Joshua Zhang

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Education

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

Experience

Art of Problem Solving June 2024 - Current
SWE Intern *San Diego, CA*
- Migrated the AOPS Academy Website from an old PHP framework to a new **NextJs** and **Fastify** design.
- Implemented an online placement exam system using Typescript used in 12 physical campuses and 20,000+ students.
- Used **Strapi, Jest, and Storybook** to ensure codebase scalability and allow content teams to easily create new sites.

Advanced Robotics at UW Sept 2023 - Current
Controls Software Team *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** in all RoboMaster competition formats inside North America 2024.

Department of Homeland Security June 2023 - Aug. 2023
SWE 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+% connecting it with a **ChromaDB** Vector Database, demonstrating the practical 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
Software Engineer *Cupertino, CA*
- Ran Capture the Flag competition with 70 unique problems, 600+ participants from 28 different 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.

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.

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

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)