Jing Song U65712216

Professor Osama Alshaykh

EC601

Mini Project 3 Report

December 9th, 2019

DSP: Python .wav File Visualization Tools

In this mini project, I chose the topic on Digital Signal processing and I wrote a simple program that transforms a .wav sound file into a waveform.

The .wav file dataset I used is from Kaggle: Environmental Sound Classification 50, and the dataset was initially given to be used on raw audio classification. The dataset is licensed under CC BY-NC-SA 4.0. These 50 .wav files are all at 16KHz and are 3 minutes 20 seconds each. The initial dataset was all in .ogg format and were then transformed into .wav format for the purpose of this Kaggle project.

I have imported several libraries/tools in this program. The "scipy" library is used to process the .wav file, so that each frame of the sound file could be read and processed. The "matplotlib" is imported to plot the waveform. It allows programmers to plot the curve that they are interested in and set the x-axis, y-axis labels and titles.

To run the program, the user could simply type in "python transform.py n", n is an int from between 0 to 49 (inclusive), which allows them to choose the .wav to transform among all 50 .wav files in the audio/ directory. The program will output the waveform in a new window with y-axis being the amplitude of the sound and x-axis being the time. Therefore, the users could visualize the .wav sound file in a waveform, which could be measured and understood in a different way.

The limitation of this simple program is that it only handles 16-bit .wav files and the sound file has to be mono. Thus, there are still a lot of improvements that could be done and many complications that could be added to the program to achieve other goals.