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# Mohammad Ali

[xash.space/blog](https://xash.space/blog)

## EDUCATION

**University of North Dakota, Grand Forks, ND**

**Present**

PhD in Electrical Engineering, Advised by Jielun Zhang

## EXPERIENCE

**IC3 Researcher**

**08/2023 - Present**

Laboratory of Innovations in Cybersecurity, Computer networks, and Communication. Primary focus on AI/ML in Intrusion Detection Systems, Radio Frequency and Large-Language-Models. Managed undergraduate student projects during summers.

**ACNS Researcher**

**02/2023 - 05/2023**

Advanced Communications and Network Security laboratory focusing on Bluetooth security. Started project from scratch, replicating recent Bluetooth attacks and developing defensive countermeasures.

**National Cyber League Student Advisor**

**11/2021 - 12/2021**

Lead team of students for a National Capture the Flag Competition. Managed teaching security concepts, Linux tools, group meetings and final selection of candidates for national competition.

## PROJECTS

**3D Waste Plastic Recycling | University of Dayton**

**08/2022 - 12/2022**

Developed methodology to clean and sanitize plastic utensils taken from dining rooms. Group tested different designs by using already developed technology: washing machines and ultrasonic cleaners. I worked on integration of relay sensors, water pumps, and Arduino to automate infrastructure.

**LoRa Data Acquisition & Analysis | University of Dayton**

**01/2022 - 05/2022**

Initial setup of Internet of Things devices (sensors) on an urban agricultural setting for non-profit, Mission of Mary Cooperative. I spearheaded the research for specific communication protocols, and decided upon LoRa for data acquisition. Group built, setup and tested the infrastructure on site.

**Arduino ESP32 Wardriver**

**11/2021 - 12/2021**

Put together an Arduino based wardriver written in C++ via an ESP32 development board, NEO-6M GPS and SSD1306 display. All captured data logged and transferred to Raspberry Pi via Python & Shell scripts.

## SKILLS

- **Cybersecurity:** IDA-Pro, BloodHound, Wireshark, IDS, Active Directory, Cobalt Strike
- **Software Defined Radio:** USRP B210, B200 Mini with GNU Radio and MATLAB
- **Networking:** TCP/IP, Bluetooth with CYW920819
- **Embedded Systems:** Arduino, ESP32, Raspberry Pi
- **Programming:** Python, C, C++, POSIX Shell

## LEADERSHIP AND EXTRACURRICULARS

- CARS ChatGPT Poster 1st Place \$1000 Prize
- CompTIA Security+ Certificate (SEC+)
- Offensive Security Certified Professional (OSCP)
- Certified Red Team Professional (CRTO)
- National Cyber League Individual (CTF):
  - National Cyber League FA 2021: 193/6480
  - National Cyber League SP 2022: 77/6022

## PUBLICATIONS

- **M. Ali**, J. Zhang and F. Ye, "Mitigating Cross-Transport Key Derivation Attacks in Bluetooth Communication" *IEEE NAECON 2023*
- **M. Ali**, and J. Zhang "Explainable Artificial Intelligence Enabled Intrusion Detection in the Internet of Things" *IEEE ISICN 2024*
- F. Li, **M. Ali**, and J. Zhang "Cyber Attack Detection in IoT Using Enhanced Stream Classification Algorithm" *IEEE ISICN 2024*
- **M. Ali**, and J. Zhang "Automatic Modulation Recognition Across SNR Variability Via Domain Adversary" *IEEE VTC Fall 2024*
- **M. Ali**, and J. Zhang "Exploring the Effectiveness of Synthetic Data in Network Intrusion Detection through XAI" *IEEE CARS 2024*
- **M. Ali**, I. Udodiok, F. Li, and J. Zhang "A Review on Generative Intelligence in Deep Learning based Network Intrusion Detection" *IEEE CARS 2024*
- **M. Ali**, F. Li, and J. Zhang "Signal Classification Using Unsupervised Domain Adaptation" *To be published.*