Guanxiong Shen

210096
Southeast University, Nanjing, China
gxshen@seu.edu.cn
https://gxhen.github.io/

Career

Southeast University — Nanjing, China
Job Title: Associate Professor — *Sept 2023 – present*
School of Cyber Science and Engineering

Education

University of Liverpool — Liverpool, United Kingdom
Ph.D. in Electrical Engineering and Electronics — *2019 – 2023*
Thesis: Deep learning enhanced radio frequency fingerprint identification for LoRa
Supervisors: Dr. Junqing Zhang and Prof Alan Marshall

Heriot-Watt University — Edinburgh, United Kingdom
B.Eng. in Telecommunication Engineering — *2015 – 2019*
Honours of the First Class
Thesis Topic: Deep learning for wireless channel estimation
Supervisor: Dr. Muhammad R.A. Khandaker

Xidian University — Xi'an, China
B.Eng. in Telecommunication Engineering — *2015 – 2019*

Research Interests

I focus on cutting-edge research at the intersection of wireless communications, artificial intelligence, and cybersecurity. My current research interests include but are not limited to:

- Machine Learning-aided Radio Frequency Fingerprinting
- Information Hiding in Wireless Systems
- Machine Learning Applications at Wireless PHY layer
- Wireless Sensing.

Journal Publications

1. X. Li, L. Chen, **Guanxiong Shen**, K. Zhao, Z. Gu, Q. Ma, J. W. You*, and T. J. Cui*, "Protocol-agnostic meta key distribution enabled by space-time metasurface for encrypted wireless communications," *Advanced Science*, 2025.
2. J. Ma, J. Zhang*, **Guanxiong Shen**, L. Peng, and A. Marshall, "Towards channel-robust and receiver-independent radio frequency fingerprint identification," *IEEE Transactions on Information Forensics and Security*, 2025.
3. P. Yin, L. Peng*, **Guanxiong Shen**, J. Zhang, M. Liu, H. Fu, A. Hu, and X. Wang, "Multi-channel CNN-based open-set RF fingerprint identification for LTE devices," *IEEE Transactions on Cognitive Communications and Networking*, 2024.
4. **Guanxiong Shen**, J. Zhang*, X. Wang, and S. Mao, "Federated radio frequency fingerprint identification powered by unsupervised contrastive learning," *IEEE Transactions on Information Forensics and Security*, 2024.
5. J. Zhang*, F. Ardizzon, M. Piana, **Guanxiong Shen**, and S. Tomasin, "Physical layer-based device fingerprinting for wireless security: From theory to practice," *IEEE Transactions on Information Forensics and Security*, 2024, Survey Paper.
6. **Guanxiong Shen**, J. Zhang*, A. Marshall, R. Woods, J. Cavallaro, and L. Chen, "Towards receiver-agnostic and collaborative radio frequency fingerprint identification," *IEEE Transactions on Mobile Computing*, 2024, accepted.
7. R. Pan, H. Chen, **Guanxiong Shen**, and H. Chen, "Residual channel boosts contrastive learning for radio frequency fingerprint identification," *IEEE Wireless Communications Letters*, 2024.
8. **Guanxiong Shen** and J. Zhang*, "Exploration of transferable deep learning-aided radio frequency fingerprint identification systems," *Security and Safety*, 2024.
9. **Guanxiong Shen**, J. Zhang*, and A. Marshall, "Deep learning-powered radio frequency fingerprint identification: Methodology and case study," *IEEE Communications Magazine*, 2023.

10. J. Zhang*, **Guanxiong Shen**, W. Saad, and K. Chowdhury, "Radio frequency fingerprint identification for device authentication in the internet of things," *IEEE Communications Magazine*, 2023.
11. **Guanxiong Shen**, J. Zhang*, A. Marshall, M. Valkama, and J. Cavallaro, "Towards length-versatile and noise-robust radio frequency fingerprint identification," *IEEE Transactions on Information Forensics and Security*, vol. 18, pp. 2353–2365, 2023.
12. G. Yin, J. Zhang*, **Guanxiong Shen**, and Y. Chen, "FewSense, towards a scalable and cross-domain Wi-Fi sensing system using few-shot learning," *IEEE Transactions on Mobile Computing*, 2023.
13. **Guanxiong Shen**, J. Zhang*, A. Marshall, and J. Cavallaro, "Towards scalable and channel-robust radio frequency fingerprint identification for LoRa," *IEEE Transactions on Information Forensics and Security*, vol. 17, pp. 774–787, Feb. 2022.
14. H. Ruotsalainen, **Guanxiong Shen**, J. Zhang, and R. Fujdiak, "LoRaWAN physical layer-based attacks and countermeasures, a review," *Sensors*, vol. 22, no. 9, p. 3127, 2022.
15. **Guanxiong Shen**, J. Zhang*, A. Marshall, L. Peng, and X. Wang, "Radio frequency fingerprint identification for LoRa using deep learning," *IEEE Journal on Selected Areas in Communications*, vol. 39, no. 8, pp. 2604–2616, Aug. 2021.

