and Networks, IEEE Open Access Journal of Power and Energy, Energy & Building, Heliyon, European Journal of Operational Research, Protection and Control of Modern Power Systems, IEEE Transactions on Industry Applications, Engineering Applications of Artificial Intelligence, IEEE Transactions on Energy Markets, Policy and Regulation, International Journal of Electrical Power and Energy Systems, Renewable & Sustainable Energy Reviews, Results in Control and Optimization
- **Conference**: IEEE Power & Energy Society General Meeting, Power Systems Computation Conference, North American Power Symposium (NAPS)

Professional Society Service:

- Co-organizer of Power & Energy Seminar Series at UC San Diego

Service Related to Diversity, Equity, Inclusion:

- Co-organizer for Workshop on "Let's Build a Wind Turbine" at Girl's Day Out.
- Member, Women in ECE (WeCe)

Teaching Experience

Courses

ECE 228: Machine Learning for Physical Applications — UC San Diego
Co-instructor — Spring quarter 2024

MAE 243: Electric Power Systems Modeling — UC San Diego
Guest lecturer — Fall quarter 2023

Supervision Experience

1. Jiajun Han, Value-oriented forecasting for risk-manageable operation. *M.Sc. student* — Fall quarter 2023

2. Yuexin Bian, Optimal arrival scheduling of electric vehicles. *Ph.D. student with UCSD* Summer quarter 2023
3. Zhaoyu Li, Power-gas network equilibrium: a potential game perspective. *Ph.D. student with SJTU* 2022

Teaching Training

1. Pathways to Scientific Teaching Winter quarter 2024
2. Fundamental teaching workshop Winter quarter 2024

Invited Talks and Presentation

Invited Talks

[T1] *Power systems under renewable uncertainty: How decision-focused forecasting drives cost reduction*, University of Minnesota Duluth, 2025. Hosted by Department of Electrical Engineering. February, 2025.

[T2] *Ai-powered sustainable electricity markets: How forecasting drives cost reduction?* Cornell University, 2024. Hosted by Prof. Fengqi You. October, 2024.

[T3] *Value-oriented renewable energy forecasting for sequential electricity market clearing*, 2024. SIGEnergy Graduate Student Seminar. July, 2024.

[T4] *Deriving closed-form loss function for value-oriented renewable energy forecasting*, University of California San Diego, 2024. Presented at Power & Energy Seminar Series. January, 2024.

[T5] *Optimal vehicle charging in bilevel power-traffic networks via charging demand function*, Columbia University, 2023. Hosted by Prof. Bolun Xu. April, 2023.

[T6] *Value-oriented forecasting for power systems*, University of California San Diego, 2023. Presented at Power & Energy Seminar Series. Februrary, 2023.

Conferences & Workshops

[T7] *Value-oriented renewable energy forecasting for sequential electricity market clearing*, 2025 Grid Science Winter School and Conference, Los Alamos National Laboratory, January, 2025.

[T8] *Redesigning forecasting products for renewable integration by decision-focused learning*, EECS Rising Stars 2024 Workshop, MIT, October, 2024.

[T9] *A contextual bandit approach for value-oriented prediction interval forecasting*, 2024 INFORMS Annual Meeting, October, 2024.

[T10] *Value-oriented renewable energy forecasting*, 2024 INFORMS Annual Meeting, October, 2024.

[T11] *Value-oriented renewable energy forecasting for sequential electricity market clearing*, The Seventh Workshop on Autonomous Energy Systems. National Renewable Energy Laboratory, September, 2024.

[T12] *Value-oriented renewable energy forecasting for sequential electricity market clearing*, 2024 IEEE Power & Energy Society General Meeting, July, 2024.

[T13] *Redesigning forecasting products for renewable integration by decision-focused learning*, CPS Rising Stars 2024 Workshop,The University of Virginia, May, 2024.

[T14] *Optimal vehicle charging in bilevel power-traffic networks via charging demand function*, 2023 INFORMS Annual Meeting, October, 2023.

[T15] *Demand response model identification and forecasting with differentiable optimization neural network (optnet): A gradient-based approach*, 2023 IEEE Power & Energy Society General Meeting, July, 2023.

[T16] *Closed-loop aggregated load estimation*, 2023 IEEE Power & Energy Society General Meeting, July, 2023.

[T17] *Improving aggregated load forecasting using evidence accumulation k-shape clustering*, 2020 IEEE Power & Energy Society General Meeting, August, 2020.

Technical Strength

Background: Power Systems, Machine Learning, Optimization.
Programming Language and Software: Python (proficient), Matlab (proficient), Gurobi (proficient), SQL, C++.