Shaozhi Pi

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PhD candidate, UNSW | Game music and audio software

EDUCATION

UNSW | PhD in Art & Design (Creative Technologies) 2026 - 2030 (expected)
Research: Adaptive AI Music Generation for Video Games

University of Southern California | M.S., Operations Research Engineering 2021 - 2023

Chongqing University of Posts and Telecommunications 2017 - 2021
B.Eng. in Electrical and Computer Engineering

TECHNICAL SKILLS

Languages: Python, JavaScript / TypeScript, Java, C++, SQL.
Audio & data: PyTorch, ONNX, NumPy, SciPy, pandas, MIDI, Tone.js.
Software: React, Node.js / Fastify, Zod, SQLite, Git.

SELECTED RESEARCH & ENGINEERING

Composer-Controlled Adaptive Music Systems | *Doctoral research, UNSW* 02/2026 - Present
- Study how AI can adapt game music to player actions while preserving the composer's musical intentions.
- Built an offline prototype with composer-defined decision rules; filtered LLM proposals for instrument changes and generated approved parts with ACE-Step.
- Compared decisions across 10 scripted scenarios and assessed 36 mixes in a single-composer study; this offline work is a step towards a real-time game music system.

LLM-Driven DSP Graph Generator | *JavaScript, Node.js, Web Audio* 12/2025 - 02/2026
- Built a browser prototype for creating and editing synthesizer and effects graphs from natural-language prompts.
- Converted model responses into supported audio operations in a Fastify service; validated actions with Zod to reject invalid edits before changing the graph.
- Built a React Flow graph view with Tone.js playback and parameter controls; users can inspect the signal graph, adjust parameters and hear the resulting sound.

Reference-Based Speaker Matching | *Python, PyTorch, ONNX* **| GitHub** 10/2025 - 12/2025
- Built a Python batch tool to find and export speech segments matching reference voices across audio recordings.
- Integrated Silero VAD and NVIDIA TitaNet embeddings with cosine similarity scoring, then merged neighbouring matches to collect continuous speech segments.
- Added GPU batching and threaded audio loading for batch processing; exported WAV clips and timestamps while retaining source sample rates and channels.

Music Generation Using Markov Models | *Nyquist, Python* 07/2024 - 09/2024
- Implemented hierarchical music generation in Nyquist to study structure across song sections; used Python and cross-entropy analysis to assess generated music under Prof. Roger B. Dannenberg.

Multi-Armed Bandit Performance Optimisation | *Python* **| Paper [2]** 04/2023 - 07/2023
- Compared three bandit algorithms on MovieLens to study cumulative regret across parameter settings; precomputed reward distributions and parallelised repeated experiments in Python.

ADDITIONAL SOFTWARE ENGINEERING

Android Trajectory & Temperature Recorder | *Java, SQLite* 01/2021 - 06/2021
- Built a Java Android app to record and review temperature and location history, using MVC, Bluetooth sockets and SQLite storage with GreenDAO.

Smart Home Communication & Control | *C++, Modbus RTU / TCP* 06/2020 - 09/2020
- Developed a Visual C++ SCADA prototype for temperature monitoring and control; implemented Modbus RTU / TCP communication, a serial-port class and hysteresis/PID control.

PUBLICATIONS

[1] **Pi, S.** Analysis and Comparison of Algorithmic Composition Using Transformer-Based Models. *(Review)*
Proc. Data Analysis and Machine Learning (DAML 2024), 184-191. DOI: 10.5220/0013512300004619

[2] **Pi, S.** Optimization strategy for the pull arm function in the Multi-Armed Bandit algorithm.
Applied and Computational Engineering, 34 (2024), 170-178. DOI: 10.54254/2755-2721/34/20230321

PROFESSIONAL EXPERIENCE

Car Pricing Strategist | Liberty Mutual Group, China Headquarters 03/2024 - 09/2024
- Applied stochastic modelling and decision theory to pricing analysis; maintained and validated reporting data.