[IIAI30003] Digital Speech Processing

Homework 1

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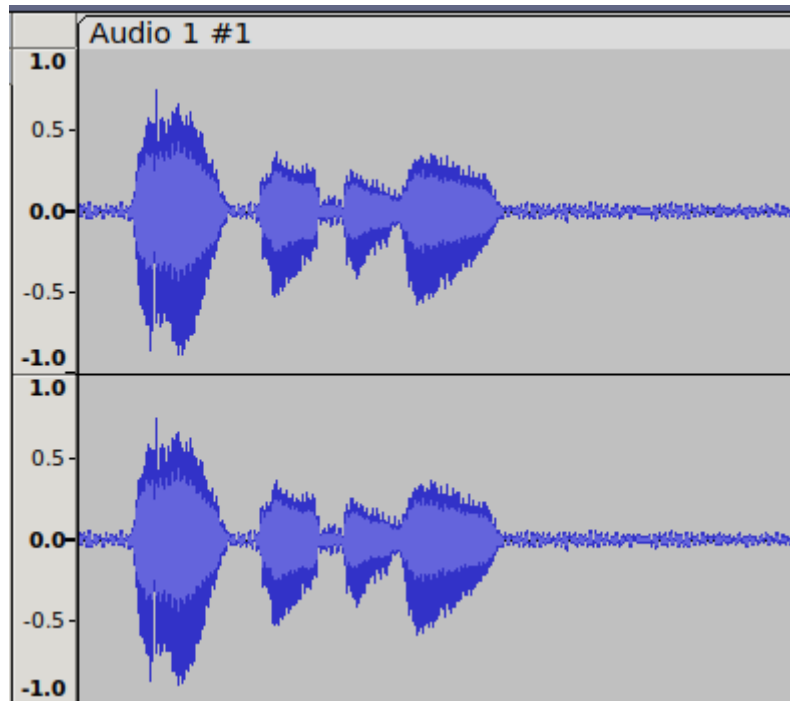
Contents

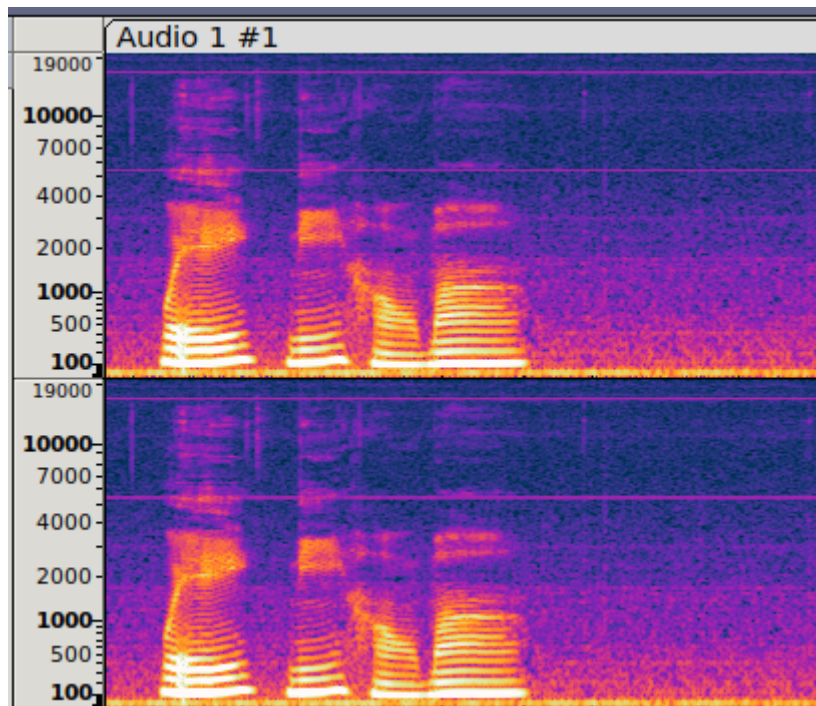# 1 Waveform, Specgram

1.1 Original soundtrack

Figure 1: Waveform

Figure 2: Specgram

1.2 SoX soundtrack

Mixing (Stereo to Mono) → Resampling/16000 Hz
Command: `sox input.wav -c 1 -r 16000 output.wav`

