

Chao Shen

12232047@zju.edu.cn | (+86) 198 5713 8053

Zhejiang University, Hangzhou, Zhejiang, China 310027

Education

Zhejiang University, College of Control Science and Engineering Sep 2022 – Present

- Ph.D. Candidate in Control Science and Engineering (GPA: 3.90/4.0)
- Supervisor: [Mingyang Sun](#), Professor at Peking University, Honorary Lecturer at Imperial College London; [Peng Cheng](#), Professor at Zhejiang University

Peking University, College of Engineering Jul 2024 – Present

- Visiting Ph.D. Student of Intelligent DEcision-mAking for Low Carbon Energy Systems Laboratory ([IDEAL Lab](#))
- Supervisor: [Mingyang Sun](#), Professor at Peking University, Honorary Lecturer at Imperial College London

Huazhong University of Science and Technology, School of Civil and Hydraulic Engineering Sep 2018 – Jun 2022

- B.Eng. in Hydraulic and Hydropower Engineering (GPA: 3.96/4.0)
- Supervisor: [Hui Qin](#), Professor at Huazhong University of Science and Technology

Research Interests

My research focuses on the integration of artificial intelligence with power and energy systems, with emphasis on large language models, reinforcement learning, power system dynamic security analysis, optimal topology reconfiguration, and optimal power flow. I am currently working on foundation-model-based methods for power system modeling, simulation, optimization, and decision-making, as well as domain-specific benchmark construction and evaluation protocols for reliable AI in power systems.

Publications

- C. Shen, K. Zuo, M. Sun, “[Universal Transient Stability Analysis: A Pre-trained Generative Transformer-enabled Power System Dynamics Prediction Framework](#)”, Applied Energy, 2026.
- C. Shen, Z. Guo, X. Wan, Z. Yang, Y. Zhang, W. Huang, J. Song, Z. Zhang, M. Sun, “[ProOPF: Benchmarking and Improving LLMs for Professional-Grade Power Systems Optimization Modeling](#)”, International Conference on Machine Learning (ICML), 2026.
- C. Shen, Z. Guo, K. Zuo, W. Huang, M. Sun, “[LLM-DMD: Large Language Model-based Power System Dynamic Model Discovery](#)”, IEEE Transactions on Industrial Informatics, 2026.
- C. Shen, K. Zuo, M. Sun, “[Physics-Augmented Auxiliary Learning for Power System Transient Stability Assessment](#)”, IEEE Transactions on Industrial Informatics, 2025.
- C. Shen, K. Zuo, M. Sun, “[Physics-Following Neural Network for Online Dynamic Security Assessment](#)”, IEEE Transactions on Power Systems, 2025. ESI Highly Cited Paper (Engineering).
- C. Shen, F. Sun, H. Chen, Y. Lin, C. Guo, M. Sun, “[Carbon-NeuGC: Neural Granger Causality Based Attribution Analysis of Power System Carbon Intensity](#)”, China Automation Congress (CAC), 2024.
- Z. Zhang, C. Shen, X. Wan, J. Song, M. Sun, “[LLM-Guided Safe Reinforcement Learning for Energy System Topology Reconfiguration](#)”, Applied Energy, 2026.
- K. Zuo, C. Shen, P. Cheng, J. Song, M. Sun, “[Probabilistic Robustness Verified Data-Driven Transient Security-Constrained Optimal Power Flow](#)”, IEEE Transactions on Power Systems, 2025.
- J. Shao, C. Shen, Z. Guo, Y. Huang, M. Sun, “[Workload Reshaping and Waste Heat Valorization for Token Cost Reduction in Large Model Datacenters: A Two Stage Forecasting and Optimization Framework](#)”, Applied Energy, Under Review, 2026.
- Z. Li, Z. Guo, X. Lu, J. Wang, J. Song, C. Shen, J. Wu, M. Sun, “[OptArgus: A Multi-Agent System to Detect Hallucinations in LLM-based Optimization Modeling](#)”, NeurIPS, Under Review, 2026.
- X. Wang, F. Tang, Y. Wei, Y. He, Z. Liu, P. Jiang, H. Wu, Z. Guo, C. Shen*, “A Novel Method for

Differential-Algebraic Dynamic Model Discovery in Power Systems: An LLM-Based Multi-Agent Collaborative Framework”, IET Renewable Power Generation, Under Review, 2026.

*Corresponding author.

Patents

- M. Sun, C. Shen, Z. Guo, Z. Zhang, X. Huang, J. Song, "Method, Apparatus, and Equipment for Constructing Power System Models Based on Large Language Models", CN Patent Application No. 202512030361.1, filed Dec. 30, 2025, Pending.
- C. Shen, M. Sun, C. Guo, Y. Lin, F. Sun, Y. Lin, "A Data-Mechanism Joint-Driven Multidimensional Granger Causality Attribution Method for Carbon Emissions", CN Patent Application No. 202311496211.4, Pending.
- C. Shen, Y. Ruan, M. Sun, C. Zhao, R. Ma, R. Chen, A Semi-Supervised Driving Range Estimation and Driving Behavior Analysis Method Combined with Mechanism, CN Patent Application No. 202410920530.1, Pending.

Selected Honours and Awards

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| • Web of Science ESI Highly Cited Paper (Engineering) for PFNN | 2026.02 |
| • Outstanding Graduate Student, Zhejiang University | 2025.11 |
| • Second Prize, The China Graduation Contest on Smart-City Technology and Creative Design | 2023.04 |
| • Outstanding Graduates Award of Huazhong University of Science and Technology | 2022.06 |
| • China National Scholarship | 2021.10 |
| • Finalist Award Mathematics Contest In Modeling (Top 2%) | 2021.04 |
| • First Prize, The Chinese Mathematics Competitions (Top 8%) | 2020.01 |

Academic Service

Invited reviewer for IEEE Transactions on Power Systems, IEEE Transactions on Smart Grid, Applied Energy, International Journal of Electrical Power & Energy Systems, and Electric Power Systems Research.