AUDIO TO SPECTROGRAM

Lily Wang

WHAT IS IT

Signal processing to convert speech to frequency/spectrogram data

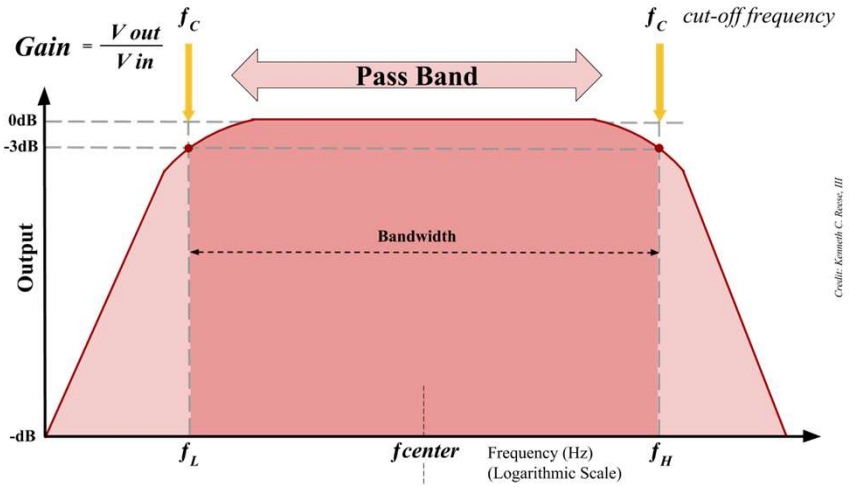
Noise reduction

Using FFT to create spectrogram data

- Phoneme research
- Intermediate results to isolate pure tones
- Machine learning for speech to text

HOW?

Audio signals can be passed through a bandpass filter
White noise can be reduced through signal subtraction



HOW?

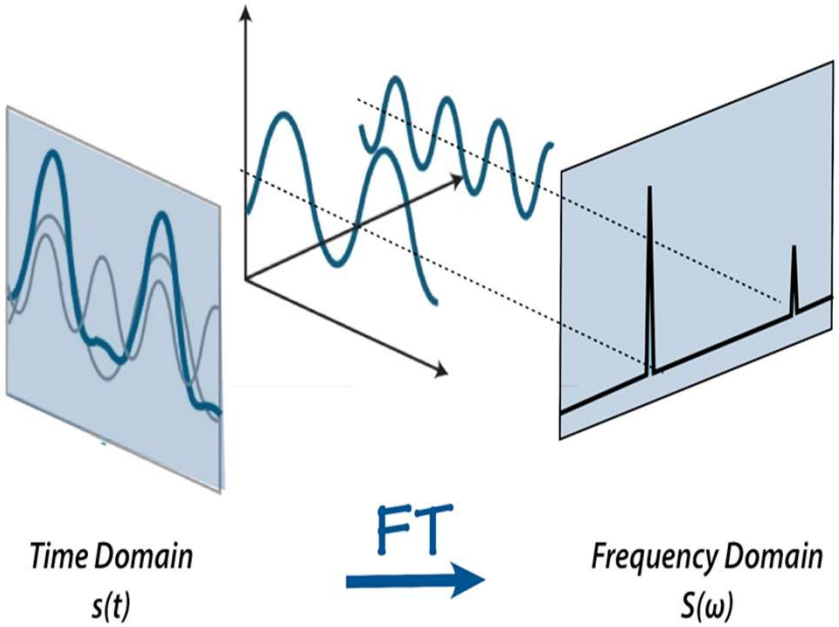
Take audio input in

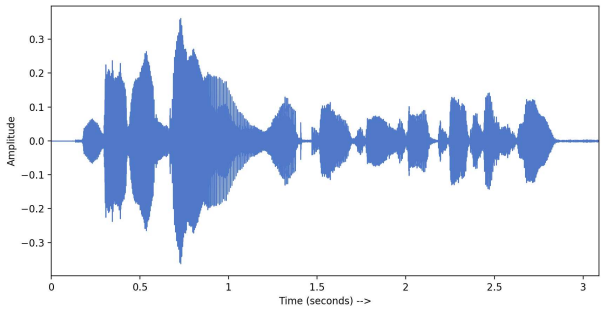
- Time domain

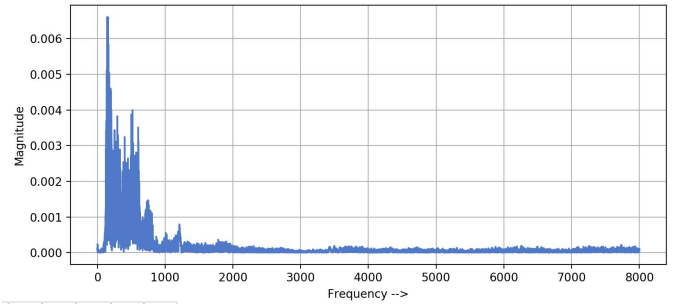
Noise cancelling operations

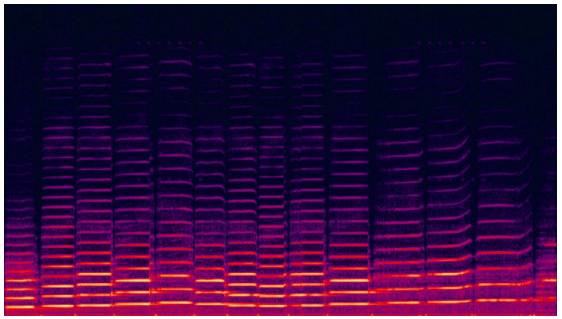
Transform into frequency domain

- FFT









But you lose time information.

- Spectrograms
  - Time Vs Frequency Vs Amplitude

Why not recreate the sound?

INTERMEDIATE GOALS AND EXTENSION

Isolating and identifying pure tones(and harmonics)

Testing various noise suppression techniques

Using machine learning to classify spectrogram images to phonemes for speech to text (pre trained models)

CHALLENGES

Sampling rate – frequency limited to ½ sampling rate

Slice size – 1024-4096