Matthew Dowling

dmatthw@umich.edu | 3110 Fairhaven Ct. Ann Arbor, MI 48105 | 734-223-2062 | US. Citizen | linkedin.com/in/matthwd

EDUCATION

University of Michigan   Ann Arbor, MI
Bachelors of Science in Engineering, Computer Science. Minor in Math.   May 2026
GPA: 3.99/4.0

Relevant Coursework:

Computer Science:	Operating Systems (& accelerated os projects), Web Systems, Computer Security, Computer Organization, Data Structures and Algorithms
Math:	Advanced Cryptography (graduate level), Honors Algebra, Honors Introduction to Analysis, Abstract Linear Algebra, Combinatorics, Honors Differential Equations, Mathematical Foundations of Compsci

OBJECTIVE

- Obtain a computer security, software engineering, or machine learning internship summer 2025

SKILLS

Programming Languages

- Python, C++, C, Matlab, Javascript, React, Bash, Java, SQL, Assembly (ARM, x64), R

Other skills

- HTML, CSS, LaTeX, Microsoft Office, Linux, WSL, Windows, VScode, Mercurial, Git, Docker, Microsoft Teams, Wireshark, virtual machines, GDB, Ghidra, multi-threading. Kali Linux hacking tools

EXPERIENCE

University of Michigan Department of Naval Architecture and Marine Engineering   Ann Arbor, MI
Advanced Naval Concepts Laboratory Student Researcher   May 2023 – Present

- Currently leading the lab in a project to investigate new approaches on the anomaly detection problem for cyber-physical systems. Such research may aid the monitoring of cyber attacks on ships.

- Expanded an existing early stage ship design algorithm's capabilities to allow ship components to be configured in a 3-dimensional representation vs. the existing 2-dimensional capability. We wrote a paper and presented it at the International Marine Design Conference June 2024. I am the first author of the paper. (Dowling, M. et. al. (2024). Characterizing Three-Dimensional General Arrangements and Distributed Systems Using an Architecturally Normalized Current Representation. Proceedings of the 15th International Marine Design Conference, Amsterdam, Netherlands.)

- Developed a graphical user interface (GUI) using Python as part of a PhD student's statistical physics project that enabled larger simulations to be constructed and executed; the GUI has helped the research become more representative of the real life, complex systems being studied.

Michigan Tech Research Institute   Ann Arbor, MI
Third Internship   (software engineering, machine learning)   May 2024 - Sep 2024

- Developed on my own the backbone of a generative machine learning scheme via modeling arbitrary dimensional data with Gaussian Copula Mixture Models. Implemented with a quasi-newton gradient search on the maximum likelihood objective, initial seeding, and with new model selection methods to decide the amount of mixture components. We don't know of anyone else who has done this. Written in Matlab.
- Presented an in-depth summary of summer's work to improve employees' understanding of the project

Second Internship (software engineering, machine learning)   May 2023 - Sep 2023

- Implemented new algorithms using Matlab to create simulations that assess the impact of multivariate change detection methodologies on detecting radio frequency interference in radar images. Some new methods to test for homogeneity significantly outperformed the popular Generalized Likelihood Ratio Test.
- Presented an in-depth summary of summer's work to improve employees' understanding of the project

First Internship (performance analyzer)   June 2022 – August 2022

- Quickly learned Matlab and R to test performance on algorithms that learn the causal structure of datasets. Developed scripts to visualize data in an informed way such that proper analysis could be done. Such algorithms were used later on for feature selection schemes on various other projects.

AWARDS

- 3rd place 2024 WolvCTF (Umich Division), awarded 350 dollars in prizes, and for best solution writeup
- Max E. Tobias Scholarship for University of Michigan (2022, academic and athletic scholarship, 4 years)
- Academic Recognition (University Honors & Dean's List) – Fall 2022 through Winter 2024
- Tau Beta Pi Engineering Honor Society Member (45 hours of activities and service during Fall 2023)
- 63rd Science and Engineering Fair of Metro Detroit 3rd Place Physics and Astronomy Division - 2020