

## **Verbal Description**

WaveX is a VST (Virtual Studio Technology), or software synthesizer, comparable to other popular software synthesizers such as Serum or Omnisphere, although not as fully featured. WaveX can be used either in standalone mode on Windows or MacOS, or as a plugin within any popular DAW such as Ableton Live or FL Studio.

At its core, WaveX can take MIDI (Musical Instrument Digital Interface) notes as input and generate sound waves, producing musical tones. WaveX features several controls to sculpt the waveforms and create a wide variety of sounds. WaveX begins with 2 basic oscillators which can generate sine, saw, or square waves. This raw sound can then be processed by other modules in the signal chain including an ADSR (Attack Decay Sustain Release) envelope, a filter, an LFO (Low Frequency Oscillator) and effects such as reverb and delay. The ADSR envelope controls the volume of the sound over time. The filter allows removing specific frequencies which shape the character of the sound. The LFO allows for modulation of any other parameter in the VST. Furthermore, WaveX will feature a preset browser which allows saving and recalling of patches created for the synth. Finally WaveX will have a clean and modern GUI which ensures ease of use for the end user. The end user of WaveX is any music producer or sound designer using a DAW (Digital Audio Workstation) for their work. WaveX will be in the standard VST format which is compatible with all major DAWs for Windows and Mac.

## **Justification**

I have chosen this project due to my background as a music producer. I use VSTs very often and have a deep knowledge and understanding of how they work from a user's perspective. I also have a basic knowledge of C++ from prior classes such as Language and Automata. The framework I will be using for developing WaveX, JUCE, uses C++. This will allow me to extend my C++ skills and use them in a new context I have never tried before. I have chosen a list of features for WaveX that I believe will make it a functional synth, but not too challenging to complete within one semester. I am very interested in this project and learning about digital signal processing.