Audio Filter

EE23BTECH11015 - DHANUSH V NAYAK*

.1 The sound file used for this code is obtained from the below link

```
$ wget https://raw.githubusercontent.com/
    dhanushnayakh03/EE1205/Audio_Filter/
    codes/Dhanush-Singing.wav
```

.2 A Python Code is written to achieve Audio Filtering

```
import soundfile as sf
import numpy as np
from scipy import signal
#read .wav file
input_signal,fs = sf.read('Dhanush-Singing.
    wav')

#sampling frequency of Input signal
sampl_freq=fs


#order of the filter
order=4

#cutoff frquency
cutoff_freq=1000.0

#digital frequency
Wn=2*cutoff_freq/sampl_freq

# b and a are numerator and denominator
    polynomials respectively
b, a = signal.butter(order, Wn, 'low')

#filter the input signal with butterworth filter
output_signal = signal.filtfilt(b, a,
    input_signal)


#write the output signal into .wav file
sf.write('Sound_With_ReducedNoise.wav',
    output_signal, fs)
```

.3 The audio file is analyzed using spectrogram using the online platform https://academo.org/demos/spectrum-analyzer.

The darker areas are those where the frequencies have very low intensities, and the orange and yellow areas represent frequencies that have high intensities in the sound.

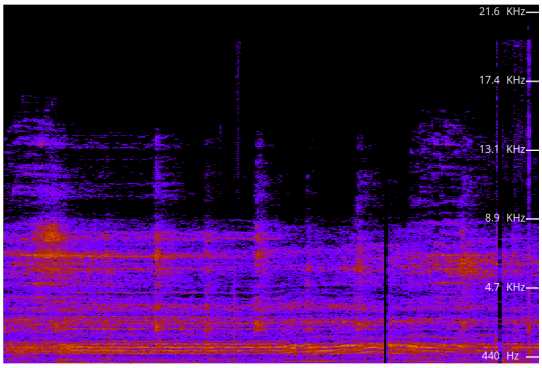

Fig. 1. Spectrogram of the audio file before Filtering

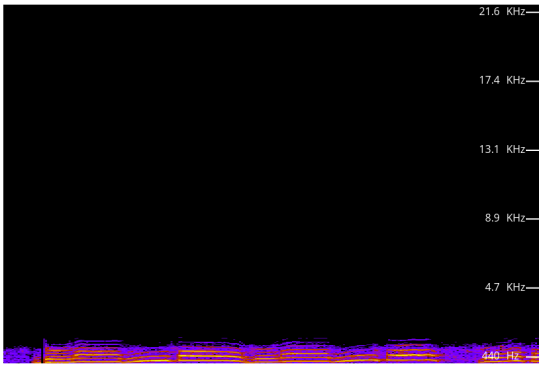

Fig. 2. Spectrogram of the audio file after Filtering , there are no signals above 1KHz