

# Alex Mitchell

## Audio DSP Software Engineer

DSP Software Engineer with 6 years of software development experience with real-time software development and testing. Exceptional experience with implementing audio DSP algorithms, feature extraction, SDK Development, JUCE development, data visualization. Excellent in developing and applying audio algorithms, software development in C++ and Python, as well as the use of audio production software.

### EXPERIENCE Audio Software Engineer

#### **Embodify Co., Los Angeles, CA**

Jan 2024 –  
Present

- Audio DSP, JUCE Development for Pro Audio Products (Spatial Audio Production Suite, Immerse Virtual Studio)
- Wrote and integrated unit tests to test audio plugin DSP functionality using Catch2 and cmake
- Integrated 3rd party head tracking files and panner code into Immerse Virtual Studio for headset use
- Added audio assets into codebase to render four virtual studio rooms, to include impulse responses of speaker and room EQs
- Added timer to track time usage of IVS audio plugin
- Added functionality for backwards compatibility

#### **Madison Square Garden – Sphere Ent, Los Angeles, CA**

April 2021 –  
July 2023

- Researched and developed audio algorithms for use in novel speaker systems, applied these algorithms to MSG audio applications in real-time. This enabled post-production operations for Opening Day shows, including U2:UV Achtung Baby Live
- Led the development and deployment of a spatial audio plugin (VST3/AU), for monitoring of multi-channel audio content in various meter types.
- Implemented a spatial audio framework with MSG speaker configurations, creating binauralizer and auralizer modules
- Instructed other engineers on how to understand JUCE and C++ SDK code, audio programming, DSP concepts.
- Amended existing surround monitoring codebase (EAR) to create 6 spatial audio monitoring plugins with MSG internal speaker configurations
- Backend programming in JUCE C++ apps, to receive control data from other apps on the network
- Created a multi-channel spectrogram viewer for audio engineers to analyze data on set, in preparation for Open.
- Wrote test code for signal processing SDK modules
- Worked with various teams (Capture, Editorial IO, Post Production) to receive feedback and iterate on further versions.

#### **Founder/CEO**

#### **Nautilus Audio, Los Angeles, CA**

April 2022 –  
Present

- Design virtual software instruments and audio units for audio production tools, Implemented graphics and UI/UX programming
- Developed algorithms for non-linear processing (distortion, saturation)
- Wrote and integrated unit tests to test plugin and DSP functionality using Catch2 and cmake
- Created installer packages for to integrate VST/AU plugins into Mac and PC systems
- Released [Crook](#), a saturation plugin in VST3/AU on an online platform

Los Angeles, CA  
(210) 251-1477  
alexsmitchell13@gmail.com

### SKILLS

#### **Software:**

JUCE, Xcode, Visual Studio, Eclipse, Jira, Pycharm, Logic Pro X, Ableton Live, Reaper, FL Studio, Pro Tools, cmake, SAF, EAR, librosa, numPy, sciPy, Matlab

#### **Languages:**

C, C++, Python, Csound, JavaScript, Bash, Git

#### **General:**

MS Office, iWork, Data Visualization, Audio Editing, Signal Processing, Audio Algorithms, Spatial Audio, Unit Testing, Synthesis, Sound Design, Jira, Confluence, and Agile/SCRUM workflow

#### **Operating Systems:**

Windows, MacOS

# Alex Mitchell

## Audio DSP Software Engineer

July 2020 –  
April 2021

### Audio Software Engineer

*Modulate Inc., Boston, MA*

- Utilized signal processing algorithms in C++ and Python to preserve and enhance the audio fidelity of application audio, such as Fourier Transforms, resampling (rate conversion), feature extraction, filtering, circular buffering
- Wrote and maintained audio plugins for use as internal tools. Implemented spectral noise reduction as a processor in VoiceSkins and ToxMod apps.
- Prepared large audio datasets for neural network input, which involved feature extraction and training.
- Researched and implemented best methods of noise reduction and removal. Wrote python scripts to prototype C++ applications in JUCE using libraries such as numPy, sciPy, and librosa.
- Used audio production tools such as FL Studio, Reaper and RX7 for automated processing of datasets, prototyping of FX chains, and audio plugin testing.
- Implemented internal Modulate libraries and tools into JUCE processor for communication between modules, network upload.

April 2019 –  
Dec 2019

### Automation Engineer

*Universal Audio, Scotts Valley, CA*

- Wrote and tracked bugs and issues, referenced and updated documentation.
- Created, executed and maintained automated test scripts for Apollo x4 and Apollo Twin X devices.
- Optimized UAD2 test codebase by as much as 34%.
- Architected framework for plugin regression tests and integrated in into CI/CD build
- Accumulated experience with plugin regression testing, front end testing and integration testing on MacOS and Windows systems.
- Used Python and Pytest automation framework to write, debug and troubleshoot test scripts.
- Utilized foundation of real-time audio principles, sample rates, buffering, drivers, digital and analog i/o types, to test integration of various software and hardware configs.

## EDUCATION

August 2018

### Electronic Production & Design, B.M.

*Berklee College of Music, Boston MA*

#### Courses:

Audio Programming in C, Audio Technology I & II, cSound: Sound Design & Composition, Audio Programming for the iPad, and DSP for Post-Production.

September 2024

### Digital Signal Processing Extended Studies Program

*UC San Diego, San Diego, CA*

#### Courses:

Signals and Systems, Digital Signal Processing, DSP in Wireless Communications, Applied DSP

Los Angeles, CA  
(210) 251-1477  
alexsmitchell13@gmail.com

## SKILLS

### Software:

JUCE, Xcode, Visual Studio, Eclipse, Jira, Pycharm, Logic Pro X, Ableton Live, Reaper, FL Studio, Pro Tools, cmake, SAF, EAR, librosa, numPy, sciPy, Matlab

### Languages:

C, C++, Python, Csound, JavaScript, Bash, Git

### General:

MS Office, iWork, Data Visualization, Audio Editing, Signal Processing, Audio Algorithms, Spatial Audio, Unit Testing, Synthesis, Sound Design, Jira, Confluence, and Agile/SCRUM workflow

### Operating Systems:

Windows, MacOS