



Incorporating Emotion-Dependent Intonation into Augmentative and Alternative Communication

Overview

Augmentative and Alternative Communication (AAC) devices allow people with severe speech problems to express themselves verbally. However, their “voice” lacks intonation. We were challenged to incorporate “tone of voice” into these devices, resulting in a proof of concept product incorporating emotions into a voice generator with a friendly user interface.



Objectives

Our objective was to incorporate “tone of voice” into AAC devices. To accomplish this goal we created a friendly user interface with a text box and emotion buttons that alter the voice frequency, pitch, and volume with our novel backend fourier transform code.

Approach

- We began by researching demographics to determine a target audience
- After targeting individuals who cannot speak but have control of their hands, we decided a simple desktop application was suitable.
- Java and Python were our languages of choice since they are what we were most familiar with, and had capabilities to create simple user interfaces and modulate audio.
- The libraries used in Java were Swing for the UI, and freeTTS for text to speech.
- The only library used in Python was scipy, which was used for modulating the outputted audio files.
- We met weekly with Dr. David McNaughton to go over our progress and go over deliverables.
- We went through multiple prototypes, beginning solely with text highlighting and slowly extended to audio output and modulation.
- Git was used to maintain version control.

Outcomes

Due to this project:

- The disabled community will be able to communicate with emotion.
- A proof of concept for emotions was developed with the major emotions
- Ground was broken on integrating emotion in speech

