

# LINWEI SANG

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## RESEARCH INTEREST

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Work on fusing learning and optimization to facilitate the sustainable, safe, and carbon-aware energy systems from the comprehensive perspectives of decision-focused prediction, constraint learning, and online optimization.

## EDUCATION

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**Tsinghua University** Supervised by Prof. Yinliang Xu Beijing, China  
Ph.D. candidate in Electrical Engineering GPA: 3.9/4.0 Sept. 2021 - 2024 (Expected)

**University of California, Berkeley** Advised by Prof. Shmuel S. Oren California, U.S.A.  
Visiting student in Electrical Engineering May 2023 - May 2024 (Expected)

**Southeast University** Supervised by Prof. Qinran Hu Nanjing, China  
M.Eng. Electrical Engineering (with honors) GPA: 3.7/4.0 (7/78) Sept. 2018 - Jun. 2021

**Southeast University** Supervised by Prof. Zaijun Wu Nanjing, China  
B.Eng. Electrical Engineering (with honors) GPA: 3.9/4.0 (5/228) Sept. 2014 - Jun. 2018

## PUBLICATION

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### Submitted Papers:

[S1] **Linwei Sang**, Yinliang Xu, Hongbin Sun, Qiuwei Wu, and Wenchuan Wu, "Distribution Locational Marginal Emission for Carbon Alleviation in Distribution Networks: Formulation, Calculation, and Implication" submitted to *IEEE Transactions on Sustainable Energy*, under the first review.

### Selected Journal Papers:

[J1] **Linwei Sang**, Yinliang Xu, Wenchuan Wu, and Huan Long, "Online Voltage Regulation of Active Distribution Networks: A Deep Neural Encoding-Decoding Approach" *IEEE Transactions on Power Systems*, Early Access, 2023.

[J2] **Linwei Sang**, Yinliang Xu, and Hongbin Sun, "Encoding Carbon Emission Flow in Energy Management: A Compact Constraint Learning Approach," *IEEE Transactions on Sustainable Energy*, Early Access, 2023.

[J3] **Linwei Sang**, Yinliang Xu, Zhongkai Yi, Lun Yang, Huan Long, and Hongbin Sun, "Conservative Sparse Neural Network Embedded Frequency Constrained Unit Commitment With Distributed Energy Resources," *IEEE Transactions on Sustainable Energy*, Early Access, 2023.

[J4] **Linwei Sang**, Yinliang Xu, and Hongbin Sun. "Ensemble Provably Robust Learn-to-optimize Approach for Security-Constrained Unit Commitment", *IEEE Transactions on Power Systems*, Early Access, 2022.

[J5] **Linwei Sang**, Yinliang Xu, Huan Long, and Wenchuan Wu, "Safety-aware Semi-end-to-end Coordinated Decision Model for Voltage Regulation in Active Distribution Network", *IEEE Transactions on Smart Grid*, vol. 14, no. 3, pp. 1814-1826, May 2023.

[J6] **Linwei Sang**, Yinliang Xu, Huan Long, Qinran Hu, and Hongbin Sun, "Electricity Price Prediction for Energy Storage System Arbitrage: A Decision-focused Approach", *IEEE Transactions on Smart Grid*, vol. 13, no. 4, pp. 2822-2832, Jul. 2022.

[J7] **Linwei Sang**, Qinran Hu, Yinliang Xu, and Zaijun Wu, "Privacy-preserving Hybrid Cloud Framework for Real-time TCL-based Demand Response," *IEEE Transactions on Cloud Computing*, Early Access, 2022.

[J8] Huan Long, **Linwei Sang**, Zaijun Wu, and Wei Gu, "Image-Based Abnormal Data Detection and Cleaning Algorithm via Wind Power Curve," *IEEE Transactions on Sustainable Energy*, vol. 11, no. 2, pp. 938-946, Apr. 2020.

[J9] Zipeng Wang, **Linwei Sang**, Yinliang Xu, B. Wang, and Hongbin Sun, "Improved Quantile Regression Based Approach for Renewable Power Generation Interval Prediction on Islands" was accepted to *CSEE Journal of Power and Energy Systems*.

[J10] Can Huang, Qinran Hu, **Linwei Sang**, et al. "A Review of Wildfire Mitigation Plans in Power Systems: Datasets, Model, and Industry Practice," *IEEE Transactions on Energy Markets, Policy and Regulation*, Early Access, 2023.

