

Mengxiang Liu

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Work & Education Experiences

Imperial College London, London, UK

Apr. 2023–

Research Associate (PostDoc), Department of Electrical and Electronic Engineering

Supervised by Dr. **Fei Teng**

Imperial College London, London, UK

Nov. 2022–Jan. 2023

Visiting Scholar, Department of Electrical and Electronic Engineering

Supervised by Dr. **Fei Teng**

Zhejiang University, Hangzhou, China

Oct. 2022–Mar. 2023

Research Assistant, College of Control Science and Engineering

Supervised by Prof. **Jiming Chen**

Zhejiang University, Hangzhou, China

Sept. 2017–Sep. 2022

PhD, College of Control Science and Engineering

Thesis “Proactive Detection and Localization Against Stealthy Attacks in Power Distribution Grid”

Co-supervised by Prof. **Jiming Chen**, Prof. **Peng Cheng**, Prof. **Ruilong Deng**, and Dr. **Chengcheng Zhao**

Tongji University, Shanghai, China

Sept. 2013–Jun. 2017

B.E, College of Control Science and Engineering

Thesis “The Design of Industrial Honeypot Based on Programmable Logic Controller”

Research Interests

Cyber Resiliency of DER-based Power Systems, Active Defense, Attack Detection, Impact Mitigation, Recovery Schedule

Publications

Preprint.....

S. Peng, **M. Liu**, K. Zuo, W. Tan, R. Deng, “Stealthy Data Integrity Attacks Against Grid-tied Photovoltaic Systems,” *IEEE International Conference on Industrial Cyber Physical System (ICPS)*, to appear in 2023.

W. Ma, **M. Liu**, G. Hong, S. Yang, R. Deng, “Grid-Metaverse: The Path From Digital Twins and Prototype Tests on DC Microgrids,” *IEEE International Conference on Metaverse Computing, Networking and Applications (MetaCom)*, to appear in 2023.

H. Zhu, **M. Liu**, C. Fang, R. Deng, and P. Cheng, “A Practical Watermarking Method Considering Noises in Industrial Control Systems,” *IEEE Transactions on Information Forensics & Security*, Minor Revision.

Journal.....

[J1] **M. Liu**, C. Zhao, Z. Zhang, R. Deng, P. Cheng, and J. Chen, “Converter-based Moving Target Defense Against Deception Attacks in DC Microgrids,” *IEEE Transactions on Smart Grid*, vol. 13, no. 5, pp. 3984-3996, Sept. 2022.

[J2] **M. Liu**, C. Zhao, Z. Zhang, and R. Deng, “Explicit Analysis on Effectiveness and Hiddenness of Moving Target Defense in AC Power Systems,” *IEEE Transactions on Power System*, vol. 37, no. 6, pp. 4732-4746, Nov. 2022.

[J3] **M. Liu**, P. Cheng, C. Zhao, R. Deng, W. Wang, and J. Chen, “False Data Injection Attacks and the Distributed Countermeasure in DC Microgrids,” *IEEE Transactions on Control of Network Systems*, vol. 9, no. 4, pp. 1962-1974, Dec. 2022.

[J4] **M. Liu**, C. Zhao, Z. Zhang, R. Deng, P. Cheng, and J. Chen, “PDDL: Proactive Distributed Detection and Localization Against Stealthy Deception Attacks in DC Microgrids,” *IEEE Transactions on Smart Grid*, vol. 14, no. 1, pp. 714-731, Jan. 2023.

Conference

- [C1] **M. Liu**, C. Zhao, Z. Zhang, R. Deng, and P. Cheng, "Analysis of Moving Target Defense in Unbalanced and Multiphase Distribution Systems Considering Voltage Stability," *IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*, 2021, pp. 207-213.
- [C2] **M. Liu**, Z. Jin, J. Xia, M. Sun, R. Deng, and P. Cheng, "Demo Abstract: A HIL Emulator-Based Cyber Security Testbed for DC Microgrids," *IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, 2021, pp. 1-2.
- [C3] **M. Liu**, Z. Cheng, Z. Zhang, M. Sun, R. Deng, P. Cheng, and M. Chow, "A Multi-Agent System Based Hierarchical Control Framework for Microgrids," *IEEE Power & Energy Society General Meeting (PESGM)*, 2021, pp. 1-5.
- [C4] **M. Liu**, C. Zhao, R. Deng, P. Cheng, W. Wang, and J. Chen, "Nonzero-Dynamics Stealthy Attack and its Impacts Analysis in DC Microgrids," *IEEE American Control Conference (ACC)*, 2019, pp. 3922–3927.
- [C5] Z. Jin, **M. Liu**, R. Deng, and P. Cheng. Distributed Data Recovery Against False Data Injection Attacks in DC Microgrids, *IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*, 2022.
- [C6] S. Peng, **M. Liu**, and R. Deng. Stealthy Data Integrity Attacks Against Grid-tied Photovoltaic Systems, accepted by *IEEE International Conference on Industrial Cyber Physical System (ICPS)*, 2023.
- [C7] W. Ma, **M. Liu**, G. Hong, S. Yang, and R. Deng. Grid-Metaverse: The Path From Digital Twins and Prototype Tests on DC Microgrids, submitted to *IEEE International Conference on Metaverse Computing, Networking and Applications (MetaCom)*, 2023.
- [C8] X. Li, **M. Liu**, R. Zhang, P. Cheng, and J. Chen, Demo Abstract: An industrial control system testbed for the encrypted controller, *ACM/IEEE 9th International Conference on Cyber-Physical Systems (ICCPs)*, 2018, pp. 343-344.

Awards

Graduate Scholarship (Top 5%), Zhejiang University	2022
Outstanding Graduate Student Award, Zhejiang University	2018, 2019
National Inspirational Scholarship (Top 3%), Ministry of Education of China	2013, 2014
Second-Class Scholarship (Top 10%), Tongji University	2013, 2014

Professional Presentation

ZJU National Academic Forum for PhD Candidates	Dec. 2022
Online Workshop	
IEEE SmartGridComm	Oct. 2021
Virtual Conference	
IEEE PESGM	Jul. 2021
Virtual Conference	
IEEE INFOCOM WKSHPS	May. 2021
Virtual Conference	
IEEE ACC	Jul. 2019
Philadelphia, USA	

Academic Services

Reviewer for Journals: *Automatica*, *IEEE TAC*, *IEEE TCNS*, *IEEE TSG*, *IEEE TPS*, *IEEE TII*, *IET Generation, Transmission & Distribution*, *Wireless Networks*

Reviewer for Conferences: *IEEE EPEC 2022*, *IFAC World Congress 2020*, *IEEE PESGM 2020*, *IEEE ACC 2019*, *IEEE CDC 2019*

Co-organizer for Special Session: "Cybersecurity of the Future DER-based Power Grid" in *IEEE ICPS 2023*

TPC Member for Conferences: *IEEE SmartGridComm 2022*, *IEEE GLOBECOM 2021*

Hardware and Software Skills

Emulator: Typhoon HIL 602+

Programming : C/C++, MATLAB, Latex

OS: Windows, Linux