Joshua Zhang

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EDUCATION

University of Washington   Seattle, WA
GPA: 3.98, B.S. in Computer Science   *June 2026*

EXPERIENCE

Art of Problem Solving   June 2024 - Current
Software Engineering Intern   *San Diego, CA*
- Implemented an online placement exam using **React** and **Tailwind**, significantly increasing accessibility to AOPS Academy courses for over 20,000 students across 12 physical campuses.
- Synchronized data on the new Academy site to the old **PHP** site using a **REST API** written in **Fastify**.
- Improved loading speed of placement exam site by **34%** by pruning unnecessary API calls and **caching** data.

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) information fetching from documents by **30%+** by connecting a **ChromaDB** Vector Database to the LLM through **LangChain**
- Created the baseline framework in **Python** for future information retrieval research within the OCIO DHS.

Red Cheetah Foundation   Jan 2023 - June 2023
Computer Science Tutor   *Cupertino, CA*
- Taught a class of 15 middle school students basic web development skills involving HTML, CSS, and Javascript.
- Developed an engaging curriculum that guided students in building and hosting a final portfolio website.

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.
- Set up **Docker Containers**, giving each individual problem its own secure environment.

Identifying NEOs with NASA WISE   June 2021 – March 2022
ML Researcher   *Cupertino, CA*
- Used **Tensorflow** to identify 40+ Near Earth Objects in NASA's WISE database via image subtraction.
- 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.

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)