Wenrong Wei

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Education

Huazhong University of Science and Technology, M.S. in electrical engineering — Sep. 2022 – Jun. 2025
- GPA: 91.64/100 **(TOP 25%)**
- University Rankings (US News): **100th globally**

North China Electric Power University, B.S. in electrical engineering — Sep. 2018 – Jun. 2022
- GPA: 91.82/100 **(TOP 2%)**

Selective Publications

- **Wenrong Wei**, Shihong Miao*, et al. **Optimal Distribution Method for Frequency Regulation Commands Considering the State of Charge Recovery and Adjustment**, Proceedings of the CSEE, 2024. **(EI Journal)**
- Xin Sun, **Wenrong Wei***, et al. **Multi-Time Scale Market Participation Strategy of Wind-Energy Storage Combined System Considering Uncertainty**, Electric Power Automation Equipment, 2024. **(EI Journal)**

Projects

Electrical Market Transactions and Command Allocation Strategies for Wind Farms and Energy Storage Plants Providing Frequency Regulation Services — Jun. 2022 – Jun. 2024
- Develop a Multi-Time Scale Market Bidding Model for Wind Farm Equipped with Storage
  - **Model the uncertainty of wind power output with Copula Functions:** Create day-ahead wind power uncertainty models with static copula functions and intraday models with dynamic copula functions.
  - **Establish market bidding model for wind farm equipped with Energy Storage:** Establish day-ahead and intraday energy-frequency regulation market bidding models.
  - **Multi-time scale market participation strategy:** With the updating of wind power forecast data, adjust day-ahead bidding decisions to reduce deviation penalties.
- Propose a Two-Level Command Allocation Model for Wind Farms, Energy Storage Plants in AGC
  - **Upper-level: Coordinate SOC recovery of energy storage plants and utilization of wind power:** 1.Distribute commands among wind farm clusters, energy storage plant clusters, and thermal power plant clusters; 2.During down-command, increase wind farm output and energy storage charging power simultaneously, reducing wind farm curtailment and improving storage SOC recovery speed.
  - **Lower-level: Optimize energy distribution among energy storage plants:** 1.Distribute commands within clusters, such as within the energy storage plant cluster; 2.Balance economic efficiency and energy storage plant's SOC during allocation, preventing overuse and energy depletion of highly economical plants.

State of Health Estimation of Electrochemical Energy Storage Plants — Jan. 2024 – Mar. 2024
- Establish an SVR model for predicting the remaining life of energy storage plants
  - **Correlation analysis:** Compare the correlation strength between indirect indicators and the remaining lifespan of energy storage, then select the indicator with the highest correlation.
  - **Establish predictive model:** 1.Distribute commands within clusters, such as within the energy storage plant cluster; 2.Balance economic efficiency and energy storage plant's SOC during allocation, preventing overuse and energy depletion of highly economical plants.

Honors & Scholarships

- Outstanding Graduate of Hebei Province, 2022
- First Prize Scholarship of Huazhong University of Science and Technology, 2023, 2022
- First Prize Scholarship of North China Electric Power University, 2021, 2020, 2019

Additional Information

- Programmings & Tools: Matlab, C++, C, Simulink, Multisim, Latex
- Interest: Optimal Operation of Power System, Electrical Market, System Modeling, and Reinforcement Learning