

# Alex Mitelman

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## EDUCATION

### The Ohio State University

B.S. in Computer Science Engineering, Information and Computation Assurance Specialization

Columbus, OH

December 2025

ICA is an NSA Validated Cyber Defense Program of Study

Cumulative GPA: 3.6/4.0; Dean's List 2022-2025

## EXPERIENCE

### QXSOFT - Computer Science Intern

March 2025 – October 2025

- Fully prototyped 3 iterations of a full-stack IoT humiture and collision detection system achieving greater than 120-day battery life through deep sleep and hardware interrupt optimization by managing the entire lifecycle and hardware selection.
- Engineered a C# companion application for real-time sensor visualization, device configuration, TCP-based data streaming to an existing CMM Monitor application, and designed a custom JSON protocol over BLE/TCP while debugging and resolving critical connection instability issues.
- Implemented custom JSON exports for 16+ different feature types including Cloud-to-Surface and Tolerance reports by refactoring core C++ systems to enable automated deviation calculations for client-side data analysis.
- Simulated over 1,200 hours of continuous CMM operation using PLC hardware and PowerShell scripts to display real-world usage within the CMM Monitor application which became standard in the company's product demo.
- Authored a C++ Smart Cylinder algorithm that calculates measurement boundaries to prevent the feature from hitting the stylus shank by factoring in cylinder height, stylus length, and ruby radius to eliminate 100% of out-of-range errors.
- Reworked cross-application communication layers using named pipes to sequentially query report status, ensuring data integrity and resolving race conditions in high-frequency data environments.

### JSET Automated Technologies - Controls Technician Apprentice

Jul 2022 – Sep 2022

- Executed large-scale temperature control installations for AWS and Google data centers focusing on commercial HVAC and cooling efficiency.
- Installed surveillance devices and Wi-Fi networks at an industrial scale and learned technical engineering practices.

## PROJECTS

### Malware Reverse Engineering & Capability Analysis | Ghidra, x86 Assembly

Jan 2026

- Performed a complete static analysis of a Windows backdoor using Ghidra to reconstruct the internal logic and determine how the malware establishes a connection to a remote server.
- Deconstructed a command dispatch table to identify 11 shell commands an attacker can send to the infected system to perform actions like uploading and downloading files or sleeping to avoid detection by tracing data flow in the program's data segment.
- Discovered the primary method of system control by tracing how the malware executes the Windows Command Prompt to provide an attacker with a remote terminal.

### Repo Rover | Next.js, Flask, LangChain, Elasticsearch, OpenAI

Dec 2025

- Built an AI assistant RAG pipeline to provide code explanations and security insights without local cloning for public Github repos.
- Implemented hybrid semantic and keyword search with vector embeddings to generate contextual, cited answers from GitHub APIs.
- Architected data flow from ingestion to language detection, providing users with specific file and line references.

### React Smart Lock | React, Node.js, WebSockets, C++, Arduino

May 2025

- Developed the front-end interface in React, which communicated lock/unlock commands to a Node.js server using WebSockets for live, low-latency interaction.
- Programmed an Arduino microcontroller in C++ to receive commands to actuate the solenoid locking mechanism.

## ACTIVITIES

### HUMANITARIAN ENGINEERING SCHOLARS

Aug 2022 – Dec 2025

- Received training in collaborative design, equity-mindedness, professionalism, and perspective-taking.
- Gained experience co-defining problems, co-developing solutions, and co-implementing projects for communities to ensure welfare.

## ADDITIONAL

Languages: C++, C#, C, Python, Java, x86 Assembly, SQL, HTML, and JavaScript

Security Tools: Ghidra, Wireshark, and WinDbg

Technical Software: Git, GitHub, Visual Studio, VS Code, MATLAB, and SolidWorks