Sara Adkins

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web & git
saraadkins.com
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research interests
machine learning for audio, AI-generated music, embedded ML, digital instrument design

programming
♥ C, C++, Python, SML, Assembly, Java, Objective-C

frameworks
PyTorch, Tensorflow, CUDA, JUCE, Hadoop, Spark, Pandas, SkLearn

software
Max MSP, PureData, MATLAB, ProTools, Logic Pro X, Unity

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

music
classical & folk guitar, analog synthesizers, viola, mandolin

organizations
Audio Engineering Society, Phi Kappa Phi, Sigma Alpha Iota

work experience

2022-now **Research Assistant, QMUL Augmented Instruments Lab** — London, UK
Developed a fused timbre transfer model for a violin augmented with an electrodynamic pickup. Combined a low-latency regressed segmentation algorithm with a DDSP autoencoder to synthesize note onsets with 6ms latency.

2019–2021 **Machine Learning Engineer, Bose Health** — Boston, MA
Worked with research and production teams to integrate machine learning algorithms into prototypes and optimize them for production applications.
Optimized a speech enhancement deep learning model using a neural accelerator unit, enabling it to run in real time on an embedded device.
Technical lead for a research project developing generative and adaptive audio algorithms. Developed prototype experiences for user testing and presented recommended production requirements to stakeholders, successfully transitioning the project into production.

2018-2019 **Software & DSP Engineer, Bose Consumer Electronics** — Boston, MA
Designed signal chain for adjustable EQ feature released on NC700 headphones.
Developed an in-ear detection algorithm using a fusion of sensors that achieved over 97% accuracy in user research studies. Implemented the algorithm in firmware.

education

2021–2022 **Queen Mary University of London** — London, UK
Master of Science in Sound & Music Computing
Masters Thesis: Loopable Sequence Models for Live Coding Performance
Developing a transformer model that generates loopable music phrases

2014–2018 **Carnegie Mellon University** — Pittsburgh, PA
Bachelors of Computer Science & Arts in Computer Science & Music Technology
University Honors, Intercollege Honors, Sound Design Minor. *GPA: 3.62/4.0*

honors & awards

2021 **US-UK Fulbright Postgraduate Award**
Grant and stipend to fund postgraduate studies at Queen Mary, University of London

2020 **Bose Key Talent Recognition Award**
Awarded by Bose Health Director for exceptional contribution to the company

2018 **Henry Armero Memorial Award for Inclusive Creativity**
Awarded by Carnegie Mellon faculty for creativity and innovation in computer science

publications & presentations

2022 **London Music Hackspace, "Creative AI for Music Performance and Composition"**
Led workshop teaching composers how RNNs and VAEs can be used for music composition and sound design with minimal coding.

2022 **Patent Pending, "Audio processing using distributed machine learning model"**
Algorithm for distributing audio classification and processing between a wearable and accessory device connected wirelessly. US20220078551A1.

2020 **Patent Pending, "Non-linear breath entrainment"**
Algorithm for modulating an auditory breathing stimulus based on bio-feedback to induce sleep. US20200215383A1.

2019 **Hackaday SuperCon, "Interactive Algorithmic Composition for Human and Machine Musicians"**
30-minute talk on designing intuitive generative music systems for live performances

2017-2018 **Senior Capstone, "Creating with the Machine: Algorithmic Composition for Live Performance"**
Designed and developed three interactive generative music systems using Tensorflow and Max MSP that were premiered in concert by the CMU School of Music.