# Alan Zhang

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## EDUCATION

**UNIVERSITY OF MICHIGAN, College of Engineering** ***(GPA: 3.93/4.00)*** Ann Arbor, MI
- Master of Science in Engineering (Computer Science) May 2026
- Bachelor of Science in Engineering (Computer Science), Minor in Statistics May 2025
- Coursework: Data Structures and Algorithms, Discrete Mathematics, Machine Learning, Computer Architecture, Compilers, Cybersecurity, Operating Systems, Computational Linear Algebra, Computational Statistics, Distributed Systems

**THOMAS JEFFERSON HIGH SCHOOL FOR SCIENCE AND TECHNOLOGY** Alexandria, VA
- AP Scholar with Distinction, National Merit Scholarship Commended Scholar Class of 2021

## SKILLS

**Languages/Technologies:** Python, Java, C/C++, OCaml, Julia, SQL, R, Docker, NumPy, SciPy, PyTorch, Pandas
**Tools:** Linux, Git, Jupyter, Google Cloud Platform, VS Code, Visual Studio, IntelliJ, Ubuntu, Unreal Engine
**Extracurricular:** Cello (Principal of Campus Symphony Orchestra), Ballroom Dance (Open Collegiate National Champion)

## INDUSTRY EXPERIENCE

**UNIVERSITY OF MICHIGAN** Ann Arbor, MI
*Computer Security (EECS 388) Instructional Assistant* August 2024 - Present
- Maintained infrastructure for five large cybersecurity projects including Docker images, virtual machines, and web services
- Conducted weekly lab sessions for 50 students focused on reinforcing and expanding on cybersecurity concepts and held frequent 1-on-1 office hours sessions to provide help with projects or shore up gaps in conceptual understanding

**CHARLES SCHWAB** Ann Arbor, MI
*Software Engineering Intern* June 2024 - Aug 2024
- Optimized a critical cybersecurity tool for the award-winning thinkorswim® trading platform with a speedup of 300% utilizing a LRU cache and improved Regex pattern matching, decreasing latency for thousands of users
- Created a fully automated pipeline to list open-source package usage from Blackduck for production releases in TeamCity
- Leveraged IntelliJ and Java to bugfix tooling integration with Windows and Linux enabling multi-platform development

**WÄRTSILÄ** Herndon, VA
*Software Engineering Intern* May 2023 - Sep 2023
- Spearheaded outage detection development on gigabytes of live energy storage data using parallel processing on Spark and cloud computing (GCP)
- Performed and presented statistical analysis using Pandas on effect of auxiliary power consumption on battery cycling
- Software design and scrum app development using CI/CD and data pipeline using PostgreSQL

**GEORGE MASON UNIVERSITY** Fairfax, VA
*Research Assistant* Sep 2020 - Jan 2021
- Research using neural networks and deep learning to predict protein folding patterns based on the Alphafold methodology

## PROJECTS

**OAT COMPILER** | *OCaml, LLVM IR, x86-64*
- Built end-to-end compiler with dataflow analysis and optimizations from a C-like language to LLVM IR to x86-64
- Implemented assembler and simulator for x86-64 programs

**THREAD LIBRARY** | *C++*
- Developed a thread library with context switching for multi-CPU machines which optimizes thread lifetimes and scheduling algorithms that supports mutexes, conditional variables, timer and inter-process interrupts, joins, and yields

**NETWORK FILE SERVER** | *C++*
- Completely constructed a remote hierarchal file server consisting of directories and inodes
- Implemented fine grained locking to execute multithreaded concurrent read/write requests while maintaining crash consistency via carefully ordered disk I/O

**STRETCHVR** | *C++, Python*
- Led development in Unreal Engine 5 for a complete virtual reality application teaching yoga and meditation routines

## HONORS & AWARDS

Donald A. Richards Scholarship, 2023
William J, Branstrom Freshman Prize, 2021
Dean's List, Fall 2021, Fall & Winter 2022, Fall & Winter 2023, Winter 2024
University Honors, Fall 2021, Fall & Winter 2022, Fall & Winter 2023, Winter 2024