Simulator User Manual

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Overview

The project centers around the schedule which the user puts in and then is read out loud via text-to-speech. After a schedule is made, the user must put a time for the exercises that will be consistent through the entire schedule. So if the user sets a time of 30, then the schedule will start reading starting at the first exercise then it will move onto the next one ever 30 seconds. During this, a sine wave will play that will signify the user's breathing. The louder the sound is, or the gain level, then the worse the user's breathing form is on that exercise. This value will be based on data identifies from low, medium, and high which alter the gain levels. The higher pitch, or the higher frequency, will signify the higher of the user's breath loudness. These values are all taken from a sample JSON file that is provided, and a JSON file will be needed in order for this to work, as well as to sonify the wave that will represent the user's breathing data. This is the basic functionality of the program and the other controls are used to view the data ranges and accessibility for controlling the audio output.

Buttons

Start - This will start the current reading of the schedule as well as the playing of the audio wave that will be based off of JSON data. Pressing it after it has started will have no effect. In order for this button to work, the timer text box must have a number in it which will set the timer that will be used for each exercise iteration. The schedule will start and a text-to-speech voice should say the first exercise that has been input into the box. If no exercises have been input, then it will not work. The JSON data stream wave will play shortly after.

High Form - This button will override the current JSON data that affects the gain or loudness. It will then change it to a low gain level that coincides with the “high” form factor data attribute. This means that the wave being played will be quieter much like it would be if the current JSON object was set to a high form factor. Nothing else is impacted. Pressing this again will return it to the normal JSON data stream wave. If this is pressed while another form button is active, that one will be stopped and this form will instead be chosen.

Medium Form - This button will override the current JSON data that affects the gain or loudness. It will then change it to a medium gain level that coincides with the “med” form factor data attribute. This means that the wave being played will be at average levels much like it would be if the current JSON object was set to a med form factor. Nothing else is impacted. Pressing this again will return it to the normal JSON data stream wave. If this is pressed while another form button is active, that one will be stopped and this form will instead be chosen.

Low Form - This button will override the current JSON data that affects the gain or loudness. It will then change it to a high gain level that coincides with the “low” form factor data attribute. This means that the wave being played will be loud, much like it would be if the current JSON object was set to a low form factor. Nothing else is impacted. Pressing this again will return it to the normal JSON data stream wave. If this is pressed while another form button is active, that one will be stopped and this form will instead be chosen.

Frequency Override - This will override the JSON data that controls frequency, and instead base the frequency on whatever the value is in the Breathing Loudness Level slider is. It interrupts the JSON data stream to let the user control what the exact data point that controls frequency is at the current time. Pressing this again will return the data to the normal JSON data stream.

Mute - This button will mute the waveform. Pressing it again will unmute it. This does not affect any of the data, and instead it just changes whether the wave is currently audible or not.

Input - This button, when clicked, will take the current data in the text box and insert it into the next free exercise slot in the exercise schedule. It will also clear the text box next to it. Pressing this button after all ten exercise slots are filled up will have no effect. This function can be used to add exercises after the schedule has started reading.

Sliders

Base Frequency - This sets the base frequency for the wave that will be sonifying the breathing data. This does not affect the data stream itself, but it does change the base frequency that the JSON data will alter.

Base Gain - This sets the gain, or the loudness of the wave that will be sonifying the breathing data. This does not affect the JSON data stream, rather it will just make the wave louder while keeping the changes that are made to gain from the JSON data the same.

Breathing Loudness Level - If the frequency override has been pressed and is active, this will override the JSON data to let the user control the frequency of the wave, which is based on the loudness data from the JSON file. Whatever the slider is set to, will be what the frequency of the wave is based off of, so if the slider is set to 1 and it is active, then the wave will have a frequency that it would have if the loudness value in the JSON file were at 1.

Text Boxes

Type Exercises for List Here - This text box will be the input for the exercise name. Whatever is in this text box will be put into the next available exercise slot when the input button is pressed. This will be cleared when that button is pressed. As an example, if the list below it says exercise 1, then there is no exercise in the first slot so inputting text and pressing input will put the text in the text box into the exercise 1 slot.

Timer - This text box only should take numbers. Putting in anything other than numbers will make it invalid and the program won't start the schedule reading. This box will hold ther timer for each exercise. That is, if 60 is input, then every exercise on the list will take 60 seconds in order to iterate onto the next one. This should only be filled out when every desired exercise is on the list, and when a value is set, and the start button is pressed, then there is no way of changing the timer.

Other UI Elements

Remaining Time - This shows the remaining time until the next iteration in the list, which is based off of the value that was input in the timer text box.

Exercise List - This holds the exercise list that will be read to the user. Each slot will have Exercose X in it initially, but it will be replaced, in order, by the user's input exercises. The next exercise that will be input will be the first one on the list that has the form Exercise X, where X is a number from 1 to 10. There can only be 10 exercises total, and anything not on the list will nto be read.