Mitchell McDermott

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EDUCATION

Masters of Science in Sound & Music Computing | Queen Mary University of London | London, UK | 2023 | Distinction
- *Thesis: "Unheard Potential: Exploring Haptic-Auditory Feedback in Joint Action Tasks"*

Bachelors of Music in Electronic Production & Design | Berklee College of Music | Boston, MA | 2021 | Magna Cum Laude
- *Thesis: "Morphology Pro: A Four Way Spectral Sample Morphing Audio Plugin"*

EXPERIENCE

Guest Researcher | Human Robotics Group, Imperial College London | London, UK | February 2023 - August 2023
- Aided team research on multisensory feedback in interactive environments, using MATLAB, Simulink, PureData, Python for experiment design and analysis.
- Ran experimental studies with robotic devices, demonstrating enhanced temporal synchronization in joint tasks with binaurally presented auditory cues.
- Demonstrated excellent communication on a multidisciplinary team to explore practical applications in collaborative systems and stroke rehabilitation.

Design Apprentice | Queen Mary University of London | London, UK | March 2023 - April 2023
- Assisted in the development of an accessible digital musical instrument, contributing to key design enhancements under the guidance of a PhD candidate.
- Utilized advanced techniques in laser cutting and woodworking, coupled with precision in assembling electronics, to craft high-quality components.
- Collaborated with the lead designer, gaining insights into professional design processes, effectively addressing technical challenges through creative solutions.

Software Developer | Sonik Architects | Remote | February 2022 - December 2022
- Collaborated closely with electronic music pioneer BT on a cutting-edge initiative to develop a generative real-time audio system for blockchain integration.
- Engaged with team in comprehensive system design and software debugging, focusing on scalability and performance.
- Played a pivotal role in designing and building software instruments and effects using Javascript, TypeScript and Tone.js.

R&D Engineer | Boulanger Labs | Boston, MA | September 2021 - December 2021
- Assisted a team in the integration of real-time reactive sound synthesis engines in immersive VR environments using Csound in Unity.
- Helped develop advanced, malleable Csound instruments and processing units, optimized for real-time manipulation and control within VR settings.
- Engaged in collaborative sound design efforts, working closely with a multidisciplinary team to drive innovation and create engaging VR auditory experiences.

Creative Director and System Developer | MIT Media Lab | Boston, MA | September 2021 - December 2021
- Assisted in designing a real-time audio system with Max/MSP and Arduino, utilizing electromagnetic manipulation of ferrofluid for dynamic sound control.
- Pioneered a system for gestural control of spatial audio, transforming mobile devices into an immersive sound system using Javascript, Node.js, and Max/MSP.
- Demonstrated multifaceted leadership in a collaborative environment, balancing creative direction, technical development, and team coordination, enhancing skills in project management, network engineering, and interdisciplinary collaboration.

PROJECTS

MARBL: A Physical Rotating Sequencer
- Engineered a novel digital musical instrument design, featuring a rotating platform equipped with pressure sensors, LEDs, and a gyroscope.
- Employed C++, Max/MSP, and Arduino to develop an intuitive user interface.
- Applied skills in instrument design, interactive system design, and UI/UX design, showcasing an ability to create user-centric, interactive musical experiences.

Spectral Morphing Pedal
- Developed a guitar pedal prototype designed to blend the guitar's signal with pre-loaded sample loops seamlessly.
- Integrated real-time audio DSP algorithms for monophonic pitch tracking, envelope following, spectral morphing, and compression.
- Utilized C++ and Csound for efficient implementation and demonstrated expertise in embedded system design.

COURSEWORK

Fundamentals of DSP | LTI Systems, Z Transforms, DFT, FFT, Spectrum Analysis, FIR/IIR Filters

Deep Learning for Audio and Music | Python, Pytorch, DNN Training & Engineering

Music and Audio Programming | C++, Digital Signal Processing, Embedded System Design

Interactive Digital Multimedia Techniques | Fabrication, Java, Processing, Pure Data, Arduino, Max/MSP, Analog Circuitry

SKILLS

Programming: C/C++, Python, Git, Java, JavaScript, MATLAB, Max/MSP, Node.js, Processing, PyTorch, Three.js, Tone.js, TypeScript

Soft Skills: Analytical Problem Solving, Creative Thinking, Collaboration Skills, Intellectually Curious, Sense of Humor, Unrelenting Passion

Ethos: Democratize Creativity, Design Accessibly, Develop Bizarre, Craft Extraordinary Musical Experiences