Yu Zhang

Ph.D. Candidate in Control Science & Engineering

Huazhong University of Science and Technology; visiting Nanyang Technological University

N2505927K@e.ntu.edu.sg | yuzhang_hust@hust.edu.cn | Homepage

Postdoctoral search: expecting to complete my Ph.D. in late 2026 and actively seeking opportunities in control, optimization, and energy systems starting in Spring 2027.

Profile

Ph.D. researcher working on predefined-time optimization, distributed control, and cyber-resilient operation for hybrid AC/DC microgrid clusters. My work connects rigorous convergence guarantees with practical energy-system objectives including economic dispatch, voltage/frequency restoration, power-flow optimization, and attack-resilient control.

Education

Nanyang Technological University — Singapore
Visiting Scholar/Student, School of Electrical and Electronic Engineering — 2026–Present
Advisors: Prof. Hung Dinh Nguyen and Prof. Changyun Wen

Huazhong University of Science and Technology — Wuhan, China
Ph.D. in Control Science & Engineering — 2020–Present
Advisor: Prof. Yan-Wu Wang

Taiyuan University of Technology — Taiyuan, China
B.S. in Electrical Engineering — 2016–2020
Advisor: Prof. Xiao-Ming Chang

Research System

Economic dispatch	Smooth reconstruction penalty functions and distributed predefined-time economic dispatch for cost minimization, power balance, transmission loss, and generation constraints.
Cooperative control	Predefined-time voltage/frequency restoration and global power sharing for DC and hybrid AC/DC microgrids under unknown load power.
Power-flow optimization	Phase-angle and voltage-safe multi-objective optimization for networked AC/DC microgrids with local-information implementation.
Resilient control	Practical predefined-time resilient control against DoS and FDI attacks in single and networked DC microgrids.

Selected Publications

1. **Yu Zhang, Yan-Wu Wang, Xiao-Kang Liu, Guan-Nan Yu, and Yuehua Huang**. Optimal Phase Angle Control for Interconnected AC Microgrids. *Automatica*, 2026.
2. **Yu Zhang, Yan-Wu Wang, Zhichun Yang, and Xiao-Kang Liu**. From Single to Networked: Practical Predefined-Time Resilient Control of DC Microgrids under DoS and FDI Attacks. *IEEE Transactions on Industry Applications*, 2026.
3. **Yu Zhang, Yan-Wu Wang, Jiang-Wen Xiao, and Xiao-Kang Liu**. Distributed Predefined-Time Optimal Economic Dispatch for Microgrids. *Automatica*, 2024.
4. **Yan-Wu Wang, Yu Zhang, Xiao-Kang Liu, and Xia Chen**. Distributed Predefined-Time Optimization and Control for Multi-Bus DC Microgrid. *IEEE Transactions on Power Systems*, 2024. Student first author.
5. **Yu Zhang, Yan-Wu Wang, Xiao-Kang Liu, Wu Yang, and Shu-Ming Liang**. Distributed Predefined-Time Control for Hybrid AC/DC Microgrid. *IEEE Transactions on Industrial Electronics*, 2023.
6. **Yu Zhang, Yan-Wu Wang, Jiang-Wen Xiao, and Xiao-Kang Liu**. Predefined-Time Secondary Control for DC Microgrid. *IEEE Transactions on Industrial Electronics*, 2022.

Additional Publications

1. **Yu Zhang, Yan-Wu Wang, and Xiao-Kang Liu**. Distributed Load-sharing and Loss Optimization within Voltage Safety Constraints for Meshed DC Microgrid. *IEEE/CAA Journal of Automatica Sinica*, 2025.
2. **Yu Zhang (corresponding author), et al.**. FT-ESO Based Fixed-Time Secondary Control for DC Microgrids with Unknown External Disturbances. *IEEE Transactions on Smart Grid*, accepted, 2026.
3. **X. Yang, Yu Zhang, et al.**. Distributed Power Sharing Control for Islanded AC Microgrids With Quantized State. *IEEE Transactions on Industrial Electronics*, 2025.
4. **Yu Zhang, et al.**. Energy-Like Stability of Interconnected Grid-Forming Inverters with Potential-Sensitive Virtual Inertia. *IEEE Power & Energy Society General Meeting*, accepted, 2026.
5. **Yu Zhang, Ke-Xin Ma, Ming-Yu Zhu, and Xiao-Kang Liu**. Optimal Voltage Scheduling under Safety Constraints for Multi-bus DC Microgrid. *14th Asian Control Conference*, 2024.
6. **Yu Zhang (corresponding author), et al.**. Distributed Event-Triggered Coordinated Voltage-Constrained and Current-Sharing Control for Islanded DC Microgrids. *IEEE Asia-Pacific Power and Energy Engineering Conference*, 2024.
7. **Yu Zhang, Xiao-Kang Liu, Zheng Wu, and Lan-Tao Xing**. Distributed Predefined-Time Secondary Control for AC Microgrid. *49th Annual Conference of the IEEE Industrial Electronics Society*, 2023.
8. **Y. Wang, Yu Zhang, et al.**. Distributed Event-Triggered Control for Hybrid AC/DC Microgrids with Quantized State. *Youth Academic Annual Conference of Chinese Association of Automation*, 2025.
9. **Z. Wu, Yu Zhang, et al.**. Slow State Based Consensus for Two Time-Scale Agent Networks under Directed Graphs. *Chinese Control Conference*, 2022.

Working Paper

Yu Zhang, et al. Physics-enhanced decision transformer method for hybrid energy storage system management. Working paper/preprint in preparation for high-impact interdisciplinary venues.

Projects

- **Hosted**, HUST Innovation Research Institute Technology Innovation Fund: optimal frequency control strategy of microgrid based on distributed energy storage, 2024.09–2025.09.
- **Participated**, Hubei Province Technology Innovation Plan Key R&D Project: coordinated control and optimization for smart microgrids based on energy storage clusters, 2025.08–2027.08. Responsible for multi-timescale cooperative control of energy storage under emergency scenarios.
- **Participated**, NSFC Key Project: distributed cooperative control and intelligent decision-making of regional energy Internet, 2023.01–2027.12.

Honors & Awards

2025	National Scholarship for Doctoral Students.
2025	"Huawei Cup" Artificial Intelligence Innovation Competition, Second Prize. Topic: AI-model-driven safety warning and health monitoring system for new-energy vehicle power batteries.
2025	Dual-Carbon Innovation and Creativity Competition, Third Prize. Topic: EV energy-storage multi-scale coordinated optimization and intelligent regulation.
2025	2024 Hubei Province Excellent Science and Technology Paper.
2024	20th National Conference on Complex Networks, Best Student Paper.
2024	Advances in Engineering, Key Scientific Article.
2024	Huichuan Cup National Intelligent Automation Innovation Competition, National Third Prize.
2022	National Scholarship for Master's Students; 34th China Control and Decision Conference, Most Popular Academic Work Award.
Patent	Five authorized Chinese invention patents, including ZL202110837323.6.

Skills

Theory: predefined-time control, distributed optimization, resilient control, multi-objective power-flow optimization.
Learning: reinforcement learning, PPO algorithms, reward scaling design, physics-informed reinforcement learning, decision transformers.
Tools: Python, MATLAB/Simulink, power electronics modeling, PCB design, high-precision industrial controller development.

Academic Travel

17 conference presentations and academic events across 13 cities, 2021–2025, including Annual Conference of the IEEE Industrial Electronics Society, Asian Control Conference, IEEE/CAA Journal of Automatica Sinica Conference, IEEE Active Disturbance Rejection Control Workshop, and other control/automation venues.