

Zhengyang Hu (胡正阳)



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Research interests

Renewable Power Integration, Optimization and Control, Application of AI in Power Systems, and Smart Grids

Education

Ph.D. in Electrical Engineering **Southeast University** **2023.09**
Dissertation: Research on the transient frequency response characteristics and active control strategy for wind power plant.
Supervisor: [Prof. Bingtuan Gao](#).

B.E. in Electrical Engineering **China University of Mining and Technology** **2016.06**
Acquire solid fundamentals in mathematics, power systems, power electronics, and control theory. Rank 24th (out of the entire batch of 434 students) during the academic year 2012-2016.

Professional Experience

- Postdoctoral Fellow, **The Hong Kong Polytechnic University**, Principal Investigator: [Prof. Zhao Xu](#), 2023/10 ~ present
- Intern, **China Electric Power Research Institute**, 2018/04 ~ 2019/11

Publications

- [1] **Z. Hu**, B. Gao, Y. Mao, "Nonlinear model predictive control-based active power dispatch strategy for wind power plant considering dynamic wake effect," *International Journal of Electrical Power & Energy Systems*, 2023,148:108996. [link](#) (JCR: Q1, IF: 5.2)
- [2] **Z. Hu**, B. Gao, L. Zhang, W. Wang, S. Pan, "Bidirectional Support Capability Analysis and Adaptive Inertial Control Strategy of Wind Turbine," *Transactions of China Electrotechnical Society*, 2023, 38(19): 5224-5240. [link](#) (in Chinese)
- [3] **Z. Hu**, B. Gao, R. Sun, "An active primary frequency regulation strategy for grid integrated wind farms based on model predictive control," *Sustainable Energy, Grids and Networks*, 2022,32:100955. [link](#) (JCR: Q1, IF: 5.4)
- [4] **Z. Hu**, B. Gao, N. Chen, L. Qu, C. Peng, "Modified virtual synchronous generator based-primary frequency regulation for renewable generation integrated into power system," *IET Generation, Transmission & Distribution*, 2020,14(20):4435-4443. [link](#) (JCR: Q2, IF: 2.995)
- [5] B. Gao, **Z. Hu**, W. Wang, et al, "Review on fast active power control and frequency support technologies of renewable energy stations," *Proceedings of the CSEE*, 2023, in press. [link](#) (in Chinese)
- [6] Y. Zhang, **Z. Hu**, P. Peng, N. Chen, B. Tang, B. Gao, "Pole assignment based auxiliary damping control for renewable generation integrated into power system," *Electric Power*, 2021,54(10):217-222. [link](#) (in Chinese)
- [7] B. Gao, **Z. Hu**, L. Zhang, Z. Yang, "De-loading optimal control of wind farm based on wake effect," *Renewable Energy Resources*, 2018(1):117-125. [link](#) (in Chinese)
- [8] Y. Han, **Z. Hu**, Z. Yang, B. Gao, F. Duan and W. Fan, "A General Fault Ride Through Control Model for Typical Renewable Energy Generators," *2021 IEEE 11th Annual International Conference on*

CYBER Technology in Automation, Control, and Intelligent Systems (CYBER), Jiaxing, China, 2021, 549-554. [link](#)

- [9] Y. Mao, B. Gao, **Z. Hu**, et al, “Emergency Power Reduction Control Strategy of Wind Farm Considering DC Chopper of Doubly-fed Induction Generator,” *Proceedings of the CSEE*, 2023, in press. [link](#) (in Chinese)

Research Projects

Skills of **Matlab/Simulink**, **PSCAD** (software) and **DSP**, **RTLAB** (hardware) are used in the following projects.

1. **2023-2023** Research and implementation of Spatiotemporal Collaborative Frequency Control Technology in the Sending-end Power Grid with High Proportion New Energy Generation (Science and Technology Project of State Grid Corporation of China)
Involved in the research on the frequency characteristics of the sending-end power system with high proportion new energy generation and the corresponding frequency regulation strategy for new energy generation.
2. **2021-2023** Active and fast support of transient frequency and voltage for photovoltaic / wind power plant (National Key R&D Program of China under grant 2021YFB2400500)
Involved in the research on the active and fast frequency support technologies and the optimization of steady-state operating conditions for wind power plant.
3. **2018-2019** Research on Impact Mechanism and Active Support Technology for Application of Power Electronic on Renewable Energy in Regional Grid (sponsored by China Electric Power Research Institute)
Responsible for the scenario construction of photovoltaic/wind power plant integration and analysis of aggregation characteristics of photovoltaic/wind power plant.
4. **2017-2017** Research on the Impact of Large-scale Renewable Energy Integration on Damping Characteristics of Power System and the Corresponding Active Power Support Control Strategy (sponsored by China Electric Power Research Institute)
Involved in the analysis and control of damping characteristics of the power system integrated with renewable energy generation based on virtual synchronous generator.