

# Omar Mohammed

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## EDUCATION

### Syracuse University

*Bachelor of Science in Electrical Engineering, Minor in Business*

May 2027

Syracuse, NY

- **GPA: 3.90**, Honors Student, 1870 Scholar (Full Tuition Merit Award), 4x Dean's List
- Coursework: Digital Logic Lab, Microcontroller Lab, Signals & Systems, Analog Electronics, Power Engineering

## EXPERIENCE

### Hardware Systems Researcher - Climate Hazards Research Team (CHaRTS) May 2025 – Present

*Syracuse University*

Syracuse, NY

- Designed hardware for UFONet, an IoT flood monitoring system, collaborating with PhD researchers to deploy battery-powered sensor nodes
- Engineered 2-layer PCB integrating Raspberry Pi compute module, LoRaWAN wireless communication, thermal/optical cameras, GPS, and environmental sensors for outdoor deployment
- Built data pipeline using Python and FastAPI to process sensor telemetry and enable remote device control for wireless monitoring and configuration
- Coordinated PCB fabrication with vendors, maintained design documentation in GitHub, and supported field deployment for validation testing

### Teaching Assistant - EdQuantum Project

July 2025 - Oct. 2025

*NSF-Funded Quantum Education Initiative, Syracuse University*

Syracuse, NY

- Presented quantum education research at NSF Advanced Technological Education Conference in Washington, D.C. to 850+ STEM educators nationwide
- Developed and taught hands-on lab sessions to 9 high school students in Quantum Frontiers program using optical setups to demonstrate quantum principles

## PROJECTS

### Elevator Control System | C, ATSAMD21, MPLAB X, Register-Level Programming

Oct. 2025

- Programmed 10-floor elevator controller on ATSAMD21 handling user floor requests via keypad, with LCD displaying real-time floor position and status
- Implemented interrupt-driven system using timer at register level to achieve 2-second floor transitions
- Integrated LCD, keypad, LEDs, and buzzer through direct GPIO and timer control without Arduino libraries

### 4-Bit CPU Architecture | VHDL, Intel Quartus, Analog Discovery 2

May 2025

- Designed CPU on Analog Discovery 2 FPGA with custom instruction set supporting arithmetic, logic, and conditional operations
- Developed datapath and control unit in VHDL including ALU, registers, program counter, and state machine
- Validated design through simulation and hardware testing, running arithmetic and logic test programs

### Arduino Bluetooth Messaging System | C, Arduino, Bluetooth

Sept. 2025

- Built wireless messaging device using Arduino and HC-05 Bluetooth module for two-way texting with smartphone
- Implemented multi-tap keypad text entry based on key-press duration with 16x2 LCD display

## TECHNICAL SKILLS

**Embedded Systems:** ATSAMD21, STM32, ESP32, Arduino, Raspberry Pi, Register-Level Programming

**Hardware Design:** PCB Design (KiCad), FPGA (Intel Quartus), VHDL, RTL Design, FSM Design

**Lab Equipment:** Oscilloscope, Multimeter, RLC Meter, Waveforms, Soldering Station

**Tools & Languages:** C/C++, MPLAB X, STM32CubeIDE, Python, Java, Git, Docker, Claude Code