Weiye Zheng
zhengwy13@tsinghua.org.cn
Area of expertise: power system stability analysis and enhancement,
distributed optimization algorithms, energy economics and market mechanism

Work Experience & Education Background

Assistant Professor, Doctoral Supervisor, University of Macau 2025.7-now
- State Key Laboratory of Internet of Things for Smart City

Associate Professor, Doctoral Supervisor, South China University of Technology 2020.12-2025.7
- School of Electrical Power Engineering

Postdoctoral Fellow, The University of Hong Kong 2018.8-2020.12
- Supervisor: Prof. David J. Hill, Department of Electrical and Electronic Engineering

Doctor of Engineering (with honors), Department of Electrical Engineering, **Tsinghua University** 2013.8-2018.7
- Supervisors: Prof. Boming Zhang and Prof. Wenchuan Wu

Visiting Scholar, School of Industrial and Systems Engineering, **Georgia Institute of Technology** 2016.9-2017.2

Bachelor (Double Major) in Economics, National School of Development, **Peking University** 2014.8-2016.7
- GPA: 3.7/4.0. Passed qualification exam for securities practitioner

Bachelor (with honors), Department of Electrical Engineering, **Tsinghua University** 2009.8-2013.7
- GPA: 91/100. Rank: 6/132. Scholarships for three consecutive years in 2010-2012.

Research Grants

- **Principle Investigator**

[1] Natural Science Foundation of China (NSFC) Youth Program, *Asynchronous Distributed Dispatch of Integrated Electricity and Heat Systems Based on Heating Network Feasible Region Projection*, 300,000 CNY, 2022.01-2024.12, PI. （国家自然科学基金青年项目）

[2] Task of Smart Grid-National Science and Technology Major Project, *Provincial Power System Multi-Dimensional Assessment Framework Towards Deep Low Carbon Objective*, 1,400,000 CNY, 2024.12-2028.12, PI. （智能电网国家科技重大专项子课题）

[3] Guangdong Basic and Applied Basic Research Foundation Offshore Wind Power General Program, *Power Grid Resilience Enhancement and Multi-Entity Coordination Mechanism Accommodating Large-Scale Offshore Wind Power*, 300,000 CNY, 2022.10-2025.09, PI. （广东省基础与应用基础研究基金海上风电联合基金面上项目）

[4] Guangdong Basic and Applied Basic Research Foundation General Program, *Incentive-Compatible Distributed Coordination Mechanism for Electricity-Heat Multi-Energy Synergy in New Type Power System*, 100,000 CNY, 2023.01-2025.12, PI. （广东省基础与应用基础研究基金面上项目）

[5] Open Fund of State Key Laboratory of HVDC, *Short-Term Voltage Stability Constraint Modeling and Mechanism Analysis for Low-Inertia Power System Operation Dispatch*, 200,000 CNY, 2023.01-2024.12, PI. （直流输电技术全国重点实验室开放课题）

[6] Guangzhou Science and Technology Planning Project, *Urban Power Grid Structure Optimization Considering Voltage Dynamics and Resilience*, 50,000 CNY, 2022.06-2024.03, PI. （广州市基础研究计划基础与应用基础研究项目）

[7] Open Fund of State Key Laboratory of Power System Operation and Control, *Contract Design Theory for Virtual Power Plant with Numerous Distributed Energy Resources Considering Multiple Market Trading*, 50,000 CNY, 2024.10-2025.12, PI. （新型电力系统运行与控制全国重点实验室开放课题）

[8] Open Fund of State Key Laboratory of Power System Operation and Control, *Distributed Mechanism Design and Operation Optimization of Integrated Electricity and Heat Systems Considering Information Asymmetry*, 50,000 CNY, 2022.08-2023.12, PI. （新型电力系统运行与控制全国重点实验室开放课题）

[9] Open Fund of State Key Laboratory of Power System and Generation Equipment, *Data-Driven Distributionally Robust Optimization for Active Distribution Networks*, 50,000 CNY, 2020.06-2021.12, PI. （电力系统及大型发电设备安全控制和仿真国家重点实验室开放课题）