[J11] Yifei Wang, Ziheng Yan, **Linwei Sang**, et al. "Acceleration Framework and Solution Algorithm for Distribution System Restoration based on End-to-End Optimization Strategy," *IEEE Transactions on Power Systems*, Early Access, 2023.

[J12] Zhongkai Yi, Yinliang Xu, H. Wang, and **Linwei Sang**, "Coordinated Operation Strategy for a Virtual Power Plant With Multiple DER Aggregators," *IEEE Transactions on Sustainable Energy*, vol. 12, no. 4, pp. 2445-2458, Oct. 2021

## Selected Conference Papers:

[C1] **Linwei Sang**, Yinliang Xu, W. K. V. Chan and Zixuan Wei, “Carbon-aware Integrated Energy System Operation with Demand Response,” *2022 IEEE 5th International Electrical and Energy Conference (CIEEC)*, 2022, pp. 832-837, **Oral speech, Best Paper Award.**

[C2] **Linwei Sang**, Qinran Hu, Yuan Zhao, Rushuai Han, Zaijun Wu, and Xiaobo Dou, “A Scenario-adaptive Online Learning Algorithm for Demand Response,” *IEEE Power Energy & Society General Meeting (PESGM)*, 2020, pp. 1-5.

## Patents:

[P1] Zaijun Wu, Jiaming Chen, and **Linwei Sang**, “A multi-terminal differential protection scheme for active distribution network based on amplitude and phase relationship” (**Granted**).

## AWARDS

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<b>Tsinghua University Excellent Scholarship Second Prize (5%)</b>	Oct. 2022
<b>Best student paper award in CIECC (5%)</b>	May 2022
<b>Outstanding graduate student in Southeast University (1%)</b>	Sept. 2021
<b>Graduate national scholarship in Southeast University (1%)</b>	Oct. 2020
<b>Outstanding bachelor student in Southeast University (1%)</b>	Sept. 2018

## SELECTED PROJECTS

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<b>[P1] Guangdong Basic and Applied Basic Research Foundation</b>	Jun. 2022 - Dec. 2023
<b>[P2] Data and Model-driven Distributed Resource Management supported by NNSF</b>	Jun. 2022 - Dec. 2023
<b>[P3] National Key R&amp;D Program (Island operation)</b>	Jun. 2022 - Dec. 2025
<b>[P4] Chinese Academy of Sciences Consulting Project (Hydro planning)</b>	Jun. 2021 - Dec. 2021

## PROFESSION EXPERIENCES

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**Reviewers for Journals:** IEEE Transactions on Industrial Informatics; IEEE Transactions on Power Systems; IEEE Transactions on Sustainable Energy; International Journal of Electrical Power Systems Research; IET Renewable Power Generation; IET Generation, Transmission, & Distribution;

**INFORMS Student Member** May 2022 - Now

**IEEE Graduate Student Member** May 2019 - Now

**Teaching Assistant of Power System Calculation Approach in Tsinghua University** Jan. 2023 - Jun. 2023

**Teaching Assistant of Distributed Optimization in Power System in Tsinghua University** Sept. 2022 - Jan. 2023

## TECHNIQUES

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**Programming language:** Python, Matlab, L<sup>A</sup>T<sub>E</sub>X, Julia, C++, SQL, HTML, and Mathematica

**Framework:** PyTorch, Tensorflow (for deep learning), Sklearn (for machine learning), OpenCV (for computer vision), Cvxpy (for optimization) ...

**Tools:** Linux, Git, Vim, VSCode, Office, PyCharm, OmniGraffle

**Language:** Chinese (Native), English

## REFERRER

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**Referrer 1:** Yinliang Xu, Associate Professor, Tsinghua University, **Contact:** xu.yinliang@sz.tsinghua.edu.cn;

**Relationship:** Ph.d Supervisor;

**Referrer 2:** Hongbin Sun, Professor, IEEE fellow, Tsinghua University, **Contact:** shb@tsinghua.edu.cn;

**Relationship:** Collaborating Mentor;

**Referrer 3:** Shmuel S. Oren, Professor, IEEE life fellow, INFORMS fellow, National Academy of Engineering Member, UC, Berkeley, **Contact:** oren@ieor.berkeley.edu

**Relationship:** Collaborating Mentor.