

Phonetics Visualizer User Documentation

Application Overview

The Phonetics Visualizer is an interactive application designed for visualizing and comparing phonetic audio samples. It allows users to upload and analyze audio waveforms and spectrograms, comparing their pronunciation to that of fluent speakers. This tool is especially useful for language learners aiming to enhance their phonetic accuracy.

Installation

Before installing the application, ensure you have the following tools installed:

- **XCode**
- **Qt**
- **Qt Creator**

For detailed installation guides, refer to the official documentation of these tools.

1. **Clone the Repository:**

```
git clone https://github.com/jorredahl/LinguisticCS.git
```

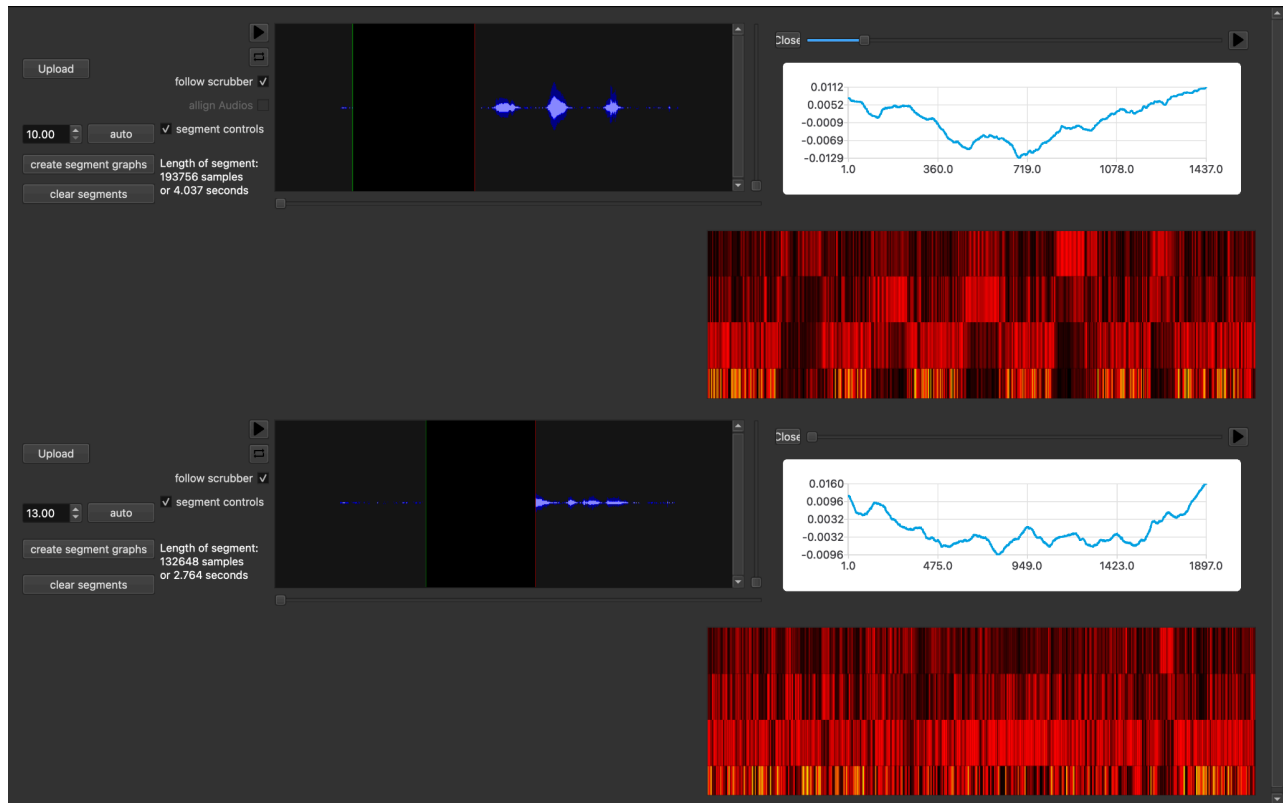
2. **Install FFTW:** Use Homebrew (or an alternative package manager) to install FFTW:

```
brew install fftw
```

Then, copy the FFTW library files to the location required by the project:

```
sudo cp /opt/homebrew/Cellar/fftw/3.x.x/lib/* /usr/local/lib/
```


Refer to the FFTW [official website](#) for additional information.




