

Pratham Vadhulas

prathamvadhulas@gmail.com | [LinkedIn: pratham-vadhulas](#) | [GitHub: rp-bot](#) | prathamvadhulas.com

PROFESSIONAL SUMMARY

Technology innovator with expertise in **AI, full-stack development**, and music technology. Specialized in **data engineering** for large audio datasets, **machine learning** models, and audio processing solutions with demonstrated success in research and client-facing environments.

TECHNICAL EXPERTISE

Programming Languages: Python, C++, Rust, JavaScript, TypeScript, Java, SQL

Programming Paradigms: Object-Oriented Programming (OOP)

Relevant Coursework: Data Structures and Algorithms, Operating Systems, Computer Architecture, Software Engineering, Machine Learning, AI, Computer Networks, Database Systems, Linear Algebra, Calculus.

Frameworks & Technologies: NextJS, React, React Native, Vue.js, Three.js, NodeJS, PyTorch

Audio & Music: Digital Signal Processing, Max/MSP, JUCE, music21, Plugin Development

Data & ML: Machine Learning, Transformer Architecture, CUDA, GPU Acceleration, Computer Vision

IoT Hardware: Arduino, Raspberry Pi, Sensor Integration, Wi-Fi Communication

Infrastructure: Git, CI/CD pipelining, Linux, macOS, Supabase, Firebase, AWS, GCP, Terraform, CDN, Cloudflare Tunnels, AI Agents

PROFESSIONAL EXPERIENCE

Music Informatics Lab, Georgia Tech

Atlanta, GA | Jan 2025 – Present

- Contributed to AI-driven research on music analysis and generation, focusing on Music Information Retrieval.
- Implemented CUDA-based GPU acceleration** and mem-mapping, achieving 20x speedup for large audio dataset processing.
- Establish research methodologies including literature reviews and baseline model development.

Freelance Full Stack Developer

Atlanta, GA | October 2023 – Present

- Engineered** scalable real-time apps for 10k+ concurrent users with low-latency media streaming.
- Reduced** application latency and load times to achieve near-instantaneous user interaction.
- Implemented** secure authentication systems (Auth0, Supabase/Firebase) to protect user data and assets.
- Developed high-availability solutions for data-intensive applications, enhancing platform reliability.

Center for Research and Learning(CRL)

Indianapolis, IN | May - Aug 2023

- Engineered** neural network using PyTorch implementing **Transformer Architecture** for music generation.
- Optimized** model to generate chord progressions with 60% more diverse velocity, enhancing human-like sound quality.
- Presented research findings at CRL Symposium 2023, receiving academic scholarship for outstanding performance.

PROJECTS

MIDI Gen AI | Generative AI

Designed and **implemented** a **Large Language Model (LLM)** that predicts musical chords, trained on 20.9M MIDI tokens. Applied advanced music theory principles to enhance generation quality and musical coherence.

Eco-charge | Hackathon 3rd Place Winner

Developed a tool optimizing EV charging schedules to minimize **CO₂ emissions** during the vehicle use phase. Applied data analytics to predict optimal charging windows based on grid carbon intensity

AI-Powered Operations Platform | Freelance project

Architected and engineered a comprehensive, cloud-native platform to automate complex workflows and streamline core operational processes for an enterprise client.

Home Security System | IoT Solution

Engineered **Arduino and ESP32 Wi-Fi** system for real-time security monitoring with sensor integration. Implemented custom **firmware** for reliable data streaming and alert mechanisms.

EDUCATION

Georgia Institute of Technology

Atlanta, GA | May 2026

Master of Science, Music Technology

Purdue University

Indianapolis, IN | May 2024

Bachelor of Science, Computer Science