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; Research Assistant*, Muncie, *4.0/4.0*.
Computer Science

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

Research Projects

2022.5–Now **Backdoor Attack for Speaker Authentication Models**.
We propose a backdoor attack to attack the speaker verification model in a real-world scenario.

2021.8– **Adversarial Audio Patch Attack**.
2022.5 We propose a spectrogram patch-based adversarial attack to attack the modern automated speech recognition model.

2021.3– **Query Efficient Black-box Adversarial Attacks on Voice Assistants**.
2021.8 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– **Inaudible Voice Command Injection via Charging Cables**.
2021.12 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– **Advance LoRa Demodulation Scheme**.
2021.9 An AI-enhanced Lora signal demodulation scheme that empower the communicate distance and lifetime of LoRa node.

2020.6– **Secured and Privacy Protected Voice Selection System**.
2021.8 A selective jamming system to prevent users' voice from being eavesdropped while not abusing others communication.

2020.5– **Speaker Authentication with Ultrasonic Signals**.
2021.5 Design advanced and secured speaker recognition algorithm with using ultrasonic signals.

2018.6– **Real-time human activities recognition by using 3D radar image reconstruc-**
2019.5 **tion 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.

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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 **H. Guo**, Y. Wang, N. Ivanov, L.Xiao, Q. Yan. *SpecPatch: Human-In-The-Loop Adversarial Audio Spectrogram Patch Attack on Speech Recognition. Accepted by* **CCS 2022**

Paper **H. Guo**, C. Li, L. Li, Z. Cao, Q. Yan, L.Xiao. *NEC: Speaker Selective Cancellation via Neural Enhanced Ultrasound Shadowing. Published by* **DSN 2022**

Hanqing Guo, Chenning Li, Lingkun Li, Zhichao Cao, Qiben Yan, Li Xiao

Paper **H. Guo**, Q. Yan, N. Ivanov, Y. Zhu, L.Xiao, E.J.Hunter. *SUPERVOICE: Text-Independent Speaker Verification Using Ultrasound Energy in Human Speech. Published by* **AsiaCCS 2022**

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

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. AlQarni, 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*

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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

2022.5– 2022.8	**Research Intern**. Intern at Samsung Research America for security topic.
2020.9– 2022.5	**Teaching Assistant**. CSE 410: Operating System. C++ programming and Linux/Unix system. CSE 260: Discrete Structures in Computer Science.
2020.1– 2020.9	**Research Assistant**. Research on speech recognition system, security of AI/IOT systems.
2019.9– 2020.1	**Teaching Assistant**. CSE 232: Introduction to Programming II. C++ programming
2017.1– 2019.8	**Research Assistant**. Do wireless communication, machine learning, signal processing related research.
2015.6– 2016.11	**Global Communications Engineer at Fiberhome Coporation**. My work responsibility includes: design network topology, troubleshoot network problems by Linux commands, and assign route to improve robustness of network

Languages

4+ years	**Python, Java, C++, JavaScript, Pytorch, Tensorflow**

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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