Ayden Coughlin

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EDUCATION

The Ohio State University, College of Engineering (3.988 GPA) — **Columbus, OH**

Master of Science in Computer Science and Engineering — *January 2026 – May 2027*

Bachelor of Science in Computer Science and Engineering — *August 2022 – May 2026*

- Minor in Mathematics
- Dean's List (7/7 semesters)

PROFESSIONAL EXPERIENCE

Air Force Institute of Technology — **Dayton, OH**

Research Intern — *May 2023 – December 2023*

- Used Python and Keras to train and evaluate convolutional neural networks that generate hyperspectral data, improving the accuracy of CTISR's sensor emulation tool ASSET.
- Co-authored a paper describing the methodology and results of the research and won a Best Student Paper Award.
- Presented the results of our research at the international SPIE Sensors + Imaging conference.
- Created an efficient and intuitive graphical user interface using Python to help non-technical users interact with the model and generate images.
- Validated the efficacy of combinatorial testing for ASSET.

RESEARCH EXPERIENCE

The Ohio State University — **Columbus, OH**

Research Assistant — *August 2025 – Present*

- Co-author of &INATOR, the first approach for inferring safe, precise, correct Rust interfaces from C programs, a key enabling component of C-to-Rust translation.
- Leading a follow-on project using &INATOR's interfaces to output safe and correct implementations of programs.

PROJECTS

Infinite Chess

- Designed a novel, efficient rendering algorithm to display an infinitely-sized chess board on a webpage in Javascript.
- Implemented a variety of quality of life features based on the feedback of a community of 30+ Infinite Chess players.

UHC Plugin

- Worked with a small team of developers to develop a plugin in Kotlin for a Minecraft server with 50+ players.
- Implemented dozens of variants on the base game informed by quantitative user feedback polls.
- Lead the development of a companion website that interfaced with the server, written in React and Express.js.

Mint

- Designed the syntax and semantics for a simple, statically-typed language, supporting a variety of modern features.
- Implemented a transpiler from the language to JavaScript.
- Created a web IDE to write and execute programs in the language.

Iris

- Designed and implemented a content management system for educational articles using Svelte Kit.
- Used WebGL to create interactive visualizations for physics and computer science articles.

Velvet

- Created a web app to organize music on a pannable, zoomable two-dimensional canvas using Svelte and SVGs.
- Used various REST APIs to fetch YouTube playlist data, find music by keywords, and to play music through YouTube.

QUALIFICATIONS

- **Programming Languages:** Rust, Java, Kotlin, C, Javascript, Typescript, HTML, CSS, C#
- **Frameworks & Libraries:** Svelte, React, Express, Mono, WebGL, Keras
- **Tools & Platforms**: Git, Linux, Z3
- **Graduate Coursework:** Algorithms, Programming Languages, Advanced Symbolic Logic, Rust for Security Seminar

LEADERSHIP & ACTIVITIES

Competitive Programming Club — *May 2023 – April 2026*

President ('25-'26), Event Coordinator ('24-'25), Engineer ('23-24)

- Designed and presented weekly lectures on various data structures and algorithms for 50+ members.
- Designed, tested, and implemented competitive programming problems for three major club events, totaling 150+ participants.