John Dale

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Education

University of Massachusetts, Amherst **Amherst, MA**
Bachelor of Science in Computer Engineering | **GPA**: 3.72/4.00 **Sept. 2020 – Dec. 2024**

Skills

Technologies: Linux, Git, KiCad, ROS2, AWS, Flask, OpenCV, 5G Architecture, RFID
Languages: Python, C++, C, SQL, Bash, MATLAB, HTML, CSS
Technical: SMD Soldering, PCB Assembly, Oscilloscope, Multimeter, Spectrum Analyzer, Spot welding

Experience

MITRE **McLean, VA**
Computer Engineering Intern **June 2023 – Aug. 2023**

- Developed and scaled a Python application for testing the performance of private 5G network configurations in high device density scenarios, allowing RAN and core optimizations for beamforming and MU-MIMO features.
- Utilized network interface isolation to consolidate devices and reduce required test resources by a factor of 5.
- Led the configuration and deployment of a 5G femtocell integrating an open source 5G core solution.

iRobot **Bedford, MA**
Systems Test Engineer Co/Op **Jan. 2023 – May 2023**

- Spearheaded the development of a Python testing application for extracting robot vacuum performance metrics from positional data localized by Qualisys, an infrared motion capture system; Reduced testing time by 70% for wall follow and object avoidance algorithms.
- Programmed with C++ to increase the clock resolution of an embedded Linux platform used for collecting sensor data by 5x, directly improving the precision of a ground truth system for autonomous testing.
- Designed and implemented a ROS2 package in Python for the iRobot Create 3 STEM platform.

National Science Foundation **Amherst, MA**
REU Drone Systems Research **May 2022 – Aug. 2022**

- Developed embedded and server-side software in C++ and Python respectively for a custom drone package delivery prototype; Package recipients received SMS text messages with an image verifying the delivery.

Individual Projects

Authenticity of Digitally Signed Images, *Ongoing Senior Design Project* **July 2023 – Present**

- Digital camera prototype for protecting the integrity of photos and their metadata, including time and location.
- Utilizes STM32 microcontroller, AES encryption, digital signing, and AWS in an end-to-end system.

Hacking Radio-Frequency Identification Protocol, *HackUMass 1st Place Award* **Nov. 2022**

- Reverse-engineered RFID protocols using bit-banging to simulate malicous attacks on access control systems.
- Programmed an injectable, sniffing device capable of remote replay and DOS attacks using C++ and ESP8266s.
- Integrated a GUI to visualize live data coming across the interface and explain how the attacks work to professors.

Electric Vehicle Design & Fabrication, *3-Seat Electric Couch* **June 2022 – Aug 2022**

- Researched, designed, and built electrical sub-systems for a wireless PS4 controlled multi-passenger vehicle.
- Programmed electric steering and braking, dynamic throttle control, reverse, lights, and horn functionality in C++.
- Integrated digital potentiometers, LL duplex shifters, MOSFET's, DC-DC buck converters, and 18650 cells.

Extracurricular Activities and Awards

IEEE-HKN National Honor Society, *President* **Feb. 2022 – Present**

- Lead a team of over 20 members in activities aimed at strengthening the ECE department and providing support to current undergraduate students. This includes the development of class guides, promotion of research, and offering teaching assistance.

Department of Homeland Security Suitability **June 2023**
Grand Prize Hack – *HackUMass 36-Hour Hackathon*, *500 participants* **Nov. 2022**
UMass Amherst Dean's List **Sept. 2019 – Sept. 2023**