

Jida Wang

✉ JWANG115@e.ntu.edu.sg ☎ (+86) 139 4718 6465 🌐 Homepage: <https://karphlorth.github.io/>

Education

Nanyang Technological University, Singapore

Singapore

M.Sc. in Power Engineering, School of Electrical and Electronic Engineering

Aug. 2025 – 2027

- **CGPA(until now):** 4.00/5.00
- **Thesis:** Cyber-Resilient Learning-Based Forecasting of Renewable Energy Generation in Multi-Plant PV and Wind Farms

Beijing Institute of Technology

Beijing, China

B.Sc. in Electrical Engineering and Automation, School of Automation

Sept. 2021 – June. 2025

- **Average Scores:** 82.89/100
- **Thesis:** Optimised Scheduling Strategy for Power Grids Considering Complementary Characteristics of Renewable Energy Forecast Errors

Publications

A Mamba-Based Denoising Autoencoder for Stealthy FDIA Detection in Power Systems

August. 2026

Jida Wang, Ziming Yan

2026 IEEE 18th Asia-Pacific Power and Energy Engineering Conference (APPEEC 26).

Optimized Scheduling Strategy for Power Grids Considering Complementary Characteristics of Renewable Energy Forecast Errors

July. 2025

Jida Wang, Wenshuang Liu, Jie Yang, Xi Zhang, Zi'an Li, Yingli Huo

2025 5th IEEE International Conference on Industrial Electronics for Sustainable Energy Systems (IESES 25).

Research Experiences

Lab of Dr. Yan Xu, Nanyang Technological University, Singapore

Sep. 2025 - Present

Research Assistant: Resilience Enhancement in Sustainable Power Grids via Mamba-Driven Anomaly Detection

Advisor: Dr. Yan Xu

- Engineered a cyber-physical time-series simulation environment for the IEEE 39-bus system, integrating realistic wind and solar generation profiles.
- Formulated non-linear AC Optimal Power Flow (AC-OPF) utilising the IPOPT solver to establish physical operational baselines, incorporating custom structural constraints for inverter-based resources.
- Designed and simulated coordinated cyber-threat models, encompassing workload FDIA and targeted SCADA sensor spoofing, to evaluate grid vulnerabilities.
- Developed an end-to-end Mamba-driven State-Space anomaly detection framework with linear-time sequence modelling capabilities to process high-frequency multisensor time series.
- Implemented a Denoising Autoencoder (DAE) Fast Online Calibration strategy with sliding windows to continuously learn the dynamic healthy grid manifold and prevent Identity Mapping Collapse.
- Achieved accurate spatio-temporal localisation of stealthy sensor attacks with zero temporal hysteresis and a 20x to 30x Signal-to-Noise Ratio (SNR) gain.
- Published a paper as the first author with the title of A Mamba-Based Denoising Autoencoder for Stealthy FDIA Detection in Power Systems on 2026 IEEE 18th Asia-Pacific Power and Energy Engineering Conference (PES APPEEC 26).

Lab of Dr. Yan Xu, Nanyang Technological University, Singapore

Sep. 2025 - Present

Research Assistant: Advanced Energy Management and Data Fusion for Smart Microgrids and Smart Nanogrids (Joint R&D Project with LITE-ON)

Advisor: Dr. Yan Xu

- Applied YOLOv8 and OCR techniques to identify equipment and extract labels from single-line diagrams (SLDs). Helped to build a symbol-to-parameter mapping library.
- Helped to establish bidirectional mapping between power flow models and SLD images, supporting both from images to models and generation of standardised SLDs from models.
- Integrated physical power flow computation results with SLD visual features via a multi-modal Transformer framework to enhance grid state awareness and forecasting capability. Designed the system to support rapid modelling for complex industrial distribution networks and renewable integration scenarios.
- Helped to develop an adaptive SLD information extraction and multi-modal power flow modelling system, enabling automatic device and connection data extraction from SLDs to construct corresponding power flow analysis models.

