

Zhengkao Zhou

PERSONAL INFORMATION

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EDUCATION EXPERIENCES

M.S. Electrical Engineering 2024-present

Shanghai Jiao Tong University, Shanghai, China

College of Smart Energy

GPA: 3.89/4.0 (Ranking: 2/44, **National Scholarship**)

Advisor: Yiyan Li, Associate Professor

B.S. Electrical Engineering 2020-2024

Hunan University, Changsha, China

GPA: 3.83/4.0 (Ranking: 3/289, **National Scholarship**)

RESEARCH INTEREST

My research focuses on the application of **machine learning** and **big data analytics** in **power distribution systems**, including:

- **Synthetic Data Generation:** using deep-learning based methods to synthesize useful data for power system analysis. For example, using infoGAN model to extract interpretable physical features and enabling controlled data generation
- **Physics-Informed Modeling:** using machine-learning based methods to model power systems with interpretability. For example, using Kolmogorov-Arnold Network to implement white-box modeling of electrical energy systems.
- **Energy Data Asset Protection:** using watermarking technology to verify the ownership for dataset or neural network. For example, using backdoor watermark to protect the well-trained neural network.
- **LLM-based data analytics:** using fine-tuned LLM to time series analysis in power system. For example, proposing a unified causal supervised LLM-based framework to different tasks.

PUBLICATIONS

[1] **Zhengkao Zhou**, Yiyan Li*, Runlong Liu, Zheng Yan, Mo-Yuen Chow. Unsupervised and

controllable synthesizing for imbalanced energy dataset based on AC-InfoGAN[J]. Applied Energy, 2025, 393: 126107.

- [2] **Zhenghao Zhou**, Yiyang Li*, Zelin Guo, Zheng Yan, Mo-Yuen Chow. A White-Box Deep-Learning Method for Electrical Energy System Modeling Based on Kolmogorov-Arnold Network. (IEEE Transactions on Industrial Informatics, Accepted)
- [3] **Zhenghao Zhou**, Yiyang Li*, Xinjie Yu, Jian Ping, Xiaoyuan Xu, Zheng Yan, Mohammad Shahidehpour. Deep-Learning Neural Network-based Frequency-Domain Watermarking for Power System Time Series Data Asset Ownership Verification. (Submitted to Applied Energy)
- [4] Yiyang Li, **Zhenghao Zhou**, Jian Ping, Xiaoyuan Xu, Zheng Yan*, Jianzhong Wu. A Two-Stage AI-Powered Motif Mining Method for Efficient Power System Topological Analysis. (Submitted to Applied Energy)
- [5] **Zhenghao Zhou**, Yiyang Li*, Runlong Liu, Zheng Yan, Mo-Yuen Chow. DNN-Defender: A Black-box Backdoor Watermarking for Power System Deep Neural Network Ownership Verification. (Submitted to IEEE Transactions on Smart Grid)
- [6] **Zhenghao Zhou**, Yiyang Li*, Xinjie Yu, Runlong Liu, Zelin Guo, Zheng Yan, Mo-Yuen Chow. ChronoGrid: A Unified Causal Supervised Framework for Power System Time-Series Data Analysis Based on Large Language Model. (Submitted to IEEE Transactions on Smart Grid)

RESEARCH EXPERIENCE

- **2023.08 - present: Research Assistant and Master's candidate**

Shanghai Jiao Tong University

Topic: AI-based power data asset operations and maintenance

Duties included: Coding and academic writing

Supervisor: Assoc. Prof. Yiyang Li

- **2022.06-2023.07: Research Assistant**

Hunan University

Topic: Wireless power transmission

Duties included: Designing the PCB and writing the control code

Supervisor: Prof. Zhixing He

GRANDS AND SELECTED AWARDS

National Scholarship - (top 2%)

Ministry of Education of China

2025

Excellent Undergraduate Student Award – Provincial level - (top 3%) <i>Hunan Provincial Department of Education</i>	2024
University Excellent Undergraduate Student Award – University level - (top 5%) <i>Hunan University</i>	2024
Hugo Shong Scholarship <i>Hunan University</i>	2024
National Scholarship - (top 1%) <i>Ministry of Education of China</i>	2023
National Second prize of China University Intelligent Robot Creativity Competition <i>Chinese Association for Artificial Intelligence</i>	2023
National First prize of China Robotics and Artificial Intelligence Competition <i>Chinese Association for Artificial Intelligence</i>	2023
National First prize of China Robot Competition <i>Chinese Association of Automation</i>	2022
TBEA Scholarship <i>Hunan University</i>	2022

INTERNSHIP

Shenzhen InnoX Academy <i>Electronics and Algorithms engineer</i>	2024
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SKILLS

Software: PyCharm; Altium Designer; SolidWorks; LaTeX; Keil and so on.

Hardware: PCB welding; mechanical structure designing