Conference Publications

1. J. Ma, J. Zhang*, **Guanxiong Shen**, L. Peng, and A. Marshall, "Towards channel-robust radio frequency fingerprint identification using contrastive learning," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, IEEE, 2025.
2. J. Ma, J. Zhang*, **Guanxiong Shen**, A. Marshall, and C.-H. Chang, "White-box adversarial attacks on deep learning-based radio frequency fingerprint identification," in *Proc. IEEE International Conference on Communications (ICC)*, IEEE, 2023.
3. **Guanxiong Shen**, J. Zhang*, A. Marshall, M. Valkama, and J. Cavallaro, "Radio frequency fingerprint identification for security in low-cost IoT devices," in *Proc. Asilomar Conference on Signals, Systems, and Computers*, Virtual Conference: IEEE, Oct. 2021.
4. **Guanxiong Shen***, J. Zhang, A. Marshall, L. Peng, and X. Wang, "Radio frequency fingerprint identification for LoRa using spectrogram and CNN," in *Proc. IEEE International Conference on Computer Communications (INFOCOM)*, Virtual Conference: IEEE, May 2021.

Teaching Experience

Southeast University — Nanjing, China
Teacher — *2024/2025*

- B5710312 Mobile Communication and Security. (Taught in English)
- Undergraduate course

University of Liverpool — Liverpool, UK
Lab Demonstrator — *2020/2021*

- ELEC431 Software Engineering and Programming.
- Instruct M.Sc. students to complete the Matlab course design.

Funding

National Natural Science Foundation of China Youth Funding

- 2024-2027, Principal Investigator
- Topic: RF fingerprint identification for vehicle digital keys based on physical layer characteristics

Huawei University-Enterprise Cooperation Funding

- 2025-2026, Principal Investigator
- Topic: RF fingerprint identification for WiFi

Supervision

Undergraduate Students Mr Yuetong Wang, Mr Jiamu Guo, Mr Zhiyao Wu, Mr Runheng Lu, Miss Lu Li, Mr Shang Xu
MPhil Students Mr Chenyang Wu, Mr Xiangcong Li, Mr Jiahua Zou, Mr Jiamu Guo, Mr Yang Song, Mr Dacheng Shang, Mr Wentao Xiao, Mr Chenshuo Tang, Miss Lu Yang
Ph.D. Students Mr Rui Pan, Mr Hailang Jia

Professional Activities

Workshop Co-Chair

- IEEE ICC 2026 Workshop on Machine Learning and Deep Learning for Wireless Security
- IEEE GLOBECOM 2025 Workshop on Machine Learning and Deep Learning for Wireless Security
- IEEE ICC 2025 Third Workshop on Machine Learning and Deep Learning for Wireless Security
- IEEE GLOBECOM 2024 Second Workshop on Machine Learning and Deep Learning for Wireless Security
- IEEE ICC 2024 First Workshop on Machine Learning and Deep Learning for Wireless Security

TPC Member

- IEEE INFOCOM 2025 Third DeepWireless Workshop: Deep Learning for Wireless Communications, Sensing, and Security
- IEEE ACM WiseML 2026 Workshop on Wireless Security and Machine Learning
- IEEE WCNC 2026 Workshop on Physical Layer Security for Wireless Communications
- IEEE ICNC 2026 AI and Machine Learning for Communications and Networking
- IEEE INFOCOM 2025 Third DeepWireless Workshop: Deep Learning for Wireless Communications, Sensing, and Security
- IEEE WCNC 2025 Workshop on Physical Layer Security for Wireless Communications
- IEEE INFOCOM 2024 Second DeepWireless Workshop: Deep Learning for Wireless Communications, Sensing, and Security