Qixin (Lindsey) Deng

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TL;DR

I am a Master's student in Electrical Engineering at Northwestern University, focusing on AI for audio and music. My research aims to develop perceptually grounded AI tools for sound design and music creation.

Research Interest: AI for Audio, Music Information Retrieval, Audio Signal Processing

EDUCATION

Northwestern University, Evanston, IL *Sep 2024 – Dec 2025*
Master of Science in Electrical Engineering (GPA:3.86/4.00)
- Core Courses: Machine Learning, Deep Learning, Digital Signal Processing, Statistical Pattern Recognition

University of Rochester, Rochester, NY *Aug 2021 – May 2024*
Bachelor of Science in Audio and Music Engineering | Minor in Computer Science
GPA: 3.96/4.00 | Magna Cum Laude | Highest Distinction
- Core Courses: Audio Signal Processing, Audio Software Development, Computer Audition, Musical Acoustics

PUBLICATIONS

- **Q. Deng**, Q. Yang, R. Yuan, Y. Huang, Y. Wang, X. Liu, Z. Tian, J. Pan, G. Zhang, H. Lin, Y. Li, Y. Ma, J. Fu, C. Lin, E. Benetos, W. Wang, G. Xia, W. Xue, Y. Guo,
"ComposerX: Multi-Agent Symbolic Music Composition with LLMs," in *Proceedings of the 25th International Society for Music Information Retrieval (ISMIR)*, 2024.
- F. Cwitkowitz, C. Benetatos, **Q. Deng**, H. Yu, N. Pruyne, P. O'Reilly, H. Flores Garcia, Z. Duan, B. Pardo,
"HARP 3.0: Generalizing I/O and API Support for Machine Learning in Digital Audio Workstations," in *NeurIPS 2025 Workshop on AI for Music*.

UNDER REVIEW

- **Q. Deng**, B. Pardo, T. N. Pappas,
"Do Joint Language-Audio Embeddings Encode Perceptual Timbre Semantics?" submitted to *ICASSP*, 2026.
- C. Hao, R. Yuan, J. Yao, **Q. Deng**, X. Bai, W. Xue, L. Xie,
"SongFormer: Scaling Music Structure Analysis with Heterogeneous Supervision" submitted to *ICASSP*, 2026.

RESEARCH EXPERIENCE

Interactive Audio Lab, Northwestern University *Sep 2024 – Present*
Graduate Researcher |Advisor: Bryan Pardo and Thrasyvoulos N. Pappas

- Investigating the perceptual semantics of timbre and developing methods to examine and align deep learning-based audio embeddings with human perception.
- Developing an AI-powered audio transformation interface that enables perceptual timbre semantic analysis to enable intuitive user interaction.
- Developing backend infrastructure for HARP, an audio sample editor that routes remote-hosted machine learning audio models into DAWs, by implementing a generalized API system and expanding frontend support to host a broader range of AI models.

Multimodal Art Projection + Hong Kong University of Science and Technology *Sep 2023 – Present*
Research Collaborator |Advisor: Wei Xue

- Researching the explainability in LLaMA2-based text-to-audio generation for stronger correspondence between lyrical and musical content.
- Collected SongFormDB and SongFormBench datasets, the largest corpus to date for music structure analysis.
- Designed ComposerX, a GPT-based multi-agent symbolic music generation framework, enabling expressive composition workflows for music creators.

University of Rochester *Jan 2024 – Apr 2024*
Undergraduate Researcher |Advisor: Michael Heilemann

- Recorded and processed guitar pedal distortion data from a Fender Telecaster distortion pedal and trained a WaveNet-baed model for high-fidelity audio emulation.

ACADEMIC PROJECTS

WheelTalks: Controlling Electric Wheelchairs Using Voice Commands

- Implemented a speech recognition algorithm using Arduino Uno and ELECHOUSE VR3 modules.
- Designed a hardware joystick interface attachment to enable voice controllability for electric wheelchairs.

MATLAB-based Sound Field Analysis

- Recorded impulse-response of a recording studio and assessed its acoustics features using Matlab(RT60, Schroeder decay, etc.) to optimize sound field quality.

Stochastic FM Synthesis Audio Plugin Development via C++ and JUCE

- Built an FM synthesis plugin using stochastic processes for parameter modulation via C++ and JUCE.

TEACHING EXPERIENCE

ECE 113: Circuits & Signals, University of Rochester *Spring 2023*
Workshop Leader (led weekly problem-solving sessions and supported student learning)

AWARDS & HONORS

Neurips AI for Music Workshop Student Grant	Fall 2025
Phi Beta Kappa Academic Honor Society	Spring 2024
Tau Beta Pi Engineering Honor Society	Fall 2023
Whipple Science and Research Scholarship, $12000/year, University of Rochester	Fall 2021 – Spring 2024

SKILLS AND INTERESTS

Programming languages	Python, C/C++, MATLAB
Audio Programming Language	Faust, MaxMSP
Tools	NumPy, PyTorch, LaTEX, Git, JUCE
Acoustical Measurement	CLIO, Room EQ Wizard
Hardware Design	LTSPICE, KiCad
Audio Engineering	studio recording, mixing, mastering in Logic Pro and Pro Tools
Music Instrument	piano, guitar