[10] China Computer Federation-Tencent Rhino-Bird Fund, *Distributed Coordination Dispatch Strategy and Incentive Mechanism for Inter-Regional Power Grids Supporting East-West Computing Resources Transmission*, 50,000 CNY, 2022.10-2023.12, PI. （中国计算器学会-腾讯犀牛鸟基金）

[11] State Grid Scientific and Technological Project, *Efficient Utilization Assessment Framework for Power Grid with High Renewables*, 355,000 CNY, 2022.08-2022.12, PI. （国家电网科技项目）

[12] Double First-Class Initiative Construction Program, *Distributionally Robust Optimization for Integrated Energy Systems*, 400,000 CNY, 2021.03-2025.12, PI. （双一流建设项目）

- **Major Participant**

[13] Research Grants Council (Hong Kong) Theme-based Research Scheme, *Sustainable Power Delivery Structures for High Renewables*, 50.4M HKD, 2015.01-2019.12

[14] General Research Fund (Hong Kong), *Hierarchical and Distributed Control of Networked Microgrid Systems*, 673,470 HKD, 2020.01-2023.06

Representative Publications (Google Scholar Citations 2175, h-index 22, as of Jan. 2025)

- **Stability-aware robust scheduling**

[1] W. Huang, X. Zhang and **W. Zheng* (Corresponding Author)**. "Resilient Power Network Structure for Stable Operation of Energy Systems: A Transfer Learning Approach," *Applied Energy*, vol. 296, Art. No. 117065, 2021.

[2] W. Huang, **W. Zheng* (Corresponding author)**, and D. J. Hill, "Distribution Network Reconfiguration for Short-Term Voltage Stability Enhancement: An Efficient Deep Learning Approach," *IEEE Transactions on Smart Grid*, vol. 12, no. 6, pp. 5385-5395, 2021.

[3] **W. Zheng***, W. Huang, D. J. Hill and Y. Hou. "An Adaptive Distributionally Robust Model for Three-Phase Distribution Network Reconfiguration," *IEEE Transactions on Smart Grid*, vol. 12, no. 2, pp. 1224-1237, 2021.

[4] W. Huang, **W. Zheng* (Corresponding Author, Co-first Author)**, D. J. Hill, "Distributionally Robust Optimal Power Flow in Multi-Microgrids with Decomposition and Guaranteed Convergence," *IEEE Transactions on Smart Grid,* vol. 12, pp. 43-55, 2021. (**ESI Highly Cited Paper**)

[5] **W. Zheng**, Z. Li* and H. Zhou. "Efficient Robust Look-Ahead Dispatch Incorporating Critical Region Preparation in Gap Time", *IEEE Transactions on Power Systems*, vol. 36, pp. 4840-4843, 2021.

[6] **W. Zheng***, W. Huang, D. J. Hill, "A Deep Learning-based General Robust Method for Network Reconfiguration in Three-Phase Unbalanced Active Distribution Networks," *International Journal of Electrical Power & Energy Systems,* vol. 120, p. 105982, 2020.

[7] **W. Zheng**, W. Wu, A. Gomez-Exposito, et al. "Distributed Robust Bilinear State Estimation for Power Systems with Nonlinear Measurements," *IEEE Transactions on Power Systems,* vol. 32, pp. 499-509, 2017.

- **Efficient distributed optimization algorithms**

[8] **W. Zheng**, W. Wu*, B. Zhang, H. Sun, et al. "A Fully Distributed Reactive Power Optimization and Control Method for Active Distribution Networks," *IEEE Transactions on Smart Grid,* vol. 7, pp. 1021-1033, 2016. (**ESI Highly Cited Paper, 400+ citations**)

[9] **W. Zheng**, W. Wu*, "An Adaptive Distributed Quasi-Newton Method for Power System State Estimation," *IEEE Transactions on Smart Grid,* vol. 10, no. 5, pp. 5114-5124, 2019.

[10] **W. Zheng**, Z. Li* and Y. Hou. "A Dynamic Equivalent Model for District Heating Networks: Formulation, Existence and Application in Distributed Electricity-Heat Operation," *IEEE Transactions on Smart Grid*, vol. 12, no. 3, pp. 2685-2695, 2021.

