Wenhan Zhang

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My research primarily revolves around wireless communication and networks, with a recent emphasis on the application of AI/ML models in the context of wireless systems.
No sponsorship required

Education

University of Arizona *Aug. 2018 – Present*
PhD in Electrical and Computer Engineering Tucson, AZ

Syracuse University *Aug. 2016 – May 2018*
MS in Electrical Engineering Syracuse, NY

Hefei University of Technology *Aug. 2012 – May 2016*
BS in Electrical Engineering Hefei, China

Experience

Research Scientist Internship *May 2022 -— Aug. 2022*
Intel Labs Portland, OR

- Implemented wireless SISO and MIMO detection techniques for various QAMs
- Modified probabilistic ML algorithms, such as ADVI, for QAM detection

Research Assistant *June 2019 – Present*
University of Arizona Tucson, AZ

- Conducted research in PHY implementation of commercial protocols, including LTE, 5G NR, and 802.11ax
- Simulated RF signals by baseband I/Q pairs, considering coding, OFDM, and channel modeling
- Constructed AI/ML classifiers for wireless signal detection across shared spectrum bands, encompassing protocol, modulation schemes, and coding rate identification
- Developed robust and secure RF classifiers against AI/ML threats, including adversarial evasion and poisoning
- Established IP address-based measurements to assess propagation, transmission, processing, and queuing delays between a mobile device, base station, and an AWS cloud center
- Conducted research on E2E delay estimation approach in the mobile computing systems
- Designed the computational task offloading algorithms to optimize the user-experienced latency
- Simulated MAC layer contention in a Wi-Fi system, and analyzed QoS in the network layer

Teaching Assistant *Aug. 2018 – May 2019*
University of Arizona Tucson, AZ

- Facilitated lectures and conducted coding lab sessions on C programming using Visual Studio and Xcode

Teaching Assistant *Aug. 2017 – May 2018*
Syracuse University Syracuse, NY

- Assisted with hardware experiments with protoboard, electronic components, signal generators, oscilloscopes, and microcontrollers (specifically, Arduino)
- Helped implementing software simulations using NI Multisim

Skills

Languages and Tools: Matlab, Python, C/C++, Keras, Tensorflow, Pytorch, Scikit-learn, Docker, Git, SQL

Research Areas: Wireless Communication (PHY/MAC), Computer Networks (TCP/IP), Digital Signal Processing, Robustness of Machine Learning, Deep Learning

Relevant Coursework

PhD: Wireless Protocols, Network and Information Security, Advanced Computer Networks, Computer Systems and Network Evaluation, Applications of Machine Learning, Deep Neural Networks, Advanced Topics in Artificial Intelligence, Fundamentals of Optimization. **MS**: Digital Communications, Wireless Communications, Digital Signal Processing, Sensor and Measurements, Statistics Regression Analysis, Probabilistic Methods. **BS**: Data Structures, Signals and Systems, Electromagnetics, Circuits Theory, Computer Architecture, Logic Design, Transient and Steady State Analysis.

Honors and Awards

NSF Student Travel Grant to attend IEEE ICC 2022, Seoul, South Korea
University of Arizona GPSC Travel Grant to attend IEEE MILCOM 2021, San Diego, CA
IEEE ComSoc Travel Grant to attend IEEE MILCOM 2021, San Diego, CA
Graduate Tuition Scholarship at The University of Arizona, 2018-2020
University Science and Technology Award of Hefei University of Technology, 2016
University Scholarship of Hefei University of Technology, 2013

Selected Publications

1. **Wenhan Zhang**, Marwan Krunz, and Md Rabiul Hossein, "CyPA: A cyclic prefix assisted DNN for protocol classification in shared spectrum," *Proc. of the IEEE ICNC Conference*, Feb. 2024 (acceptance rate 24.1%).
2. **Wenhan Zhang**, Mingjie Feng, and Marwan Krunz, "Latency estimation and computational task offloading in vehicular mobile edge computing applications," *IEEE Transactions on Vehicular Technology*, Nov. 2023.
3. **Wenhan Zhang** and Marwan Krunz, "Machine learning based protocol classification in unlicensed 5 GHz bands," *Proc. of the IEEE ICC Conference Workshop*, Seoul, South Korea, May 2022.
4. **Wenhan Zhang**, Marwan Krunz, and Gregory Ditzler, "Intelligent jamming of deep neural network based signal classification for shared spectrum," *Proc. of the IEEE MILCOM Conference*, San Diego, Nov. 2021.
5. Mingjie Feng, Marwan Krunz, and **Wenhan Zhang**, "Joint task partitioning and user association for latency minimization in mobile edge computing networks," *IEEE Transactions on Vehicular Technology*, Aug. 2021.
6. **Wenhan Zhang**, Mingjie Feng, Marwan Krunz, and Amir Abyaneh, "Signal detection and classification in shared spectrum: A deep learning approach," *Proc. of the IEEE INFOCOM Conference*, Online, May 2021 (acceptance rate 19.9%).
7. **Wenhan Zhang**, Mingjie Feng, Marwan Krunz, and Haris Volos, "Latency prediction for delay-sensitive V2X applications in mobile cloud/edge computing systems," *Proc. of the IEEE GLOBECOM Conference*, Taipei, Taiwan, Dec. 2020.

Posters and Presentations

- **Wenhan Zhang** and Marwan Krunz, "Machine-learning based waveform classification in shared spectrum II," *NSF BWAC semiannual Meeting*, Online, June. 2021
- **Wenhan Zhang** and Marwan Krunz, "Machine-learning based waveform classification in shared spectrum I," *NSF BWAC semiannual Meeting*, Online, Nov. 2020

Professional Service

IEEE Journal on Selected Areas in Communications (JSAC) - Reviewer
IEEE Transactions on Mobile Computing (TMC) - Reviewer
IEEE Transactions on Communications (TCOM) - Reviewer
Elsevier Computer Communications - Reviewer

Referees (Dissertation Committee)

Dr. Marwan Krunz, Regents Professor, IEEE Fellow, Department of ECE, email: krunz@arizona.edu
Dr. Ming Li, Associate Professor, IEEE Fellow, Department of ECE, email: lim@arizona.edu
Dr. Loukas Lazos, Professor, Department of ECE, email: llazos@arizona.edu