

Moh Kashani

phone: (515) 766-0153

Email: mkashani.phd@gmail.com

Github: github.com/mkashani-phd

Professional Summary

Ph.D. in Computer Engineering with a strong background in wireless communication, RF signal processing, and secure network system design. Over 5 years of research and development experience in building custom communication protocols, AI-driven RF fingerprinting models, and real-world testbeds using Software Defined Radios (USRP B210/X310). Currently advancing quantum networking and control system design as a Research Assistant in the Quantum Computing group at the University of Wisconsin–Madison. Skilled in FPGA and embedded programming using Migen, ARTIQ, and C/C++, as well as in developing data-driven monitoring systems with PostgreSQL and Grafana. Passionate about bridging classical and quantum communication architectures to enable scalable, secure, and high-performance networks.

Education:

M.S. in Physics - Quantum Computing, University of Wisconsin-Madison, Expected Aug 2026

Ph.D. in Computer Engineering, Iowa State University, Ames, IA – Oct 2025

M.S. in Computer Engineering, Iowa State University, Ames, IA – May 2024

B.S. in Electrical Engineering, Amirkabir University of Technology, Tehran, Iran – May 2019

Professional Experience:

Quantum Network Research Assistant

University of Wisconsin–Madison, Department of Physics | Madison, WI | 2025 – Present

- Designing and implementing **real-time control systems** for quantum computer and network experiments.
- Programming **ARTIQ (Advanced Real-Time Infrastructure for Quantum physics)** boards for precise timing and deterministic control of qubits and photonic signals.
- Developing **custom FPGA circuits** and gateway extensions using **Migen** and **MiSoC**, tailored for distributed quantum networking applications.
- Integrating **PostgreSQL databases** and **Grafana dashboards** to visualize and analyze quantum experiment telemetry and IoT sensor data.
- Collaborating with experimental physicists to design synchronization protocols across quantum nodes.
- Contributing to the lab's **quantum network testbed** development, focusing on timing precision, scalability, and fault-tolerant communication layers.

Wireless Security Graduate Research Assistant,

Iowa State University, Department of Electrical and Computer Engineering | Ames, IA | 2019 - 2025

- Designed, collected, and analyzed large-scale **RF datasets** in an anechoic chamber using **USRP X310** for use in machine learning-driven **RF fingerprinting**.
- Developed and implemented **SuperImposing code on 2-FSK** wireless communication on USRP SDR platforms
- Created and trained multiple deep learning models (**complex-valued CNN** and real-valued CNN) for robust **RF Fingerprinting** and anomaly detection.
- Implemented custom MAC and IP layers in embedded systems (ESP32, Raspberry Pi Pico) using C/C++, integrating efficient and **secure wireless communication** protocols.
- Researched and developed **integrity check protocols** enhancing security for healthcare sensors using IEEE 802.15.6 and BLE standards.

Software & Automation Engineer Intern,
Corteva Agriscience | Johnston, IA | Jan 2023 – Dec 2023

- **RFID based tracking system:** Developed PCB boards for RFID tracking system and chose matching antenna. Tested the wireless reading and optimized antenna placements.
- **System Optimization & Security:** Implemented micro-python scripts and optimized embedded software to ensure reliable, low-latency data handling.
- **Cross-Functional Collaboration:** Worked closely in an agile setting, iterating rapidly to incorporate feedback from hardware, software, and data science teams.

Selected Publications:

- **Kashani, S., Sherazi, S., Khokhar, A., Kim, S. W., Nait-Abdesselam, F.** "Radio Frequency Fingerprinting in WBANs Using Complex-Valued CNNs." *IWCMC IoT & Wireless Sensors Symposium, 2024.*
- **Kashani, S., Sherazi, S., Khokhar, A., et al.** "Bluetooth Low Energy (BLE) RF Dataset for Machine Learning in WBANs." *IEEE WCNC 2024.*
- **Kashani, S., Kim, S. W., Khokhar, A.** "Two-Dimensional Compound Message Authentication Code in Lossy Channels." *IEEE International Conference on Communications (ICC) 2025.*

Core Competencies & Technical Skills:

- **Signal Processing:**
FFT-based analysis, superposition coding, signal estimation, channel modeling, and synchronization for wireless and quantum communication systems.
- **Machine Learning for RF:**
Complex-valued CNNs, RF fingerprinting, real-time anomaly detection, waveform classification, and adversarial signal defense.
- **Wireless Systems & SDR:**
Design and analysis of wireless protocols; channel propagation modeling; implementation on Software Defined Radios (USRP B210/X310); large-scale RF dataset collection, processing, and validation.
- **Networking & Security:**
Custom MAC/IP layers, integrity verification schemes, BLE, IEEE 802.15.6, and 5G protocols; secure and efficient communication design for multipath and quantum networks.
- **Quantum Control & Embedded Systems:**
FPGA-based system design using Migen and MiSoC; real-time quantum control programming with ARTIQ; distributed timing and feedback for quantum network synchronization.
- **Programming & Tools:**
C/C++, Python, MATLAB, GNU Radio, TensorFlow, PyTorch, Scikit-learn, PostgreSQL, MongoDB, Grafana, Git, CMake, and Agile development practices.

Honors and Awards:

- Accepted to NSF NeTS Early Career Workshop: Presented AI-based anomaly detection for secure wireless communication.
- Best Graduate Seminar Presentation Award.
- Second-Best Senior Design Project: Multi-agent autonomous vehicle platooning.