ALEX FANG

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SUMMARY

Software engineer with graduate degrees in both computer science and classical piano; returning to engineering full-time, bringing technical depth, creative perspective, and passion for building meaningful solutions.

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, Java, C/C++, C#, Rust, HTML/CSS
Frameworks/Libraries: Express/Node.js, React, Prisma, Web Audio API, Flask, librosa, music21
Tools/Technologies: Git, PostgreSQL, Vite, Docker, Railway

PROJECTS & PUBLICATIONS

ColorImprov | React, Express, Prisma+PostgreSQL, Cloudflare R2, Vite, Web Audio API, Railway Jan 2026 – present
Full-stack blues improv trainer with real-time note visualization and scaffolded hints colorimprov.alexfang.me

- Independently expanded a hackathon-winning concept (team of 4) into modular React app with mobile support
- Syncs on-screen hints to backing track via Web Audio API's MediaElementAudioSourceNode
- Persists auth-gated user recordings (audio + event log) to Cloudflare R2 with Postgres-tracked metadata
- Reconciles cross-device preferences with localStorage fallback and guided conflict resolution on login

Continual Dataset Augmentation for Music Generation | ICML Workshop, 2020 | Python, music21 Jun 2020
A. Fang et al. "Bach or Mock? A Grading Function for Chorales in the Style of J.S. Bach."
A. Liu, **A. Fang** et al. "Incorporating Music Knowledge in Continual Dataset Augmentation for Music Generation."

- Designed and implemented grading function evaluating Bach-style chorales across musical features, achieving 92.6% accuracy distinguishing real Bach from AI-generated chorales, outperforming human experts (86.7%)
- Used grading function to filter AI-generated data for training Transformer-based music generation model

WORK EXPERIENCE

Piano Performer & Teacher Evanston, IL | San Francisco, CA | Seattle, WA
Freelance | UW Secondary Piano Teaching Assistant | Cascade Piano Studio Sep 2017 – present

- Perform in high-pressure settings as soloist and chamber musician; won SFCM Concerto Competition
- Teach 100+ students over 8 years across all ages and skill levels through private lessons and group classes, identifying conceptual gaps, developing curricula, and individualizing approach based on goals and needs

Optum | UnitedHealth Group Schaumburg, IL
Software Development Intern Jun – Aug 2017

- Investigated Docker containerization; presented proof of concept to managers, addressing dev lifecycle friction
- Contributed to migration of Java IVR application from Tomcat to JBoss
- Prototyped React/Node.js webapp (team of 5), connecting admin to clients regarding healthcare services

EDUCATION

Northwestern University Evanston, IL
M.S. in Computer Science Dec 2019
B.A. in Computer Science & B.M. in Piano Performance, *magna cum laude* (GPA: 3.89/4.00) Jun 2019

Relevant Coursework: Machine Learning, Natural Language Processing, Algorithms, Databases, Programming Languages, Systems Programming in Rust, Machine Perception of Music & Audio

San Francisco Conservatory of Music San Francisco, CA
Master of Music in Piano Performance May 2022

University of Washington Seattle, WA
Doctoral Candidate in Piano Performance (ABD) Sep 2022 – present