How to Use

The interface is divided into **two audio sections** (top and bottom), each with identical functionality.

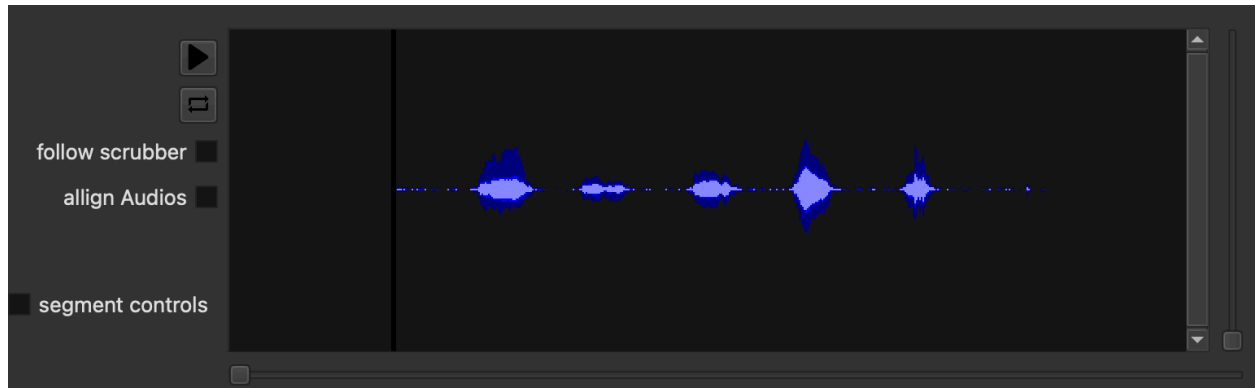
Uploading Audio

1. Click the **Upload** button 
2. Select the desired audio file from your system.
3. Once uploaded, the waveform and spectrogram of the audio will appear.

Waveform Functions

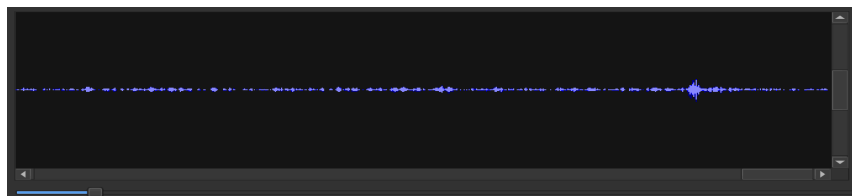
- **Play Audio:** Use the Play button to listen to the uploaded audio 
 - **Keyboard Shortcuts:**
 - Press **Spacebar** to play the top audio.
 - Press **Shift + Spacebar** to play the bottom audio.
- **Pause Audio:** Pause playback by clicking the Play button again.

- **Loop Audio:** Enable looped playback by clicking the **Loop** button.

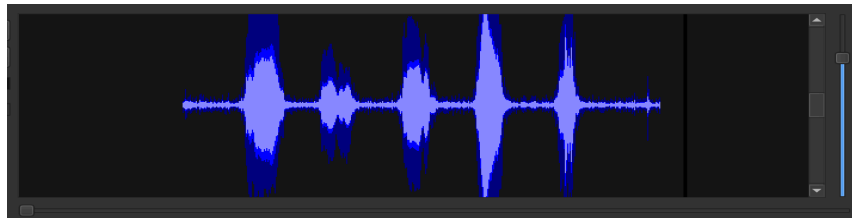


Zooming

- Use the **Horizontal Slider** (below the waveform) to zoom in/out horizontally.



- Use the **Vertical Slider** (on the right side of the waveform) to zoom in/out vertically.



Follow Scrubber Functionality

When the **Follow Scrubber** ☒ checkbox is selected, the playback dynamically adapts to the zoomed-in view. If you have zoomed in horizontally or vertically and press Play, the audio playback will show the zoomed-in waveform. The display will scroll from right to left, allowing you to closely observe detailed changes in the waveform as the audio progresses. This feature helps users focus on fine-grained details of the audio sample during playback.

