Ernie Wang

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Education

Northwestern University, Computer Science and Jazz Studies — Evanston, IL

Sept 2021 – June 2025

- GPA: 3.61/4.0
- 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, Go

Frameworks/Tools: Git, Linux, XML, Flask, FastAPI, BeautifulSoup, NumPy, Pydantic, Pandas, Supabase, React, AWS, Node, MySQL, SQLite, NextJS, Tailwind, Electron, Puppeteer, Selenium

Other: Finale, Logic Pro X, Adobe Photoshop, Final Cut Pro X, Musescore

Work and Projects

Northwestern University - Computer Vision Developer, *Python*, *p5.js*, *PoseNet*, *Flask*, *Node.js* — Mar 2025 – June 2025

- Established endpoints on an audio file's playbackrate, volume, and pitch that listen to tempo changes via websockets (Socket.io)
- Architected a distributed software utilizing Node.js for reciving and inteperting data and Flask (python) to run the music generation model
- Engineered real-time tempo approximator that measures the period of movement by running a FFT over the captured velocity data over a specified time interval
- Performed linear interpolation and outlier filtering on captured posedata to smooth out and standardize approximated velocity, significantly improving consistency
- Developed a adjustable parameters such as normilization, and frames per second that allow users on the frontend to change the sensitivieties of input and capture rate to match the dancer

Harmonizer, *Python*, *JavaScript*, *HTML*, *CSS*, *XML*, *FastAPI*, *JSON* — Nov 2024 – present

- Developed a web application enabling musicians to upload melodies in MusicXML/MXL format and download modified XML files with melodies harmonized programmatically into a musical soli
- Stored user-defined presets in browser local storage alongside a few well known haromization algorithms from well know arrangers(Count Basie, Stan Kenton, Thad Jones)
- Built a customizable fallback algorithm that harmonizes on a more consistent basis on note/harmony parings that were not successfull in the intial run
- Improved runtime speed of music XML parsing/modifying programs 9 times by caching runtime results in a json file that is eventually stored on the users localStorage.

Resume Tuner, *Python*, *JSON*, *HTTP*, *docx*, *Next.js*, *Tailwind CSS* — Mar 2025 – present

- Designed a multipaged UI to create, modify, and save a megaresume utilizing Electron's IPC utilizing React and TailwindCSS
- Cut token usage nearly 50% by directing LLMs to reply with indexed outputs instead of echoing input context.
- Designed and implemented interactive suggestion review system in the UI with Accept/Reject/Edit options for each AI-generated resume improvement.
- Broaded the project to utilize plugin-based architecture supporting multiple AI providers with encrypted local storage utilizing node-keytar and model controll in the UI

MuseCatalog, *Node.js*, *SQL*, *AWS-RDS*, *AWS-EC2*, *Spotify-API*, *ChatGPT-API* — Mar 2023 – May 2023

- Developed a music recommendation platform integrating OpenAI's GPT API with the Spotify's Web API, enabling dynamic playlist generation from natural language queries.
- Implemented relational data persistence using Amazon RDS (MySQL), storing user accounts, playlists, and historical queries to enhance personalization
- Deployed backend services on Amazon EC2, handling user authentication and API communication
- Designed and documented a RESTful API with endpoints for song discovery, listing favorites, history, catalog reset, and recommendation refinement.

Other Experience

G2i, Engineer for AI Training Data — June 2024 – July 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.
- Skills: *AI Training*, *Evaluation*, *Data Annotation*

Self-Employed, Musician — Sept 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.
- Skills: *Performance*, *Jazz Improvisation*, *AI Music Tools*, *Teaching*