Ernie Wang

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Education

Northwestern University Evanston, IL

B.S. in Computer Science, B.S. in Jazz Studies ***GPA: 3.65/4.0*** *Jun. 2025*

- **Relevant Coursework:** Data Structures & Algorithms, Computer Architecture, Databases, Security, Information Systems, Machine Learning/AI, Operating Systems, Scalable Software Architecture, Distributed Systems

Technical Skills

Languages: Python, JavaScript/TypeScript, C++, Racket, Java, Golang
Frameworks/Tools: Git, Linux, HTTP, JSON, XML, Flask, FastAPI, BeautifulSoup, NumPy, Pandas, React, AWS, Node, MySQL, SQlite, NextJS, Tailwind
Other: Finale, Logic Pro X, Adobe Photoshop, Final Cut Pro X

Work and Project Experience

Computer Vision Developer | *Python, p5.js, PoseNet, Flask, Node* Mar. 2025 – Present

- Designed and implemented a web application that captures poses using PoseNet (p5.js) and a machine generation model (VampNet) to continuously generate music in response to video capture.
- Engineered real-time tempo detection using FFT on joint velocity time-series, leveraging JavaScript math libraries for precision.
- Developed adaptive frontend controls to modulate model inputs in near real time utilizing most recent pose data and music theory heuristics.

Harmonizer | *Python, JavaScript, HTML, CSS, XML, FastAPI, JSON* Nov. 2024 – Present

- Developed a web application utilizing FastAPI, enabling musicians to upload melodies in MusicXML/MXL format and download modified XML files with melodies harmonized programmatically to the existing harmony.
- Built a customizable JSON rules dataset supporting thousands of note-chord combinations and common harmonization options.
- Stored user-defined presets locally in the browser cache, with future plans to transition to SQLite-based storage.
- Conducted extensive test cases to handle edge cases, enabling a cyclical development process as new features were added.
- Implemented RESTful APIs to manage XML file exchange and streamline client-server communication.

Curriculum Planner | *Python, JSON, BeautifulSoup, HTTP, HTML/CSS/JavaScript, React* Mar. 2024 – Jun. 2024

- Built a full-stack application with React enabling users to search for classes, with GPT API support for course recommendations.
- Processed and filtered course information into embeddings, using cosine similarity to match user queries before delegating to GPT for refinement.
- Integrated OpenAI's function calling to dynamically adjust filtered class suggestions and improve response accuracy.
- Worked in an Agile Scrum environment, managing responsibilities across a collaborative team and hitting project milestones.

Machine Learning Project | *Python, Conda, Pandas, Scikit-learn, Jupyter Notebook, NumPy* March 2023 - May 2023

- Collaborated on a machine learning model predicting "awesomeness" of CDs from Amazon reviews, achieving 72% accuracy.
- Used Pandas and NumPy for data cleaning and preprocessing, structured within a Waterfall development cycle.
- Improved model performance from 61% to 76% accuracy and increased F1 score from 0.69 to 0.75 via trimming and vectorization.
- Evaluated model options including Naive Bayes, Random Forest, and Decision Trees using selected review features.

Other Experience

G2i — Engineer for AI Training Data Jun. 2024 – Jul. 2024

- Evaluated and ranked outputs from Scale AI's LLM, offering detailed feedback on ethical considerations, language clarity, and visual coherence.
- Ensured responses met factual accuracy standards to improve AI model performance and reliability.

Musical Artist (Self-Employed) Sep. 2020 – Present

- Performed with Northwestern University Jazz Orchestra (2020–2024) and in a variety of university bands, featuring both live and virtual gigs.
- Utilized AI music generation tools (Musicfy, Udio) alongside custom scripts to explore digital composition and arrangement.
- Conducted private lessons, teaching saxophone/clarinet fundamentals and improvisational listening skills to a broad range of students.