Joshua Zhang

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Education

University of Washington Seattle, WA
Intended Bachelor of Science in Electrical and Computer Engineering *June 2026*

Experience

Department of Homeland Security June 2023 - Aug. 2023
Summer 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 LLM document processing by 30+% connecting it with a ChromaDB Vector Database, demonstrating the practical applicability of LLMs for document processing and information retrieval.
- Integrated Text-generation-webui with LangChain using an proxied OpenAI server, allowing Vicuna to communicate with LangChain tools.

FweefwopCTF Web Developer May 2021 – June 2022
Monta Vista High School *Cupertino, CA*

- Helped run 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.
- Created a Flask API server to fetch song recommendations.
- Built a beautiful frontend using Next.js and Tailwind, giving users a graphical visualization of songs and their recommendations.
- Hosted the server on a Microsoft Azure Virtual Machine.

Racketeer Games Blog | *Nuxt, Vue 3, Tailwind, Firebase, Javascript*

- Developed a blog site with User login/signup, Likes, Read/Post, and commenting features.
- Constructed a WYSIWYG editor with text, video, and image formatting options similar to Google Docs.
- Designed a dynamic tag system with auto-fill functionality, enabling selection from existing tags or creation of new ones, while facilitating efficient post search by tags.

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.
- Built a Flask + SQLITE server and a Next.Js + Tailwind frontend allowing users to easily browse through their database.

Identifying NEOs using Tensorflow in NASA WISE data | *Tensorflow, Python*

- 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.

Technical Skills

Languages: Typescript, Javascript, Python, Java, C++, SQL, HTML/CSS, Bash
Frameworks: Nuxt 3, Vue 3, React, NextJs, Tailwind, Tensorflow, PyTorch
Developer Tools: Git, VSCode, Visual Studio, Microsoft Azure, Firebase, Eclipse, Burp Suite
Libraries: Pandas, NumPy, Matplotlib, Scikit-Learn, SciPy, Seaborn, BeautifulSoup
Awards: USAPhO Top 300 (2021, 2022), National Cyber Scholar (2022, 2023)