

# Alex Gulko

alex@gulko.net • 440-318-9046 • gulko.net

## EDUCATION

### The Ohio State University

Bachelor of Science — Computer Science and Engineering in Artificial Intelligence

Expected graduation: 2026

**GPA: 3.81**

## EXPERIENCE

### The Ohio State University — Research Assistant in Machine Learning and Visualization Sep 2022 - Present

- Invented a novel data compressor with **16x** compression under **0.0097% error**, improving by **68%** over baseline
- Developed a parallel mass experimentation framework with Python, PyTorch, WandB, MPI, and CUDA
- Compressed 4-dimensional scientific data with 250 million datapoints using interpretable Deep Learning methods

### American Electric Power — Technology Intern, Automated Testing and DevOps May 2023 - Aug 2023

- Tasked to eliminate technical debt, developed an automated code quality analysis system, expediting code reviews from **days to 300 milliseconds** and reducing workload of Software Engineers by **50%**
- Created a web dashboard for real-time code analysis using Svelte, TypeScript, WebSockets, and Node.js
- Built a GitHub Actions pipeline to assess code on commits and pull requests and generate PDF reports with Puppeteer

### Hyland Software — Software Engineer Shadow May 2022 - Jul 2022

- Developed a backend system for an online store using C#, .NET, and SQLite, achieving secure data management and seamless integration into a CircleCI CI/CD pipeline
- Collaborated with a senior engineer to run static analysis and leverage Test-Driven Development, enhancing reliability
- Mastered modern software design patterns and industry practices in .NET to improve quality for scalable solutions

### Sigma — Founder, CEO Dec 2019 - Sep 2020

- Designed a machine learning algorithm to optimize decentralized smart home systems, improving cost-efficiency
- Presented research and technical findings at the California Science and Technology Fair and discussed market fit with the Sputnik ATX startup accelerator CEO
- Directed a team of five to develop and test a fully functional minimum viable product, integrating ML algorithms for real-time decision-making

## ENGINEERING PROJECTS

### Uncountable — Team Lead — Winner, HackOHI/O (1st out of 200+ teams) Oct 2023

- Designed and fine-tuned a YOLOv8-based computer vision model to track surgical tools in real-time and prevent Retained Surgical Instruments, **affecting 1500 people** every year
- Integrated machine learning pipelines into an Electron.js app, providing a user-friendly tracking interface
- Engineered a multi-threaded system architecture leveraging Python subprocesses and Flask WebSocket APIs to enable efficient real-time data processing

### Grape I/O — ML Engineer — 1st Place at HackAI Feb 2023

- Designed and implemented a machine learning model to predict wine quality based on chemical composition
- Built and preprocessed a custom dataset of 200 wines by web scraping and feature engineering
- Developed an interactive dashboard with Vue.js showcasing model predictions and parameter exploration, enabling users to experiment with wine quality insights

### Collision — Team Lead — 4th place out of 220 teams Oct 2022

- Designed and implemented a scheduling tool to analyze availability in groups and find optimal meeting time
- Integrated Google OAuth 2.0 Calendar API to access availability into a full-stack app with Vue.js and Node.js
- Adapted dynamically, redistributed responsibilities and guided the team after an unexpected team member dropout

## LEADERSHIP AND VOLUNTEERING

### Software Engineering Club — Founder, President Sep 2023 - Present

- Started and led a student organization with over 400 members to promote relevant tech skills to OSU students
- Taught workshops in full-stack web development, cloud computing, and Python, helping students enrich their skillset
- Supervised development of a peer mentorship service with Student Government to support undergraduate research

## SKILLS

**Programming languages:** C++, C, Python, x86 assembly, JavaScript, TypeScript, C#, Java, MATLAB

**Scientific computing:** PyTorch, TensorFlow, CUDA, Jupyter, Pillow, OpenCV, NumPy

**Embedded:** VHDL, Linux, FPGA

**Web development (full-stack) and Cloud:** Node.js, Vue.js, Svelte, Django, AWS, Google Cloud Platform, Git

**Other:** .NET, Android SDK, Agile, Jira, SolidWorks

**Coursework:** Data Structures, Algorithmic Analysis, Multivariable Calculus, Linear Algebra, Digital Logic, Computer Vision, Machine Learning