BIN HUANG

Department of Electrical and Computer Engineering, Lyle School of Engineering
Southern Methodist University, Dallas, United States, 75205
Personal website: https://binhuangscut.github.io/
Email: bin@smu.edu

Education

Ph.D. in Electrical Engineering   **Sep. 2019- present**
Southern Methodist University, Dallas, United States
Research interest: machine learning, data analytics, decision making methods, and their applications on smart gird.
Advisor: Prof. Jianhui Wang, *IEEE Fellow*
GPA: 4.0/4.0

M.Sc. in Electrical Engineering (Power System and Its Automation)   **Sep. 2016-Jul. 2019**
South China University of Technology, Guangzhou, China
Thesis: A Probabilistic Approach for Equivalence of Active Distribution Networks Considering the Uncertainty of Renewable Energy Sources
Advisor: Prof. Q. H. Wu, *IEEE Fellow,* Prof. Zhigang Li
GPA: 3.8/4.0

B.Sc. in Hydropower Engineering   **Sep. 2012-Jul. 2016**
Huazhong University of Science and Technology, Wuhan, China
Thesis: Chaotic Anti-predator Particle Swarm Optimization for Short-term Generation Scheduling in Hydrothermal Power System
Advisor: Prof. **Qin Hui**
GPA: 3.9/4.0

Publications

Journal publications:

[J3]   **B. Huang** and J. Wang, "Deep Reinforcement Learning-based Capacity Scheduling for PV-Battery Storage System," *IEEE Transactions on Smart Grid*, early access, 2020.
[J2]   **B. Huang,** Z. Li, J. H. Zheng, and Q. H. Wu, "Probabilistic active distribution network equivalence with correlated uncertain injections for grid analysis," *IET Renewable Power Generation*, 14(11), July. 2020.
[J1]   **B. Huang,** P. Li, J. H. Zheng, and Q. H. Wu, "A Modified Ward Equivalent Based on Sensitivity Matrices for Static Security Analysis," *IEEJ Transactions on Electrical and Electronic Engineering*, vol. 13, pp. 1675-1676, May. 2018.

Working papers:

[W2]   **B. Huang** and J. Wang, "A Deep Reinforcement Learning-Enabled Flexible Equivalence for Active Distribution Networks".
[W1]   **B. Huang,** J. Li, and J. Wang, "An Evidential Reasoning Based Approach to Building Node Selection Criterion for Network Reduction". arXiv preprint arXiv:2012.13684.

Conference publications (peer reviewed):

[C2]   **B. Huang**, X. Shang, J. H. Zheng, Z. Li, Q. H. Wu and X. X. Zhou, "Electrical Network Equivalent Modeling Method with Boundary Buses Interconnected," *IEEE PES GTD 2019*,

Mar. 2019.

[C1]   Y. Ji, X. Zhang, X. Wang, X. Huang, **B. Huang**, J. H. Zheng and Z. Li, "An Equivalent Modeling Method for Multi-port Area Load Based on the Extended Generalized ZIP Load Model," *POWERCON 2018*, Noc. 2018.

Patents:

[P1]   A Probabilistic Equivalent Modelling Method for Active Distribution Networks Considering the Uncertainty of Renewable Energy Sources. No.201811472690.5 *(In Chinese)*

───────────────── **Project Experience** ─────────────────

Machine Learning-power Battery Storage Modeling and Evaluation for Fast Frequency Regulation Service   *11. 2019-present*
Southwest Research Institute and SMU
Contribution: 1) accurate model for battery based FFRS, which allows the integration of stationary/mobile batteries, renewable energy generation units as well as different energy demand patterns; 2) battery safety control scheme, which can adopt different ancillary services and market mechanisms; and 3) fully data-driven real-time optimal control strategies based on Deep Reinforcement Learning which can self-adjust according to the system and market dynamics.

Hierarchical Multi-Objective Reactive Power Optimization and Decision Making for Large Scale Power Systems Considering the Resilience   *11.2016-09.2018*
Power Dispatch and Control Center of Guizhou Power Grid Corp
Contribution: develop the software module of the network reduction, which can adaptively reduce the scale of the power system by eliminating the low voltage level buses. This module can scale to the practical power grid with more than 10,000 buses and has been launched in practice.

Key Technologies for Simulation and Visualization of Global Energy Internet *05,2017-06.2019*
China Electric Power Research Institute
Contribution: research on the equivalence method of distributed generation in active distribution network considering uncertainty, which can not only significantly alleviate the computation and communication burden of the deregulated bulk system.

───────────────── **Awards and Honors** ─────────────────

- China National Scholarship, *Ministry of Education of China*, September 2013. (0.2%)
- Outstanding Graduate, *Huazhong University of Science and Technology*, June 2016.
- Pan Jia Zheng Hydropower Scholarship, *China Society for Hydropower Engineering*, September 2014. (0.5%)
- Scholarship for Excellence in Academics, *Huazhong University of Science and Technology and South China University of Technology*, 2013, 2014, and 2016-2018.
- Merit Student, *Huazhong University of Science and Technology,* September 2013. (1%)

───────────────── **Skills** ─────────────────

Specialized Skills
- **Python:** Pytorch, Tensorflow, numpy, pandas, seaborn, matplotlib, etc.
- **Matlab:** Simulink, MATPOWER, optimization toolbox, etc.
- **Optimization Modeling and Solver:** GAMS, AMPL, Gurobi, and Ipopt
- **Linux and the usage of HPC**