Renewable Power Grid Analysis, Optimisation and AI Application Lab,
Beijing Institute of Technology
Research Assistant

Nov. 2024 - June. 2025
 Advisor: Dr. Xi Zhang

- Investigated the spatial-temporal complementarity of renewable energy forecast errors using one-year operational data. Quantified the aggregation effect of forecast errors and demonstrated significant error compensation among geographically distributed renewable plants.
- Developed a complementarity-aware uncertainty set and incorporated it into an optimisation-based power system scheduling model, with hot-reserve constraints designed to better represent aggregated renewable uncertainty. Formulated a multi-constraint optimal dispatch problem considering costs and requirements.
- Developed a bilevel solution framework combining adversarial scenario generation, two-stage robust optimisation, linearisation, and master-subproblem decomposition.
- Performed MATLAB-based simulations and achieved 90.83% lower wind curtailment and 55.61% lower total operating cost, validating the effectiveness of complementarity-aware renewable scheduling.
- Published a paper as the first author with the title of Optimized Scheduling Strategy for Power Grids Considering Complementary Characteristics of Renewable Energy Forecast Errors on 2025 5th IEEE International Conference on Industrial Electronics for Sustainable Energy Systems (IESES 25).

Electrical Engineering and Control Lab, Beijing Institute of Technology
Research Assistant

Mar. 2024 - July. 2024
 Advisor: Prof. Xiwei Peng

- Completed the control of the lift following the implementation process of a real engineering project, with a focus on the lift industry.
- Designed a control algorithm using the Siemens S7-1200 series PLC as the control system, with the lift simulation model as the controlled object.
- Participated in the 18th Siemens Cup CIMC China Intelligent Manufacturing Challenge in the Intelligent Manufacturing Engineering Design and Application category, focusing on Discrete Industry Automation - Logic Algorithms and earned provincial second prize.

Cambridge AI Lab, remotely at Cambridge University
Research Assistant

Jan. 2023 - March. 2023
 Advisor: Prof. José Miguel Hernández-Labado

- Presented the YOLOv5 algorithm for object detection tasks in highway safety, achieving high accuracy through the use of over 20000 annotated samples for training, validation, and testing, whose algorithm consists of a feature extraction layer, feature integration layer, and detection layer, and is evaluated using precision-recall curves and confusion matrices.

Work Experience

Crystal Clear Environmental Pte Ltd, Singapore
Internship

Aug. 2026 - Dec. 2026

- Performed an analysis of Demand Response (DR) and Interruptible Load (IL) prices, forecast accuracy, and abnormal market conditions.
- Evaluated Uniform Singapore Energy Price (USEP) and DR predictions by comparing actual real-time market results (DPR) with multiple forecast sequences (LAR), classifying future DR events into Load Curtailment Price (LCP) categories based on historical trajectories.

- Developed a model and scoring system that can support practical DR bidding decisions.
- Reconstructed IL activation events using market advisories for activation and restoration, and analysed Contingency Reserve Price distributions to identify high-price patterns linked to system incidents.
- Engineered cross-dataset Python analysis pipelines connecting forecasts, actual market outcomes, and system incidents, delivering structured statistical tables, charts, and rule-based recommendations to optimise DR/IL market participation.
- Developed a clear IL high-price pattern that can help identify which periods are more attractive for IL participation.

Slective Projects

Software Systems

Sep. 2025 - Now

- Single-Line-Diagram-Driven Multimodal Distribution Network Digital Twin Automation Platform

Control Systems

Mar. 2024 - May. 2024

- Designed a two-story building lift system using a TL082 integrated operational amplifier and 74LS00, incorporating necessary RC circuits for generating square waves, narrow rectangular pulse signals with 5%-35% duty cycle, and sine and cosine signals, emphasizing state machine (FSM) and datapath design methods to improve system efficiency and stability.
- Designed and implemented a flywheel speed control system for spacecraft simulation using a DC motor and PWM, achieving zero steady-state error, less than 10% speed overshoot, and less than 5% current overshoot, with verified dynamic performance and stability through simulation, while also addressing economic and environmental considerations.

Awards

Third Class Scholarship, Beijing Institute of Technology

2022, 2023

Second Class Scholarship, Beijing Institute of Technology

2024

Second Prize, 18th Siemens Cup CIMC China Intelligent Manufacturing Challenge

2024

Technologies

Languages: Mandarin Chinese (Native), English (IELTS 8.0), Spanish (Elementary), Japanese (Elementary)

Programming Languages: C++, MATLAB, Python, SQL, $\text{\LaTeX}$

Library/Framework/Tool/Software: Pytorch, PLC, SolidWorks, Altium Designer, Julia, MySQL, Numpy