

Sara Adkins

contact

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web & git

saraadkins.com
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research interests

AI-generated music,
human-AI co-creation,
machine learning for
audio, ML optimization,
embedded ML, digital
instrument design

programming

C++, Python, C,
SuperCollider, C#,
TidalCycles, Assembly

frameworks

PyTorch, CUDA, JUCE,
HuggingFace, vLLM,
Tensorflow, AWS

software

Max MSP, Pure Data,
MATLAB, Ableton Live,
Logic Pro X, Pro Tools

hardware

ESP32, Raspberry Pi,
Bela, Teensy, HoloLens,
Leap Motion,
oscilloscopes,
soldering

music

classical & folk guitar,
live coding, analog
synthesizers, viola,
mandolin

organizations

Live Code Boston,
Audio Engineering
Society,
Phi Kappa Phi

work experience

- 2023-2024 **Senior Machine Learning Engineer, Neural Magic** Boston, MA
Developing open source software for high-performance LLM inference, focused on productionizing SOTA research in sparsification and quantization for deployment in vLLM.
- 2022-2023 **Generative Music and Audio Developer, Infinite Album** Remote, USA
Built a real-time generative music engine with adaptive emotion, in beta use by over 600 Twitch streamers. Worked with artists and sound designers to create interactive, infinite versions of their songs using classical and deep machine learning methods.
- 2022 **Research Assistant, QMUL Augmented Instruments Lab** London, UK
Developed a novel timbre transfer model for an electric violin pickup. Combined a regressed segmentation algorithm with a DDSP autoencoder to synthesize transients with improved reconstruction quality and latency compared to the DDSP baseline.
- 2019-2021 **Machine Learning Engineer, Bose Health** Boston, MA
Worked in an interdisciplinary research team designing ML algorithms for audio, integrating them into prototypes, and optimizing for production. Optimized an LSTM model for speech enhancement to run live on an embedded device using a neural accelerator chip. Technical lead for a research project developing generative & adaptive audio algorithms.
- 2018-2019 **Software & DSP Engineer, Bose Consumer Electronics** Boston, MA
Designed signal chain for adjustable EQ feature released on NC700 headphones and developed a sensor fusion in-ear detection algorithm released on SoundSport earbuds.

education

- 2021-2022 **Queen Mary University of London** London, UK
Master of Science in Sound & Music Computing, with Distinction
- 2014-2018 **Carnegie Mellon University** Pittsburgh, PA
Bachelors of Computer Science & Arts in Computer Science & Music Technology
University Honors, Intercollege Honors, Sound Design Minor.

honors & awards

- 2021 **US-UK Fulbright Postgraduate Award**
Full tuition grant and stipend to pursue music AI research and performance in the UK
- 2020 **Bose Key Talent Recognition Award**
Awarded by the Bose Health Director for exceptional contribution to the company

publications & presentations

- 2023 **Presentation, "Transformer-based Symbolic Music Generation: Fundamentals to Advanced Concepts"**
Led a 4-hour workshop at ISMIR 2023 on SOTA symbolic generation methods with hands-on examples, focusing on model architectures, datasets and style conditioning.
- 2023 **Publication, "LooperGP: A Loopable Sequence Model for Live Coding Performance"**
Outstanding Student Award at EvoMUSART 2023. Novel algorithm for generating loopable music phrases with a Transformer architecture. Results evaluated through a listening test.
- 2022 **Presentation, "Creative AI for Music Performance and Composition"**
Led a workshop at London Music Hackspace discussing high level concepts of RNNs and autoencoders, showcasing their uses in music composition and sound design.
- 2022 **Patent, "Audio processing using distributed machine learning model"**
Distributed audio processing between a wearable and wireless accessory device.
- 2020 **Patent, "Non-linear breath entrainment"**
Modulating a musical breathing stimulus based on bio-feedback in order to induce sleep.
- 2018 **Music Premiere, "Creating with the Machine: Algorithmic Composition for Live Performance"**
Designed three interactive generative music systems using Tensorflow and Max MSP. Led ensemble rehearsals and premiered the work in concert at the CMU School of Music.