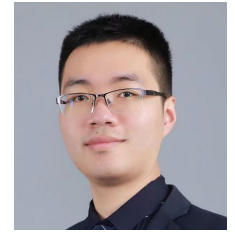


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Education

Year	Degree	Major	Institution	Supervisor	GPA
2019 – Now	Ph.D.	Data Science and Info Tech*	Tsinghua University	Xuan Zhang/Hongbin Sun	3.9/4.0
2015 – 2019	B.Sc.	Physics	Nanjing University	Lin Zhou/Jia Zhu	4.7/5.0

* Expected to be switched to *Electrical Engineering* before graduation.

Overseas Experience

Year	Identity	Major	Institution	Supervisor	GPA
2023 – Now	Visiting Scholar	Computer Science	University of California, Berkeley	Somayeh Sojoudi	—
2019 – 2021	Master*	Applied Data Science	University of Michigan, Ann Arbor	—	3.9/4.0
2017 – 2017	Exchange Student	Physics	Duke University	Sara Haravifard	3.9/4.0

* An online Master's degree program.

Awards

Awarded during Ph.D. study at Tsinghua University:

- 2022.10 National Scholarship for Graduates.
- 2021.11 Comprehensive Scholarship Award (First Prize, University Level).
- 2020.11 Comprehensive Scholarship Award (First Prize, Department Level).

Awarded during undergraduate study at Nanjing University:

- 2019.09 Outstanding Graduation Thesis.
- 2019.06 Outstanding Graduating Student.
- 2016.11 National Scholarship for Undergraduates.

Research Experience

- Improvements on Federated Learning and Its Application in the Smart Grid** **Feb 2021 - Now**
Supervisor: Prof. Xuan Zhang *Tsinghua University*
 - Demonstrated the applicability and potentials of *federated learning* in *Smart City load prediction* problems.
 - Proposed a *hybrid federated learning framework based on XGBoost*, in order to incentivize homogeneous and heterogeneous data holders to simultaneously join in the collaborative training.
 - Designed a *multi-task federated learning framework for district load forecasting*, with dynamic and simultaneous district dropout mechanisms, respectively.
- Model-Driven and Data-Driven Scheduling of Integrated Energy Systems** **Jul 2019 - Jan 2021**
Supervisor: Prof. Hongbin Sun *Tsinghua University*
 - Improved the *heuristic Progressive Hedging algorithm*, in order to accelerate convergence in stochastic electricity-gas coupled scheduling problems.
 - Applied *artificial neural networks* to achieve *fast and accurate economic dispatch* in an electricity-gas coupled system.
 - Proposed a *data-driven warm start algorithm for optimal economic dispatch* in integrated energy systems.
- Solar-Thermal Conversion based on Nanomaterials** **Mar 2017 - Jun 2019**
Supervisor: Prof. Lin Zhou/Prof. Jia Zhu *Nanjing University*
 - Designed a highly efficient *solar thermal photovoltaic absorber* based on the *Optical TMM State*.
 - Conducted studies and reviews on *nano-scale solar water evaporation*.
 - Explored the theoretical limit of *solar radiative cooling*, and designed follow-up experiments to measure the actual cooling effect.

Internships

1. Huawei Technologies Ltd.

May 2021 - Sept 2021

2012 Laboratories – Central Research Institute – Service Lab

- Developed an XGBoost-based federated learning framework with dynamic task allocation.
- Construct an XGBoost learning model to predict the energy consumption patterns of Huawei's 5G base stations.
- 2021 Creativity Pioneer Award (First intern awarded in the Lab).

Technical Skills

- English skills: CET-6 626, TOEFL 110, GRE 329+3.5.
- Programming Languages: Python, MATLAB, C++.
- Coding Expertise: Data Analysis (Pandas, Scikit-learn), Deep Learning (TensorFlow), Git Version Control.

Publications

- 2023.02 H. Liu, X. Zhang, H. Sun, and M. Shahidehpour, "Boosted multi-task learning for inter-district collaborative load forecasting," *IEEE Trans. Smart Grid* (Third-Round Review).
- 2022.10 H. Liu, X. Zhang, X. Shen, H. Sun, and M. Shahidehpour, "A hybrid federated learning framework with dynamic task allocation for multi-party distributed load prediction," *IEEE Trans. Smart Grid* (Accepted).
- 2022.08 H. Liu, X. Zhang, X. Shen, and H. Sun, "Privacy-preserving power consumption prediction based on federated learning with cross-entity data," in *Chinese Control Decis. Conf. (CCDC)*.
- 2022.05 Z. Lin*, H. Liu* et al., "Tamm plasmon enabled narrowband thermal emitter for solar thermophotovoltaics," *Sol. Energy Mater. Sol. Cells*, vol. 238, Art. No. 111589 (***Equal Contribution**).
- 2021.11 H. Liu, L. Yang, X. Shen, Q. Guo, H. Sun, and M. Shahidehpour, "A data-driven warm start approach for convex relaxation in optimal gas flow," *IEEE Trans. Power Syst.*, vol. 36, no. 6, pp. 5948-5951.
- 2021.07 H. Liu et al., "Application of modified progressive hedging for stochastic unit commitment in electricity-gas coupled systems," *CSEE J. Power Energy Syst.*, vol. 7, no. 4, pp. 840-849.
- 2020.12 H. Liu, X. Shen, Q. Guo, and H. Sun, "A data-driven approach towards fast economic dispatch in electricity-gas coupled systems based on artificial neural network," *Appl. Energy*, vol. 286, Art. No. 116480.
- 2020.07 H. Liu, X. Shen, H. Sun, and W. Zhao, "Stochastic day-ahead scheduling of electricity-gas coupled systems via progressive hedging," in *IEEE Ind. Commer. Power Syst. Asia Tech. Conf.*, pp. 64-69.
- 2020.06 W. Zhao, J. Zheng, Z. Han, and H. Liu, "Large-disturbance stability analysis method based on mixed potential function for AC/DC hybrid distribution network with PET," *IET Gener. Transm. Distrib.*, vol. 14, no. 18, pp. 3802-3813.
- 2019.09 X. Liu*, H. Liu*, X. Yu, L. Zhou, and J. Zhu, "Solar thermal utilizations revived by advanced solar evaporation," *Curr. Opin. Chem. Eng.*, vol. 25, pp. 26-34 (***Equal Contribution**).
- 2019.08 Y. Wang, H. Liu, and J. Zhu, "Solar thermophotovoltaics: progress, challenges and opportunities," *APL Mater.*, vol. 7, no. 8, Art. No. 080906.
- 2019.07 H. Liu, X. Yu, J. Li, N. Xu, L. Zhou, and J. Zhu, "Plasmonic nanostructures for advanced interfacial solar vapor generation," *Sci. Sin.-Phys. Mech. Astron.*, vol. 49, Art. No. 124203.
- 2019.04 J. Liang, H. Liu, J. Yu, L. Zhou, and J. Zhu, "Plasmon enhanced solar vapor generation," *Nanophotonics*, vol. 8, no. 5, pp. 771-786.