


# Luke Nittmann

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## EXPERIENCE

### Independent Projects (2023 - Present)

Building production-grade applications, focusing on AI-native experiences and real-time collaboration:

**Ther** <https://ther-app.vercel.app/>

*Empathetic AI companion for mental wellness*

Built supportive AI therapist system with personalized chat experience and agentic framework  
Implemented adaptive suggestion engine with contextual intelligence  
Developed secure subscription management with Stripe integration  
Created cross-platform experience with Tauri (iOS/macOS native support)

**Tech Stack:**

- **Frontend:** Next.js, React, TypeScript, Tailwind, Framer Motion
- **Backend:** Prisma, PostgreSQL
- **AI/ML:** Gemini API, Prompt Engineering
- **Payments:** Stripe Connect, Payments API
- **Cross-platform:** Tauri
- **State/Utilities:** Zustand, Zod, SWR

**Cards** <https://cards-xyz.vercel.app/>

*Personalized job application tracking platform with AI capabilities*

Designed multi-provider agentic system with model abstraction for varied AI responses  
Built embedding-based job-resume matching system for intelligent recommendations  
Generated personalized job application cards from user's links, resume, and web presence  
Implemented context-aware prompt engineering for coherent AI responses  
Created serverless AI processing pipeline with edge function optimization

**Tech Stack:**

- **Frontend:** Next.js, React, TypeScript, Tailwind, Framer Motion, shadcn/ui
- **Backend:** Prisma, NextAuth
- **Database:** Neon Database, Vercel KV, pgvector
- **AI/ML:** OpenRouter, Jina, Vercel AI SDK
- **State/Utilities:** Zustand, SWR, Zod

**Voet** <https://voet-app.vercel.app/>

*Football intelligence platform with AI-powered analysis*

Architected real-time data aggregation system with multi-source orchestration  
Implemented intelligent content analysis with entity recognition using agentic workflows  
Built distributed job queue for resilient scheduled data updates  
Developed relational schema with rich entity relationships

**Tech Stack:**

- **Frontend:** Next.js, TypeScript, Tailwind, Framer Motion, Recharts
- **Backend:** Prisma, Redis, Upstash, tRPC
- **Database:** PostgreSQL
- **AI/ML:** Gemini API, Jina, Vector DB, Embeddings
- **Data Extraction:** Cheerio, Puppeteer, Playwright
- **State/Utilities:** SWR, Zustand, MSW, Zod

**Squish** <https://squish-web.vercel.app/>

*Semantic social network for content sharing and discovery*

Developed embedding-based content organization system with semantic search  
Built real-time collaborative boards with interactive comments  
Created modular, service-based FastAPI backend with monorepo webapp  
Implemented fluid animations and interactions for enhanced UX

**Tech Stack:**

- **Frontend:** Next.js, TypeScript, Tailwind, Motion, Radix UI, react-spring
- **Backend:** Python, FastAPI, asyncio, pydantic
- **Database:** PostgreSQL, pgvector, Neon
- **Collaboration:** Liveblocks, WebSockets
- **AI/ML:** VertexAI, OpenAI, CLIP, Vector Embeddings
- **Infrastructure:** Docker, Railway
- **Architecture:** Turborepo, NX, Module Federation

**Loops** <https://loops-app.vercel.app/>

*Stem player for your music with intelligent audio processing*

React / Next.js web app with 4 independent stem track audio loops  
Built AI-powered stem isolation system for vocals, drums, bass, and other  
Implemented client-side audio processing engine with Web Audio API  
Developed efficient audio file streaming and caching system

**Tech Stack:**

- **Frontend:** Next.js, React, TypeScript, Tailwind, Framer Motion
- **Audio:** Tone.js, Web Audio API, AudioWorklet, WebMIDI, FFmpeg.wasm
- **Backend:** FastAPI, Python
- **Storage:** Vercel KV, Vercel Blob Storage
- **AI/ML:** Spleeter
- **Infrastructure:** Docker, Railway, AWS Lambda
- **State:** Zustand, Redux Toolkit, Immer

**Sine** <https://sine.app>

*MIDI-based beatmaking app for iOS*

Built native iOS client with comprehensive MIDI engine and patterns  
Developed web-based MIDI/sound pack upload utility  
Implemented AI audio manipulation and semantic search with agentic asset organization  
Created real-time sync with websocket streaming

**Tech Stack:**

- **iOS:** Swift, AVFoundation, AudioKit, CoreAudio, MIDIKit, App Intents
- **Web:** Next.js, TypeScript
- **Audio:** Pedalboard, FFmpeg, Soundpipe, AudioUnits, VST3
- **Database:** PostgreSQL, Core Data
- **AI/ML:** VertexAI, OpenAI, Audio Embeddings
- **Cloud:** GCP, Cloud Storage, Cloud Run

*Demo materials available at [luke-nittmann.vercel.app/projects](https://luke-nittmann.vercel.app/projects)*

### Titles, Inc.

*Senior Software Engineer (Remote) | May 2024 - November 2024*

Led development of cross-platform notification system for web3 image generation platform  
Built semantic image search system with Gemini multimodal embeddings and agentic asset organization  
Architected full-stack features across iOS, web, and backend systems

