

# Ernie Wang

📍 Evanston, IL    ✉ erniewang2025@u.northwestern.edu    ☎ (469) 961-3315    🌐 erniewang.com/erniewebpublic    🔄 erniewang

## 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 web application that video-captures poses and modifies a music loop using PoseNet (p5.js)
- Engineered real-time tempo approximator that measures the rhythm of motion utilizing a FFT a velocity time series that pitch shifts, alter playbackrate, and changes the volume of the audio accordingly
- Integrated with Vampnet that will continously generate new music based off the standard deviation over the range of motion
- Utilized a Node server that recieves motion data from the browser via websocket emits to perform more intensive mathemticaly operations on the time series data
- Developed a adjustable parameters such as normilization, and frames per second that allow the frontend application to adapt to the speed, height, and size of the dancer

**Harmonizer**, *Python, JavaScript, HTML, CSS, XML, FastAPI, JSON*

Nov 2024 – present

- Conducted extensive test cases to handle edge cases, enabling a cyclical development process as new chords were added and encountered.
- Developed custom XML parser optimized for MusicXML format with error handling for malformed music files.
- Stored user-defined presets in browser local storage, with future plans to server side storage
- Built a customizable fallback algorithm that harmonizes and writes for notes for notes that were missed in previous runs

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

Mar 2025 – present

- Developed a desktop application that selects attributes of experiences and projects that best fit given a job description.
- Built cross-platform Electron/React application with TailwindCSS for dynamic resume optimization.
- Implemented an AI pipeline processing resume section by section while managing API rate limits.
- Included a option keyword extration preprocessing storage to select relevant keywords to utilize in resume filtering.
- Developed interactive suggestion review system in the UI with Accept/Reject/Edit options for each AI-generated resume improvement.

**MuseCatalog**, *Node.js, SQL, AWS-RDS, AWS-EC2, Spotify-API, ChatGPT-API*

Mar 2023 – May 2023

- Deployed backend services on Amazon EC2, handling user authentication and API communication
- 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
- Built sentiment analysis pipeline using OpenAI embeddings to categorize user music preferences and mood-based recommendations.
- Created Redis caching layer to optimize API response times and reduce external API calls by 60%.

## Other Experience

**G2i**, Engineer for AI Training Data

June 2024 – July 2024

- Collaborated with cross-functional teams to identify bias patterns and recommend model training improvements for better ethical alignment.
- Analyzed statistical trends in AI output quality using Python data analysis tools to provide actionable insights for model optimization.
- Created detailed annotation guidelines and training materials for new evaluators to maintain consistency in AI training data quality.

**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.
- Conducted private lessons, teaching saxophone/clarinet fundamentals and improvisational listening skills to a broad range of students.
- Developed custom Python scripts for MIDI manipulation and automated music arrangement using music21 library for compositional workflows.
- Created video content and tutorials for online music education platforms, reaching over 500 students across different skill levels.
- Built personal brand through social media presence and live streaming performances, growing audience engagement by 200% over two years.