FM

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Contents

1 Project Abstract

Calculation of Bandwidth of Audio Signal

2 Loading the Audio File

We begin by loading the audio file using the wavfile.read() function from the scipy.io.wavfile module. This returns the sampling frequency and the audio data as a numpy array.

3 Computing the Fourier Transform

the Fourier transform of the audio signal using the numpy.fft.fft() function. This transforms the audio data from the time domain to the frequency domain.

4 Calculating the Power Spectral Density

The power spectral density (PSD) is a measure of the power of a signal as a function of frequency. We can calculate the PSD from the Fourier transform by taking the magnitude and squared magnitude of the transform.

5 Finding the Frequency Range with Significant Power

To calculate the bandwidth of the signal, find the range of frequencies with significant power. We can do this by setting a threshold on the PSD and identifying the frequencies that exceed this threshold.set the threshold to 0.1 times the maximum PSD value.

6 Calculating the Band-width

Finally, we calculate the bandwidth as the difference between the maximum and minimum frequencies in the range with significant power.we obtain the bandwidth of the audio as 2 khz

7 code link

Python code to calculate the bandwidth of an audio signal.

https://github.com/imran111888/fwc2/blob/main/FM/code/input.py

just click on input.py

input.py