**Technologies:**

- **Frontend:** React, TypeScript, Tailwind CSS, React Three Fiber
- **Mobile:** Swift, SwiftUI
- **Backend:** Firebase, Cloud Functions, Firestore
- **Cloud:** GCP, Cloud Run, Vertex AI
- **AI/ML:** Gemini API, Multimodal Embeddings, Stable Diffusion, Flux, ComfyUI
- **Web3:** Ethereum, IPFS, Smart Contracts
- **DevOps:** CI/CD, Docker

Stems Labs

Senior Software Engineer (Remote) | November 2022 - Present

- Led creation and development of Stem Studio, a mobile audio remixing platform
- Architected full-stack system for professional audio processing with intelligent agents for effects recommendation
- Integrated Python audio models and CoreML for on-device audio processing
- Optimized processing costs through AI-powered effects generation
- Built integration layer supporting major streaming platforms (Spotify, Apple Music)

- Stack:
- Mobile: Swift, AVFoundation, CoreAudio, AudioKit, MIDI
  - Frontend: React, WebGL
  - Backend: Python, Golang, FastAPI, GraphQL, Redis
  - AI/ML: OpenAI, Stable Audio, Demucs, Pedalboard, CoreML, PyTorch
  - Audio: VST3, AudioUnits, FFmpeg, Pedalboard
  - Cloud: AWS, S3, Lambda, EC2, SQS
  - Database: PostgreSQL

Amazon, Inc.

Software Engineer, Address Intelligence (Portland, OR) | June 2019 - December 2021

- Promoted to SDE II within 18 months
- Architected address management system for delivery route optimization
- Improved cross-region performance through stack regionalization
- Built self-service permission system automating internal workflows
- Maintained high service reliability across multiple regions
- Led migration from monolith to microservices architecture

- Technologies:
- Frontend: React Native, TypeScript, Redux, Jest
  - Cloud: AWS, Lambda, DynamoDB, S3, CloudFormation
  - Backend: Java, Python, Node.js, Redis
  - Database: DynamoDB, Aurora PostgreSQL
  - DevOps: CI/CD, Docker, Terraform, CloudWatch
  - Architecture: Microservices, Event-driven, Serverless

AWS Elemental

Software Engineer, AWS MediaConvert (Portland, OR) | January 2018 - June 2019

- Optimized video transcoding engine for improved performance
- Rewrote Quicktime decoder enhancing metadata parsing accuracy
- Developed automated testing framework for validation components
- Resolved customer issues through direct support and code changes

- Technologies:
- Languages: C++, Python, Ruby
  - Cloud: AWS, EC2, S3, CloudFront
  - Media: FFmpeg, H.264/H.265, VP9, AV1
  - Infrastructure: Docker, Jenkins, Terraform
  - Performance: SIMD, Threading, GPU Acceleration
  - Testing: GTest, Pytest, Selenium

EDUCATION

University of Michigan, Ann Arbor

BSc in Computer Science and German Studies (2017)

SKILLS

Programming Languages

- Swift (5+ years)
- Python (7+ years)
- Java
- Ruby
- TypeScript (6+ years)
- C/C++ (8+ years)
- Golang

Frontend

- React
- Next.js
- SwiftUI
- TailwindCSS
- Framer Motion
- Radix UI
- react-spring
- Recharts
- shadcn/ui
- WebGL
- React Three Fiber
- React Native
- Redux
- Motion

Backend

- FastAPI
- Node.js
- Java
- GraphQL
- Prisma ORM
- NextAuth
- Cloud Functions
- pydantic
- asyncio
- trPC
- WebSockets
- Firebase
- Firestore

Database

- PostgreSQL
- pgvector
- Redis
- Upstash
- DynamoDB
- Vercel Blob Storage
- Core Data
- Aurora PostgreSQL
- Neon DB
- Vercel KV

Audio / Video

- AVFoundation
- FFmpeg
- AudioKit
- CoreAudio
- AudioUnits
- MIDI
- MIDIKit
- Spleeter
- Demucs
- AudioWorklet
- WebMIDI
- H.264/H.265
- VP9
- AV1
- Web Audio API
- Tone.js
- Pedalboard
- VST3
- Python audio models
- Soundpipe
- Stable Audio

AI/ML

- LLMs
- OpenAI
- Gemini
- Claude
- OpenRouter
- PyTorch
- CLIP
- Multimodal AI
- Semantic search
- Agentic systems
- Stable Diffusion
- Flux
- Vector Embeddings
- VertexAI
- Jina
- CoreML
- Context management
- Prompt engineering
- ComfyUI
- Vercel AI SDK
- Multimodal Embeddings

Cloud & Infrastructure

- AWS
- Lambda
- S3
- EC2
- SQS
- CloudFront
- GCP
- Edge Runtime
- Edge Functions
- Firebase
- Railway
- Serverless architecture
- CloudFormation
- Cloud Run
- Cloud Storage
- Vertex AI
- Vercel
- Distributed systems
- Edge computing
- CloudWatch
- Microservices
- Event-driven

Data & Testing

- Jest
- GTest
- Pytest
- Selenium
- MSW
- Cheerio
- Puppeteer
- Playwright

Tools & Practices

- Git
- Vim
- Docker
- CI/CD
- Monitoring
- Tauri
- Liveblocks
- Module Federation
- NX
- SIMD
- Turborepo
- Monorepo
- Terraform
- Jenkins
- Threading
- GPU Acceleration
- App Intents

State Management

- Zustand
- Redux Toolkit
- Immer
- SWR
- Zod