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-xyz.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-labs.com
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

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