[11] **W. Zheng***, J. Zhu, et al. "Distributed Dispatch of Integrated Electricity-Heat Systems With Variable Mass Flow," *IEEE Transactions on Smart Grid*, vol. 14, pp. 1907-1919, 2023. (**ESI Top 0.1% Hot Paper, ESI Highly Cited Paper**)

[12] **W. Zheng*** and D. J. Hill, "Distributed Real-Time Dispatch of Integrated Electricity and Heat Systems with Guaranteed Feasibility," *IEEE Transactions on Industrial Informatics*, vol. 18, no. 2, pp. 1175-1185, 2022. (**ESI Highly Cited Paper**)

[13] **W. Zheng***, W. Wu, Z. Li, H. Sun and Y. Hou. "A Non-Iterative Decoupled Solution for Robust Integrated Electricity-Heat Scheduling Based on Network Reduction," *IEEE Transactions on Sustainable Energy*, vol. 12, no. 2, pp. 1473-1488, 2021.

[14] **W.Zheng,** H. Lu, et al. "Distributed Energy Management Of Multi-Entity Integrated Electricity And Heat Systems: A Review of Architectures, Optimization Algorithms, and Prospects," *IEEE Transactions on Smart Grid*, vol. 15, pp. 1544-1561, 2024. (**ESI Highly Cited Paper**)

- **Incentive-compatible multi-stakeholder coordination mechanism**

[15] **W. Zheng***, S. Xu, "Participation of Strategic District Heating Networks in Electricity Markets: An Arbitrage Mechanism and Its Equilibrium Analysis," *Applied Energy*, vol. 350, Art. No. 121732, 2023.

[16] **W. Zheng**, S. Xu, H. Lu, W. Wu*, J. Zhu. "Trading mechanism for social welfare maximization in integrated electricity and heat systems with multiple self-interested stakeholders," *Energy*, vol. 306, Art. No. 132267, 2024.

[17] **W. Zheng*** and D. J. Hill, "Incentive-Based Coordination Mechanism for Distributed Operation of Integrated Electricity and Heat Systems," *Applied Energy*, vol. 285, Art. No. 116373, 2021.

[18] **W. Zheng***, H. Lu, and J. Zhu. "Incentivizing Cooperative Electricity-Heat Operation: A Distributed Asymmetric Nash Bargaining Mechanism," *Energy*, vol. 280, Art. No. 128041, 2023.

[19] **W. Zheng***, W. Wu, D. J. Hill. "A Multi-Parametric Programming based Analytic Method to Compute Consumer Offer Curve for Reserves", *Journal of Modern Power Systems and Clean Energy*, vol. 10, pp. 542-546, 2022.

[20] J. Zhu, H. Dong and **W. Zheng* (Corresponding Author)**, et al. "Review and Prospect of Data-Driven Techniques for Load Forecasting in Integrated Energy Systems," *Applied Energy*, vol. 321, p. 119269, 2022. (**ESI Highly Cited Paper, 165 citations**)

[21] **W. Zheng**, S. Xu, J. Zhu*, "Scalable Contract Design for Virtual Power Plant with Numerous Distributed Energy Resources Considering Electricity-Carbon-Green Certificate Multiple Market Trading," *CSEE Journal of Power and Energy Systems*, in press, 2025.

Award

[1] **Outstanding Scientific Research Output First Class Award**（中国教育部高等学校科学研究优秀成果自然科学一等奖） for contribution in *Theory and Method for Smart Grid Energy Management,* rank 7/7, Ministry of Education, China — 2021.03

[2] **Guangdong Electricity Science and Technology Award - Youth Science and Technology Award** (5 recipients provincewide, 广东电力科学技术奖优秀青年科技人才奖) for contribution in *Market-Based Operation and Dispatch of Power Systems*, rank 1/1, Guangdong Society for Electrical Engineering — 2024.10

[3] **World's Top 2% Scientists**, Elsevier and Stanford University — Since 2023

[4] **China Computer Federation (CCF)–Tencent Rhino Bird Fund Excellence Award** (1 recipient nationwide, 中国计算器学会-腾讯犀牛鸟基金卓创奖), CCF and Tencent — 2023.10

