

Joshua Zhang

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EDUCATION

University of Washington

GPA: 3.98, Intended B.S. Computer Science

Seattle, WA

June 2026

EXPERIENCE

Art of Problem Solving

June 2024 - Current

Software Engineering Intern

San Diego, CA

- Migrating the AOPS Academy Website from an old PHP framework to a new **NextJs** and **Fastify** design.
- Implements an online placement exam with **React & Typescript** used by 12 campuses and 20,000+ students.
- Wrote unit tests using **Jest**, and **Storybook** and end to end tests in **Playwright** to ensure codebase scalability.

Advanced Robotics at UW

Sept 2023 - Current

Controls Software Engineer

Seattle, WA

- Refactored Sentry robot code in **C++**, implementing substantial enhancements for improved functionality.
- Maintains Taproot, an open-source framework for Robomaster robots, used by most teams within the US.
- Won **1st place** out of 20 teams in all RoboMaster competition formats inside North America 2024.

Department of Homeland Security

June 2023 - Aug. 2023

Software Engineering Intern

Washington D.C.

- Performed an in-depth research study evaluating the precision of Vicuna-GPTQ in document processing, leveraging 74 distinct prompts for comprehensive assessment.
- Improved the accuracy of Large Language Model(LLM) document processing by 30%+ integrating a **ChromaDB** Vector Database, demonstrating the applicability of LLMs for document processing and information retrieval.
- Created the baseline framework in **Python** for future information retrieval research within the OCIO DHS.

Fweefwop Cybersecurity

May 2021 – June 2022

Web Developer

Cupertino, CA

- Ran a Capture the Flag competition with **600+** participants from **28** countries, and **40,000+** submissions.
- Developed 15 web problems with unique exploits using **PHP, Python, Javascript, SQLITE**, and more.
- Set up **Docker Containers**, giving each individual problem its own secure environment.

Identifying NEOs in NASA WISE data using Tensorflow

June 2021 – March 2022

ML Researcher

Cupertino, CA

- Used **Tensorflow** to identify 40+ Near Earth Objects (NEOs) within NASA's WISE database via an image subtraction technique that identified movement within different photos.
- Identified synthetic NEOs with 96% accuracy and real NEOs with 91% accuracy.

PROJECTS

Spotify Recommender | *Python, Flask, Scikit-learn, NextJS, React, Typescript, Tailwind*

- Applied One Hot Encoding, MinMax, and Z-score to normalize columns of data.
- Used Cosine, Euclidean, and Manhattan distance formulas to generate vector embeddings for 12,000 songs.
- Built a frontend using **React**, giving users a graphical visualization of songs and their recommendations.

WildEye AI | *Flask, Tensorflow, NextJS, React, Typescript, Tailwind*

- Trained a model based on **Tensorflow** Inception_V3 capable of identifying 90 different animal species from photographs with an 86% test accuracy.

Auto Reddit Video | *Python, MoviePY*

- Fully automatically generate text-to-speech Youtube shorts from Reddit posts, gaining 50k+ views across all platforms.

TECHNICAL SKILLS

Languages: Typescript, Javascript, Python, Java, C++, SQL, HTML/CSS, Bash

Frameworks: React, Next, Vue, Nuxt, Tailwind, Tensorflow, PyTorch

Developer Tools: Git, VSCode, Visual Studio, Microsoft Azure, Firebase, Eclipse, Burp Suite

Libraries: Pandas, NumPy, Matplotlib, Scikit-Learn, SciPy, Seaborn, Strapi, Storybook

Awards: USAPhO Top 400 (2021, 2022), National Cyber Scholar (2022, 2023)