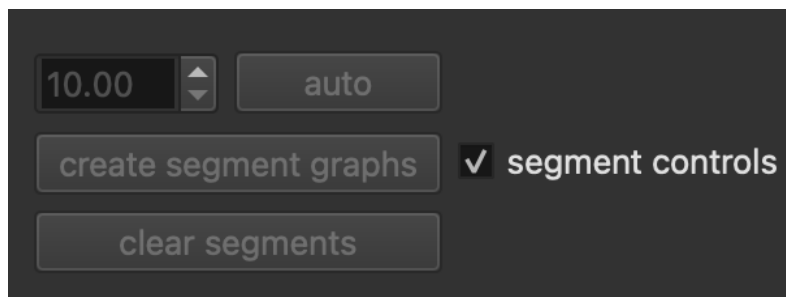
Comparing Audio

- Click the **Align Audios** button to play both audio samples simultaneously.

align Audios ✓

- To play from the same spot, click the where you want to play from on the first chart and the second will play from there, moving its scrubber.
- To play from two separate parts, click the first audio to decide the first audio's play position, then click on the second audio to change its scrubber position.

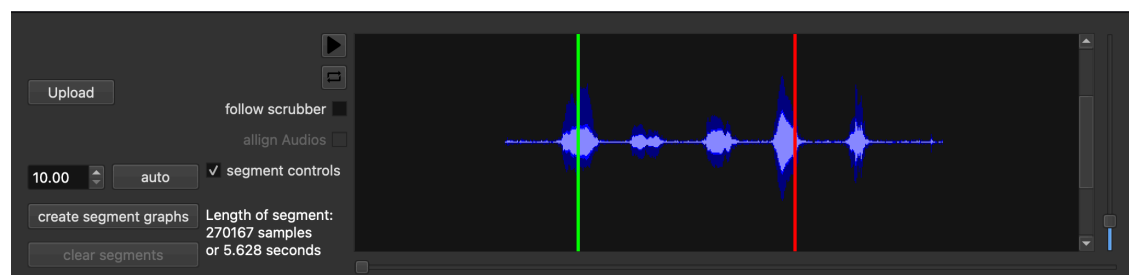
Segment Viewing Functions



Selecting Segments

- Enable **Segment Controls** by selecting the checkbox (Figure 3).
- Click on the waveform to select a start point (green line) and an endpoint (red line).

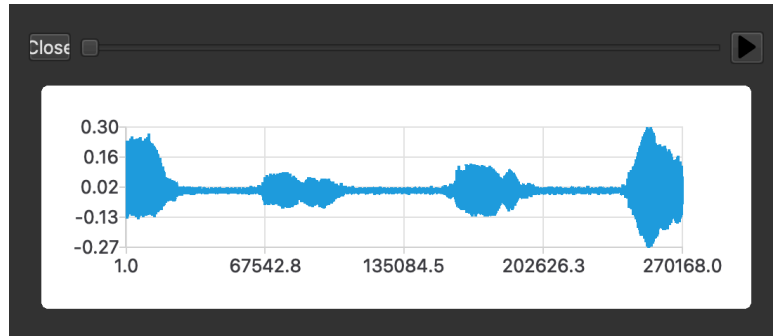
○ Example:



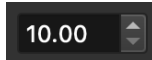
Viewing Segment Data

- Once a segment is selected:
 - Press the **create segments graphs** button to display segment graphs on the right side of the waveform.

create segment graphs



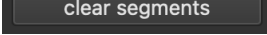
-
- To create multiple segments within a selected range
 - Use the **Segment Division Tool** to specify the number of subdivisions (default is 10).



Exploring Segment Data

- Use the **Segment Slider** to navigate through segment data.
- Close the segment data area by clicking the **Close** button.

Clearing Segments

- Click the **Clear Segments**  button to reset and select a new segment.

Known Bugs

1. **Audio Misalignment:** Occasionally, after the first playback, subsequent attempts may cause the top and bottom audio waveforms to become misaligned. Restarting the application or re-uploading the audio files may temporarily resolve the issue.

Troubleshooting

Common Issues

1. **Audio Not Playing:** Ensure the uploaded file format is supported (e.g., .wav,).
2. **FTW Installation Errors:** Double-check the library paths in your .pro file.

Submit an issue on our GitHub repository: [LinguisticCS](#).