Hanqing Guo

Education

2019–Now **Ph.D.**, *Michigan State University*, East Lansing, *3.9/4.0*.
Computer Science and Engineering

2017–2019 **Master**, *Ball State University*, Muncie, *4.0/4.0*.
Computer Science

2011–2015 **Bachelor**, *Chongqing University of Posts and telecommunications*, Chongqing, *3.2/4.0*.
Communication Engineering

Research Area

2021.3–Now **Query Efficient Black-box Adversarial Attacks on Voice Assistants**.
We propose a phoneme-inject based query efficient black-box attack to generate audio perturbations quickly, then test our proposed attacks on 4 commercial speech-to-text APIs and voice assistants.

2021.3–2021.12 **Inaudible Voice Command Injection via Charging Cables**.
We design a new attack called GhostTalk, which exploits the I/O ports on charging cable audio to inject voice commands and eavesdrop private information for the charged smart phones.

2020.9–2021.9 **Advance LoRa Demodulation Scheme**.
An AI-enhanced Lora signal demodulation scheme that empower the communicate distance and lifetime of LoRa node.

2020.6–Now **Secured and Privacy Protected Voice Selection System**.
A selective jamming system to prevent users' voice from being eavesdropped while not abusing others communication.

2020.5–Now **Speaker Recognition with Ultrasonic Signals**.
Design advanced and secured speaker recognition algorithm with using ultrasonic signals.

2018.6–2019.5 **Real-time human activities recognition by using 3D radar image reconstruction and LSTM**.
Design a signal processing algorithm to analyze phase shift of raw signals, thus compute reflection power from any spatial direction to visualize the human motion.

2017.1–2018.5 **DSIC: Deep Learning based Self-Interference Cancellation for In-Band Full Duplex Wireless**.
Propose a real-time non-linear self-interference cancellation solution based on **deep learning**, and implement the design on a USRP testbed

Publication

Paper *Y. Wang, **H. Guo**, Q. Yan. GhostTalk: Interactive Attack on Smartphone Voice System Through Power Line. Accepted by **NDSS 2022***

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Paper *X. Zhang, **H. Guo**, J. Mariani, L. Xiao. U-Star: An Underwater Navigation System based on Passive 3D Optical Identification Tags. Accepted by **Mobicom 2022***

Paper *C. Li, **H. Guo**, S. Tong, X. Zeng, Z. Cao, M. Zhang, Q. Yan, L. Xiao, J. Wang and Y. Liu. NELoRa: Towards Ultra-low SNR LoRa Communication with Neural-enhanced Demodulation. Published by **SenSys 2021***

Paper *N. Ivanov, **H. Guo** and Q. Yan. Rectifying Administrated ERC20 Tokens. Published by **ICICS 2021***

Paper *Q. Yan, K. Liu, Q. Zhou, **H. Guo** and N. Zhang. SurfingAttack: Interactive Hidden Attack on Voice Assistants Using Ultrasonic Guided Waves. Published by **NDSS 2020***

Paper ***H. Guo**, S. Wu, H. Wang, and M. Daneshmand. DSIC: Deep Learning based Self-Interference Cancellation for In-Band Full Duplex Wireless. arXiv preprint arXiv 1811.01498.2018, , Accepted by IEEE Globecom 2019*

Paper ***H. Guo**, N. Zhang, W. Shi, S. AIQarni, and S. Wu. HICFR: Real Time 3D Indoor Human Image Capturing Based on FMCW Radar. Accepted by IEEE ICME 2019*

Paper *S. Zhu, **H. Guo**, Qiwei Liu, Shaoen Wu, Honggang Wang Indoor Human Activity Recognition Based on Ambient Radar with Signal Processing and Machine Learning, IEEE International Conference on Communications (ICC), Kansas City, MO, USA. May 20-24, 2018*

Paper ***H. Guo**, J. Xu, S. Zhu, and S. Wu. Realtime software defined self-interference cancellation based on machine learning for in-band full duplex wireless communications. International Conference on Computing, Networking and Communications (ICNC), Maui, Hawaii, USA., March 5-8, 2018*

Paper ***H. Guo**, J. Xu, S. Zhu, and S. Wu. In-band full duplex wireless communications and networking for iot devices: Progress, challenges and opportunities. Elsevier Future Generation Computer Systems Journal, accepted, Oct. 2017*

Paper *Q. Liu, **H. Guo**, J. Xu, A. Kageza and S. Wu. Non-contact Non-invasive Heart and Respiration Rates Monitoring with MIMO Radar Sensing, Globecom 2018, Abu Dhabi, UAE, accepted, Dec. 2018*

Paper *J. Xu, **H. Guo**, A. Kageza and S. Wu. Removing background with Semantic Segmentation Based on Ensemble Learning 12th EAI International Conference on Mobile Multimedia Communications, Qingdao, China, June, 2018*

Teaching & Work

2020.9–Now **Teaching Assistant**.
CSE 410: Operating System. C++ programming and Linux/Unix system. CSE 260: Discrete Structures in Computer Science.

2020.1– **Research Assistant**.
2020.9 Research on speech recognition system, security of AI/IOT systems.

2019.9– **Teaching Assistant**.
2020.1 CSE 232: Introduction to Programming II. C++ programming

2017.1– **Research Assistant**.
2019.8 Do wireless communication, machine learning, signal processing related research.

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2015.6– **Global Communications Engineer at Fiberhome Coporation**.
2016.11 My work responsibility includes: design network topology, troubleshoot network problems by Linux commands, and assign route to improve robustness of network

Languages

Python, Java **5 years Experience**
JS,C++ **4 years Experience**

Award

2021 **Best Paper Award** *ACM SenSys 2021*
2019 **Best Paper Award** *IEEE Globecom 2019*
2017 **Outstanding accomplishments graduate student merit** *Ball State University*
2015 **Honorable Mention** *Mathematical Contest in Modeling*

Personality

- **Goal Driven, Courageous, Adventurous, Dependent**

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