

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, Muscore

Work and Projects

Northwestern University - Computer Vision Developer, *Python, p5.js, PoseNet, Flask, Node.js*

Mar 2025 – June 2025

- Designed and implemented a browser application utilizing PoseNet(p5.js/m15) to capture and analyze dance poses via a webcam
- 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 receiving and interpreting data and Flask (python) to run the music generation model
- Developed adjustable parameters such as normalization, and frames per second that allow users on the frontend to change the sensitivities of input and capture rate to match the dancer
- Performed linear interpolation and outlier filtering on captured posedata to smooth out and standardize approximated velocity, significantly improving consistency

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 solo
- Stored user-defined presets in browser local storage alongside a few well known harmonization algorithms from well known arrangers(Count Basie, Stan Kenton, Thad Jones)
- Provided a heuristics modifier based off of chord structure from Music21 (python), supporting thousands of note-chord combinations and common harmonization options
- Built a customizable fallback algorithm that harmonizes on a more consistent basis on note/harmony pairings that were not successful in the initial 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 user's localStorage.

Resume Tuner, *Python, JSON, HTTP, docx, Next.js, Tailwind CSS*

Mar 2025 – present

- Developed a desktop application with Electron JS utilizes LLMs to select attributes of experiences and projects that best fit a job description
- Developed interactive suggestion review system in the UI with Accept/Reject/Edit options for each AI-generated resume improvement.
- Cut token usage nearly 50% by directing LLMs to reply with indexed outputs instead of echoing input context.
- Developing an optional keyword extraction preprocessing stage that selects keywords and verbs and upgrades them to match keywords of the job description

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.

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.