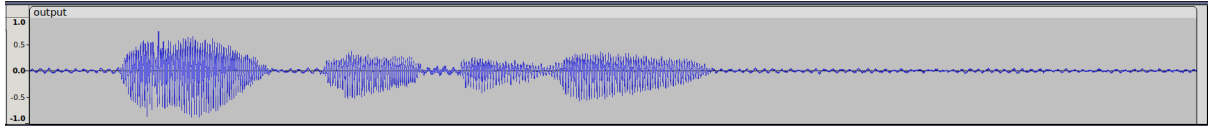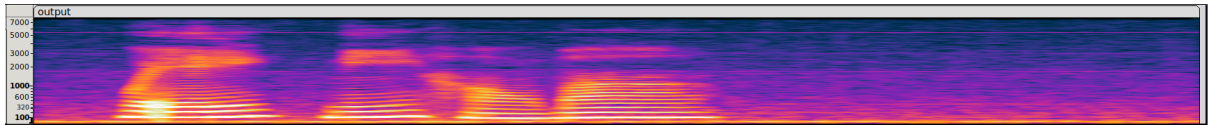Figure 3: Waveform

Figure 4: Specgram

1.3 Rubberband soundtrack

Time Stretching and Pitch shift 5×5
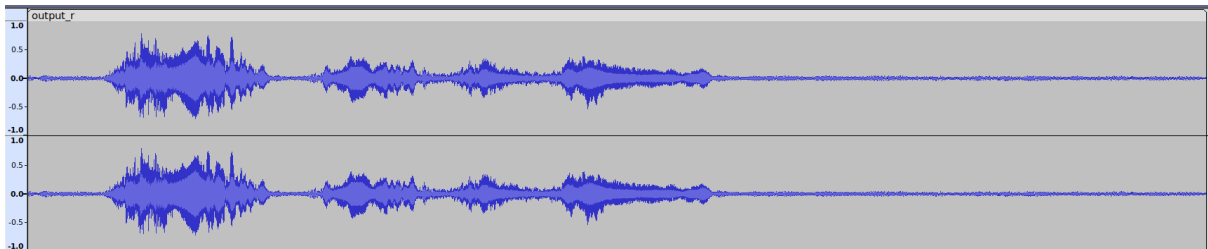Command: `rubberband -t 5 -p 5 input.wav output_r.wav`
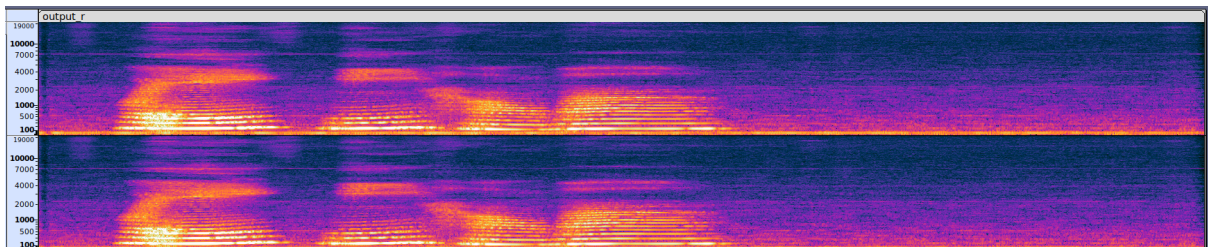

Figure 5: Waveform

Figure 6: Specgram

2 Experimental Results

In the second step, I convert the audio to mono by mixing the left and right channels into a single channel.

And the third step, time-stretching factor of 5, which will make the audio five times longer than the original, also pitch-shifting factor of 5, which will raise the pitch of the audio by five semitones.