YUANXI WU

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Education

Southeast University (Project 985, Double First Class University) **Sep. 2021 – June 2024**
M. Sc. in Electrical Engineering *Jiangsu, China*
- **Average Score:** 94.53/100 | **Ranking: 1/157** (**Top 1%**)

Hohai University (Project 211, Double First Class University) **Sep. 2017 – June 2021**
B. Sc. in Electrical Engineering and Automation *Jiangsu, China*
- **Average Score:** 93.24/100 | **Ranking:** 3/216 (**Top 1%**)

Selected Honors & Awards

China National Scholarship, Ministry of Education of China 2019
Outstanding Graduates of Jiangsu Province, Jiangsu Education Department (**Top 0.2%**) 2021
1st Prize in the Final of National College Mathematics Competition, Chinese Mathematical Society (**Top 0.05%**) 2019
Merit Graduate Student, Southeast University 2022
Top 100 Outstanding Students, Hohai University 2020
1st Prize Scholarship, Southeast University 2022

Research Experience

Managing Stochastic OPF Facing High Renewable Penetration (Dissertation) **Sep. 2022 – Present**
Supervisors: Prof. Wei Gu, Prof. Yijun Xu, and Assoc. Prof. Zhi Wu (Southeast University) *Jiangsu, China*
- Facilitated efficient high-dimensional uncertainty quantification through an extension of unscented transform.
- Conducted data-driven surrogate modeling under arbitrarily distributed and correlated uncertainties using a novel variant of polynomial chaos expansion.
- Coupled partial least squares and neural networks to enable improvement of voltage stability in large-scale systems.

Mechanism Design and Assessment of Power Trade in GMS Countries **April 2021 – June 2023**
Core team member | Science and Technology Project of China Southern Power Grid Co., Ltd. *Yunnan, China*
- Collected data and reports from different government departments and organizations.
- Wrote three technical reports independently and participated in the preparation of presentation slides.

Decentralized Implementation of Energy Markets and Mechanism Design **Sep. 2021 – Aug. 2022**
Supervisors: Prof. Wei Gu and Assoc. Prof. Zhi Wu (Southeast University) *Jiangsu, China*
- Designed a novel market mechanism that is incentive-compatible and individually rational to take into account social welfare and fairness simultaneously.
- Developed a joint energy, uncertainty, and carbon allowance trading market based on the consumer responsibility principle.
- Explored the multi-cut Benders decomposition, tightening McCormick envelope, and the alternating direction method of multipliers to enable decentralized implementation.

Detection of Abnormal Working Conditions of Energy Storage Batteries **July 2019 – May 2020**
Team leader | Supervisor: Prof. Hongzhong Ma (Hohai University) *Jiangsu, China*
- Collaborated with team members to establish the experimental platform and collect vibration signals of batteries.
- Analyzed frequency-domain data to extract vibration signal features under different working conditions using S transform.

Publications & Manuscripts (Reverse Order)

Journal Papers (* denotes corresponding author):

[1] **Y. Wu**, et al., "Computationally Enhanced Approach for Chance-Constrained OPF Considering Voltage Stability", *Sumitted to IEEE Transactions on Power Systems.* (Available: **arXiv: 2306.14527**)

[2] **Y. Wu**, et al., "Decentralized Energy Market Integrating Carbon Allowance Trade and Uncertainty Balance in Energy Communities", *Submitted to IET Renewable Power Generation.* (Available: arXiv: 2301.12129)

Publications & Manuscripts Continued

Journal Papers (* denotes corresponding author):

[3] Z. Wu, **Y. Wu**, et al., "Mechanism Design of Ancillary Service Market Considering Social Welfare and Fairness", in *CSEE Journal of Power and Energy Systems*. (**JCR Q1**; **Main Contributor** With Z. Wu Being Supervisor; To appear in Aug. 2023)

[4] H. Ma, **Y. Wu***, et al., "Identification of Overcharge Characteristics of Energy Storage Batteries Based on MRSVD and Time-Frequency Grayscale Image", in *Chinese Journal of Power Sources*, vol. 44, no. 9, pp.1351-1355, 2020. (**Main Contributor** With H. Ma Being Supervisor; Chinese Core Journal)

[5] X. Peng, H. Ma, H. Xu, C. Li, **Y. Wu**, et al., "A Novel Method of Early Warning for Abnormal Working Conditions of Energy Storage Batteries Based on Vibration", in *Electrical Measurement & Instrumentation*, vol. 60, no. 2, pp.167-171, 2020. (Chinese Core Journal)

[6] **Y. Wu**, et al., "Chance-Constrained AC Optimal Power Flow Considering High Penetration Renewables: A Data-Driven Approach", *In Preparation.*

Conference Paper:

[1] S. Zhao, Z. Wu, J. Wang, S. Zheng, J. Zhao, **Y. Wu**, "A Multi-Regional Coordinated Peer-to-Peer Energy Trading Market Mechanism in Distribution Networks", 2021 IEEE Sustainable Power and Energy Conference (iSPEC), Nanjing, China, 2021, pp. 1991-1996, doi: 10.1109/iSPEC53008.2021.9735624.

Teaching Experience

Teaching Assistant, Relay Protection of Power System **March 2022 – July 2022**

School of Electrical Engineering, Southeast University

- Graded course assignments of 87 undergraduate students and reported common mistakes made by students.

Undergraduate Mentor, Advanced Mathematics **Feb. 2019 – June 2019**

College of Water Conservancy and Hydropower Engineering, Hohai University

- Mentored more than 30 undergraduate students in advanced mathematics to prepare for mathematics competitions.

Extracurricular Activities

Reviewing:

- *Journal:* IET Generation, Transmission & Distribution

Volunteer Activities:

- Class president in Hohai University (Honored with Outstanding Student Leader)
- Student volunteer of "Young Elite Scientists Salon of China Association for Science and Technology" in 2021
- Community volunteer to conduct smartphone tutorials for senior citizens

Technical Proficiencies

Languages: CET-6 601 (**Top 8%**), GRE 332 (Verbal 162, Quantitative 170, Writing 4)

Scientific Software: MATLAB, Mathematica, Gurobi, Mosek, LaTex, Origin, VS Code