

YIZHOU DING

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📄 IELTS: 7.5 (Listen:8; Reading:7.5; Writing:6.5; Speaking:7.5)

EDUCATION

- **Université Paris Sciences & Lettres (QS ranking 24)** Paris, France
Master de Sciences, Technologies, Sante, Mention Energie; Supervisor: Prof. George Caralis Sep. 2021 – Jun. 2024
- **Huazhong University of Science and Technology (985 Program)** Wuhan, China
Master of New Energy Science and Engineering; Supervisor: Prof. Yuanzheng Li Sep. 2021 – Jun. 2024
- **Wuhan University of Technology (211 Program)** Wuhan, China
Bachelor of Communication Engineering; GPA: 3.71/4.00; Sep. 2017 – Jun. 2021

RESEARCH INTEREST

- † **Main Interest:** Adaptive Machine Learning; Deep Learning; Spatial-temporal Graph Learning; Semi-supervised Representation Learning; Federated Learning.
- † **Application-level Interest:** Smart Grid Analysis; Power System Operation; Renewable Energy Forecast.

PUBLICATIONS

1. Li, Y. (Advisor), **Ding, Y.**, Liu, Y., Yang, T., Wang, P., Wang, J., and Yao, W, “Dense skip attention based deep learning for day-ahead electricity price forecasting”, in *IEEE Transactions on Power Systems*, 2022, doi: 10.1109/TPWRS.2022.3217579. [PDF]
2. Zhou, Y., Liang, H., Zou, X., **Ding, Y.*** (Corresponding Author), “Topology Identification of Distribution Networks Based on Physics-Informed Latent Graph Attention Network”, *2023 3rd International Joint Conference on Energy, Electrical and Power Engineering (COEPEE)*, 2023, accepted.
3. Li, Y. (Advisor), Long, X., Li, Y*, **Ding, Y.**, Yang, T., Zeng, Z., “A Demand-Supply Cooperative Responding Strategy in Power System with High Renewable Energy Penetration”, in *IEEE Transactions on Control Systems Technology*, 2023.
4. Li, Y. (Advisor), **Ding, Y.**, He, S., Li, Y., Gao, L., Zeng, Z., Chung, C., “Privacy-Preserving Graph Inference Network for Multi-Entity Wind Power Forecast: A Federated Learning Approach”, in *IEEE Transactions on Sustainable Energy*, 2023, under review.
5. **Ding, Y.**, Li, Y. (Advisor), “Elicit Compact Representation Learning on Renewable Energy Forecast based on Closed-loop Self-Supervision”, 2023, in prep..
6. Li, Y. (Advisor), He, S., **Ding, Y.**, et al., “AI for Renewable Power System Operation”, *Nature Review Electrical Engineering*, 2023, under review.

RESEARCH EXPERIENCE

- **Artificial Intelligence (AI) for Renewable Power System Operation** Wuhan, China
Advisor: Prof. Yuanzheng Li and Prof. Hoay Beng Gooi Mar. 2023 - Present
 - **Objectives:** Presented an overview of current artificial intelligence techniques employed in the renewable power system operation; Explored the applicability of these techniques to different operational problems; Discussed potential trends in renewable power system development and prospective approaches to address the ever-evolving operational challenges.
 - **Contribution:** Provided a summary of the predictive methods used in the “source-load-grid” components of the renewable power system operation in the context of the dual-carbon goal as well as the application of AI methods in various types of prediction; Wrote the “forecasting” part of the paper entitled “AI for Renewable Power System Operation”.
- **Elicit Compact Representation in Renewable Energy (RE) Forecasting** Wuhan, China
Independent research Jan. 2023 - Present

- **Objectives:** Explored informative representation of stochastic RE generation datasets; Exploited the RE representation to effectively generate multi-horizon forecast both in deterministic and interval way.
 - **Contribution:** Designed a unified representation learning scheme for RE forecasting; Developed a contrastive& contractive encoder to elicit intricate RE characteristics; Proposed a complementary downstream regressor to distill the representation to predictions; Established an effective interval forecast scheme based on the generated representation.
- **Topology Identification for Distribution Network (DN) with PV Integration** Wuhan, China
Independent research Jan. 2023 - Jul. 2023
- **Objectives:** Abstracted topological identification into a multi-classification problem; Estimated the topology of the DN precisely with only voltages given in each node; Designed effective method to exploit the physical information underlies the topology of DN.
 - **Contribution:** Constructed concrete graph representation based on real topology of IEEE 33 bus system; Developed a graph-learning framework to identify the topology of DN in different time slot; Combined sub-graphs into a sparsified graph representation to enable multiple mini-batch training scheme.
- **Privacy-Preserving Multi-entity Wind Power Forecast (MWPF)** Wuhan, China
Advisor: Prof. Yuanzheng Li May. 2022 - Present
- **Objectives:** Accomplished multi-entity wind power forecasting without breaching the privacy across clients; Developed a cooperative privacy-preserving MWPF method to solve the data silo dilemma; Elicited *spatial-temporal dependencies* in the wind-related meteorological features to reduce the uncertainties in wind power prediction.
 - **Contribution:** Proposed a collaborative privacy-preserving framework for MWPF based on federated learning; Built a high-capacity graph learning model named Graph Inference Network (GIN) for local model pruning; Created a structure-independent dynamic graph inference block to efficiently elicit the *spatial interdependencies*; Designed a customized federated learning protocol to address the *heterogeneous temporal dependencies*.
- **Attention-Based Day-Ahead Electricity Price (DAEP) Prediction** Wuhan, China
Key Scientific and Technological Research Project of State Grid Corporation; Advisor: Prof. Yuanzheng Li Jan. 2021 - Jul. 2022
- **Objectives:** Explored the internal *temporal* and *feature-wise variability* of the electricity price in the liberalized power markets; Addressed these two challenges in the DAEP forecasting by developing effective deep learning models.
 - **Contribution:** Designed an end-to-end framework to automatically read the price data files and to predict the DAEP using historical price-related data; Constructed an advanced deep learning block to extract the *temporal variability*; Developed a dense skip attention block which enables the model to automatically distinguish and emphasize the critical features in an effort to deal with *feature-wise variability*.