[5] **IEEE Technical Committee Working Group Recognition Award for Outstanding Technical Report**, IEEE — 2024.01

[6] **Excellent Associate Editor,** Protection and Control of Modern Power Systems — 2025.01

[7] **Excellent Lead Guest Editor**, IET Energy Conversion and Economics (2 recipients worldwide) — 2023.12

[8] **Excellent Head-Teacher of the Class**, South China University of Technology — 2022.09

[9] **Outstanding Graduate in Beijing** (top 5% honor in Beijing), Beijing Municipal Education Commission — 2018.07

[10] **National Scholarship for PhD Students** (top 0.2% at Tsinghua), Ministry of Education, China — 2017.12

[11] **Outstanding Reviewer for Applied Energy**, Elsevier — 2018.06

[12] **Outstanding Reviewer for International Journal of Electrical Power and Energy Systems**, Elsevier — 2017.10

[13] **Excellent Graduate**, Tsinghua University — 2013.07

[14] **Outstanding Thesis Award**, Tsinghua University — 2013.07

Teaching

- **The University of Hong Kong**

[1] *Advanced Topics in Modern Power Systems*, 2020 Spring, 2021 Spring, 36 credit hours.

- **South China University of Technology**

[2] *Distributed Smart Grid Energy Management*, Education Reform Project, 10,000 CNY, 2024.10-2025.09, PI. （华南理工大学科教融合型教育改革项目）
[3] *Production and Utilization of Electric Power*, 2021 Fall, 2022 Fall, 2023 Fall, 2024 Fall, 22 credit hours.
[4] *Electric Circuit and Electronics*, 2021 Fall, 2022 Fall, 2023 Fall, 192 credit hours.
[5] *Power System Analysis*, 2023 Fall, 2024 Fall, 72 credit hours.
[6] *Course Design of Power System*, 2023 Fall, 2024 Fall, 48 credit hours.
[7] *Diploma Thesis Project Tuition*, 2021, 2022, 2024, 48 credit hours.
[8] *New Type Power System Analysis and Optimal Dispatch*, 2024 Spring, 8 credit hours.
[9] *Optimal Power Flow for Large-Scale Power System* (Graduate Course), 2024 Spring, 16 credit hours.
[10] My Students' Honors: *National Scholarship for Graduate Student* (Hao Lu 2023' and Siyu Xu 2024', Top 2% Honor in the university), *Outstanding Thesis Award* (Yan Bai 2022', Jie Wang 2022' and Endu Xu 2023'), *Outstanding Graduate* (Hao Lu 2024').

Volunteer Service

- **Academic:**

[1] Associate Editor, *IEEE Transactions on Smart Grid*, 2025.04-now
[2] Associate Editor, *IEEE Power Engineering Letters*, 2025.04-now
[3] Associate Editor, *Applied Energy*, 2022.11-now
[4] Associate Editor, *IEEE Systems Journal*, 2022.10-now
[5] Associate Editor, *CSEE Journal of Power and Energy Systems*, 2019.06-now
[6] Associate Editor, *IET Renewable Power Generation*, 2022.03-2024.12
[7] Associate Editor, *Protection and Control of Modern Power Systems*, 2024.01-now
[8] Young Editorial Board Member, *Power System Protection and Control* (in Chinese, 电力系统保护与控制), 2024.01-now
[9] Young Editorial Board Member, *Electric Power Automation Equipment* (in Chinese, 电力自动化设备), 2024.01-now
[10] Young Editorial Board Member, *iEnergy*, 2024.11-now
[11] Secretary, *IEEE PES SBLC (China) Technical Committee*, 2021.12-2024.12
[12] Standing Director, *IEEE PES China Satellite Technical Committee*, 2025.04-2026.12
[13] Task Force Member, *IEEE PES Energy Internet Coordinating Committee*, 2021.3-2021.12
[14] Committee Member, *China Electrotechnical Society (CES) Active Distribution Network and Distributed Generation Technical Committee*, 2024.09-2029.12
[15] Committee Member, *China Electrotechnical Society (CES) Power System Control and Protection Technical Committee*, 2025.04-2030.12
[16] Task Force Member, *Chinese Society for Electrical Engineering (CSEE) Distributed Generation and Smart Distribution Technical Committee*, 2024.09-now
[17] Distinguished Expert, *State Grid Shandong Electric Power Company*, 2023.01-2025.12
[18] Invited Supervisor of Rhino-Bird Middle School Science Talent Fostering Program, *Tecent*, 2023.12-now
[19] Reviewer of over 40 SCI journals (including IEEE TFS/TPWRS/TSG/TSTE, IET GTD/RPG, EPSR, ISJ, etc), top conferences (including IEEE PESGM and IASAM, etc) and grants including NSFC research programs
[20] Program/Session Chairs of several IEEE conferences such as CEEPE 2023, ICEPG 2022, ICPEA 2022, etc.

