

# Sara Adkins

## contact

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(443) 824-1238

## web & git

saraadkins.com  
github.com/Satrat

## 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, 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.