PROJECT & TEAMWORK EXPERIENCE

- **AI-Enabled Computational Methods for Smart Grid Forecast and Dispatch** Wuhan, China
Participated in Book Manuscript Writing Aug. 2022 - Oct. 2022
- **Objectives:** Reported novel breakthroughs in intelligent decision-making approaches for optimization of smart grid dispatch; Presents recent development of deep learning and machine learning in smart grid forecast problems.
 - **Contribution:** Wrote the Chapter IV and VI in the book titled “*Artificial Intelligence Enabled Computational Methods for Smart Grid Forecast and Dispatch*”. [\[PDF\]](#)
- **Distributed Harmonics Monitor & Mitigation in Large-scale Public Buildings** Wuhan, China
National First Prize (Top 2.2%) Project Oct. 2019 - Aug. 2020
- **Objectives:** Designed a distributed smart harmonics monitor & mitigation system for the electrical system in large-scale public buildings to improve energy efficiency.
 - **Contribution:** Adopted distributed method to replace the centralized harmonic mitigation; Conducted an active power filter sub-system simulation using Simulink; Designed a smart grid harmonic mitigation mechanism based on edge computing; Developed a hardware device based on STM32 and MSP to achieve grid data acquisition, data transmission, and command reception;

HONORS & AWARDS

Interdisciplinary Contest In Modeling (ICM) Honorable Mention (Global Top 30%)	May 2023 Team member
Asia and Pacific Mathematical Contest in Modeling (APMCM) Third Prize in Asia Pacific region	Jan. 2023 Team leader
“Double Carbon” Innovation and Creativity Competition for Postgraduate Third Prize in China region	Jan. 2023 Team member
First Class Academic Scholarship for Postgraduate (two times) Huazhong University of Science and Technology	Nov. 2021 & Nov. 2022
Merit Student Huazhong University of Science and Technology	Sep. 2022
Outstanding Graduate Wuhan University of Technology	Jun. 2021
Postgraduate Candidate Exempt from Admission Exam Ranked 6/57 (10.5%) in all exemplary candidates	Sep. 2020
National University Student Social Practice and Science Contest on ESER National First Prize (Top 2.2%); ESER: Energy Saving and Emission Reduction	Aug. 2020 Team member
National College Student Innovation and Entrepreneurship Training Program Completed the national project with excellence	Aug. 2020 Team leader
Third Prize of National Undergraduate FPGA Innovation Design Competition Third Prize in China region	Nov. 2019 Team leader
National Undergraduate Electronics Design Contest Third Prize in Hubei Province	Aug. 2019 Team leader
Merit Student (two times) Wuhan University of Technology	Sep. 2018 & Sep. 2019
First Class Scholarship for Undergraduate Wuhan University of Technology	Jun. 2018

ACADEMIC SERVICE

• Peer Reviewers <i>IEEE Transactions on Intelligent Vehicles, top journal in engineering</i>	Jul. 2023 JCR Q1
• Peer Reviewers <i>Journal of Modern Power Systems and Clean Energy</i>	Sep. 2022 JCR Q2
• Peer Reviewers <i>Applied Energy top journal in engineering</i>	Jul. 2022 JCR Q1

EXTRACURRICULAR EXPERIENCE

• Point-Corp Future Entrepreneur School <i>Advisor: Prof. Yu Liu, CEO of Dian Organization</i>	Wuhan, China Mar. 2023 - Jun. 2023
• Global Youth Leadership Academy (GYLA) <i>Advisor: Dr.Liangrong Zu, Founder of GYLA, Senior Official of United Nations</i>	Turin, Italy & Wuhan, China Jan. 2021 - Feb. 2021