

ENG 6 FQ 2023 Final Project Proposal

Group Members: Cara Razma (A07), Jasleen Toor (A06), Toby Morrissey (A01)

Project Choice: Audio Sampler

General Description:

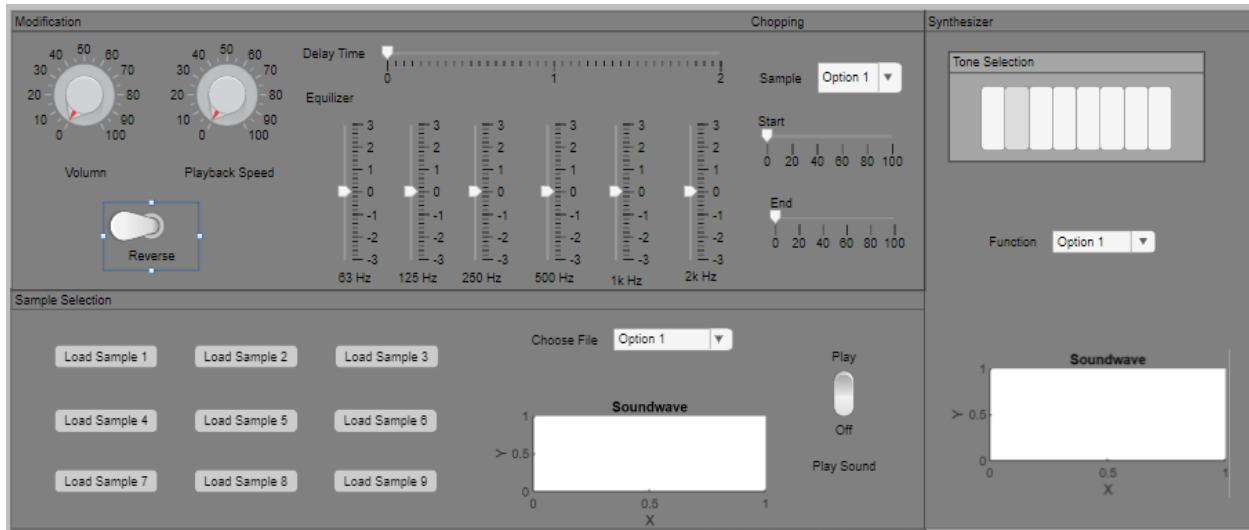
For our final project, we chose to do an audio sampler. The user will import up to nine audio files into a grid layout and then have the ability to alter and play those files. There will be buttons to choose the samples as well as a pause and play button. There will also be a waveform display to view the amplitude and wavelength of the sound. The user will be able to edit the audio through a volume slider, a switch to reverse the audio, a slider to alter the speed of the audio, a slider to delay the audio, and an equalizer slider (adjust the volume of different frequency bands). The user will be able to chop certain segments of the audio to edit. It will also be possible to generate a pure tone by selecting the frequency and a waveform, as well as two mathematical functions they can use. If the user makes an error, a window will pop up and alert them.

Implementation/Key Features:

To create this project's GUI, we will use Matlab's app designer. We intend to use the commands to write to and read audio files in order to import sound effects for further editing. Users will be able to edit their sound files using switches and buttons whose callback functions can alter the associated sound arrays for the files. We'll use the plotting feature to create our waveform display. The list below displays all the edits we tentatively plan to allow for the audio files, along with an option to generate a pure tone via preset mathematical functions.

- Import file (button)
- Play/pause sample (button)
- Waveform display (axis)
- Select sample (button grid x9)
- Trim audio (sliders)
- Edit audio
 - Volume (knob)
 - Reverse (switch)
 - Speed (knob)
 - Delay (slider)
 - Equalizer (sliders)
- Generate pure tone
 - Select frequency (buttons)
 - Select waveform (menu)

Core GUI:

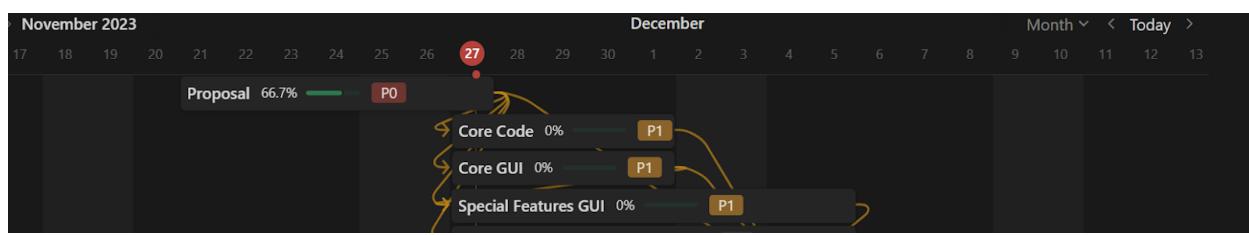


Reach Features:

We have five possible reach features with varying probabilities of implementation. The feature we are most certain about is designing our GUI based on a real mixing board. This could include more realistic sliders, buttons, switches, displays/readouts, organization, and a power button (see reference images below). The second most likely feature is an option for a user to input text and have the app play the corresponding Morse code tones. Additionally, we will look into adding a soundboard that could play sounds over an audio file. Some possibilities include a clap, a hi-hat, and a cymbal. We are also considering creating a piano keyboard with different effects (classical, synth, etc) to play notes with. Lastly, we are considering an additional feature of our realistic GUI called “Vegas mode”. This is a fun option that exists on some real mixing boards that allows them to showcase their full range of capabilities including coordinated slider movement, flashing lights, and color changes (see [link](#) for example). We probably will not end up implementing this, but we think it could provide an interesting challenge.



Team Responsibilities/Timeline:



The screenshot displays a project management application with three main sections: **Proposal**, **Core GUI**, and **Core Code**.

- Proposal:** Contains tasks: Gantt Chart (Done), Github Setup (Done), and Basic GUI Layout (In progress). Assigned to Toby Morrissey.
- Core GUI:** Contains tasks: Pure Tone Display (Not started), Pure Tone Frequency (Not started), Equalizer (Not started), and Delay (Not started). Assigned to Cara Razma.
- Core Code:** Contains tasks: Speed, Reverse, Volume, Audio Trimming, Sample Grid, Waveform Display, Play/Pause, and Import File. All tasks are Not started. Assigned to Jasleen Toor.

Special Features Code section:

Aa Name	Status	Assigned
Morse Code	In progress	Toby Morrissey

Above is a visual depiction of our division of project responsibilities. Our current plan is for Cara to oversee the creation of the basic GUI, implement the reach feature that involves making the GUI look more realistic, and implement the creation of the pure tone feature. Jasleen will implement the program's ability to import and save audio files to a preset sample grid, play/pause/trim said samples, and generate the associated waveform displays for edited sounds. Toby will focus on implementing the major editing options we plan to have, namely adjusting speed, direction, volume, and equalizing; and will work on the Morse code reach feature. Note that these assignments are not set in stone; if a group member finds themselves stuck while working on a task, others will help them resolve issues. The timeline at the very top of this section groups our tasks by priority (P0 being the highest) and the date by which we intend to have them completed.