- **Non-academic:**

[21] Director of Tsinghua Alumni Association, 2018-2023
[22] Commissary in charge of organization in the Faculty Party Branch, 2021.11-2025.07

[23] Secretary in the Student Party Branch, 2021.09-2024.06
[24] Guangdong poverty alleviation charity activities, each year in 2021-2024
[25] Volunteer in fighting against COVID-19, 2022
[26] University service: interviewer for graduate entrance exams, organizer for important meetings, etc. Full marks in each annual evaluation

Issued Patents

[1] Interior-Point Method Based Robust State Estimation for Power System. Chinese Patent No. 201310367682.5
[2] Distributed Self-Disciplined Voltage Control for Active Distribution Networks. Chinese Patent No. 201510092162.7
[3] Distributed Self-Disciplined Economic Dispatch for Active Distribution Networks. Chinese Patent No. 201510070544.X
[4] Decentralized Robust Bilinear State Estimation for Multi-Area Power System. Chinese Patent No. 201610067806.1
[5] Method and Device for Estimating State of Power System. US patent No. US 20170220521
[6] Distributed congestion dispatch method for distribution network considering distributed generation, Chinese Patent No. 201811145545.6
[7] Distributed congestion control method for distribution network considering demand response, Chinese Patent No. 201811168489.8
[8] Network equivalent for district heating networks considering temperature quasi-dynamics, Chinese Patent No. 202110515553.0
[9] Non-iterative decomposition method for distributed robust electricity-heat scheduling based on network reduction, Chinese Patent No. 202110568689.8
[10] Real-time dispatch method for integrated electricity and heat systems with feasibility guarantee, Chinese Patent No. 202210377586.8

Professional Qualifications

[1] Senior Member, *IEEE*, 2023.06
[2] Senior Member, *CSEE*, 2023.08
[3] Senior Member, *CES*, 2022.10
[4] Chartered Engineer, *UK Engineering Council*, 2025.02
[5] Professional Engineer in Electrical Engineering, *Chinese Society of Engineers*, 2024.10
[6] Chartered Financial Analyst (CFA) Level III Candidate, *CFA Institute*, 2017.10
[7] Teacher Qualification, *Department of Education of Guangdong Province*, 2021.10

Group Member

Students:
[1] Boyang SHAN, MPhil Student
[2] Xumin DUAN, MPhil Student
[3] Chenhao ZHAO, MPhil Student
[4] Liangtao WENG, MPhil Student
[5] Musen LIN, MPhil Student
[6] Yushen ZHENG, MPhil Student
Alumni:
[7] Hao LU, Master, Awardee of National Scholarship and Excellent Graduate @ SCUT. Current employment: State Grid
[8] Siyu XU, Master, Awardee of National Scholarship and Excellent Graduate @ SCUT. Current employment: China Southern Grid
[9] Yan BAI, Bachelor, Awardee of Outstanding Thesis @ SCUT. Current employment: PhD student of Chinese University of Hong Kong
[10] Jie WANG, Bachelor. Current employment: Master student of Zhejiang University

[11] Junfeng LI, Bachelor. Current employment: China Southern Grid
[12] Fengning GUO, Bachelor. Current employment: China Southern Grid