ALEXANDER (XANDER) TOTH

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SOFTWARE ENGINEER — DEVOPS & SYSTEMS • MACHINE LEARNING • FULL STACK

Specializing in **real-time systems, developer tooling,** and **data reliability**.
Creative background in audio/visual applications and computer music.

TECHNICAL SKILLS

Languages:	C, C++, Python, Bash, Java, SQL, Powershell, GLSL
DevOps/Deployment:	Git, Docker, SBuild, Make, CMake, pytest, autopkgtest
Infrastructure/Systems:	AWS, Linux administration (systemd, cron, networking)
Machine Learning:	PyTorch, Tensorflow, Scikit-learn, Ollama, LangChain, FAISS, UMAP
Full-Stack Development:	HTML/CSS, JavaScript/TypeScript, Vite, Node, React, Tailwind, Fast API
Audio/Graphics:	OpenGL, Miniaudio, Dear ImGui, Max/MSP/Jitter, Processing

SELECTED PROJECTS

grpr: ml + audio CLI tool   (Python, PyTorch, torchaudio, UMAP, LangChain, SQLite, FAISS, Docker)
- Extracts embeddings from audio files with Wav2Vec2 and fine-tuned projection heads.
- Reduces embeddings with UMAP and groups files with Gaussian Model Mixture.
- Organizes metadata with FAISS and SQLite; labels and queries audio with local LLMs via LangChain.

ezvz: audio-reactive visualizer   (C++, GLSL, OpenGL, ImGui, GLFW, GLAD, miniaudio)
- Maps values extracted from real-time audio features (RMS, ZCR, etc.) to graphic object transforms.
- Implements framebuffer-based rendering and custom GLSL shader pipeline.
- Incorporates system-level audio integration with miniaudio, uses filesystem API for dynamic file loading.

Autodactyl: LLM website   (Python, React, TypeScript, Postgres, Redis, LangChain, FastAPI, Caddy)
- Creates lessons, quizzes, exercises, and projects per user interaction with a local LLM.
- Persists courses, conversations, and metadata with Postgres.
- Manages APIs and middleware with FastAPI and Redis.

PROFESSIONAL EXPERIENCE

Adjunct Faculty   Indiana University, Jan 2024 - May 2024
- Lectured on audio DSP, MIDI, DAW functionality, acoustics, musical concepts.
- Redesigned curriculum for compatibility with Ableton 11 software.
- Updated Canvas HTMLs, graded with Excel.

OPEN SOURCE

Developer   mlx - actively contributing features and code reviews.
Maintainer   Le Biniou (Debian package) - ensuring stability, QA, and release management.

EDUCATION

MM, Computer Music and Composition   Indiana University, 2021 - 2023
- Vice-President of Student Composers Association
BM, Vocal Performance + Teaching Licensure   University of Iowa, 2014 - 2018
- High Distinction, University Honors