ECE-448: Speech Signal Processing -- Monsoon 2018

Assignment 5
DEADLINE: Before 11.59PM on 22st Sep 2018

INSTRUCTIONS:

1. You need to upload a single ZIP file in the moodle. The ZIP file should contain a pdf with your answers which may include screenshots, text etc.

2. At the top-right of the first page of your submission, include the assignment number, your name and roll number.

3. IMPORTANT: Make sure that the assignment that you submit is your own work. Do not copy any part from any source including your friends, seniors or the internet. Any breach of this rule could result in serious actions including an F grade in the course.

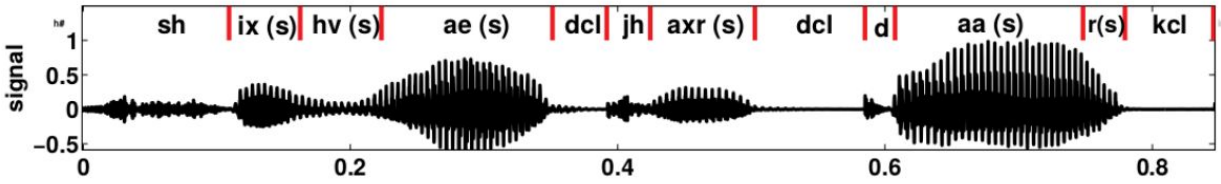
4. Your grade will depend on the correctness of answers. In addition, due consideration will be given to the clarity and details of your answers.

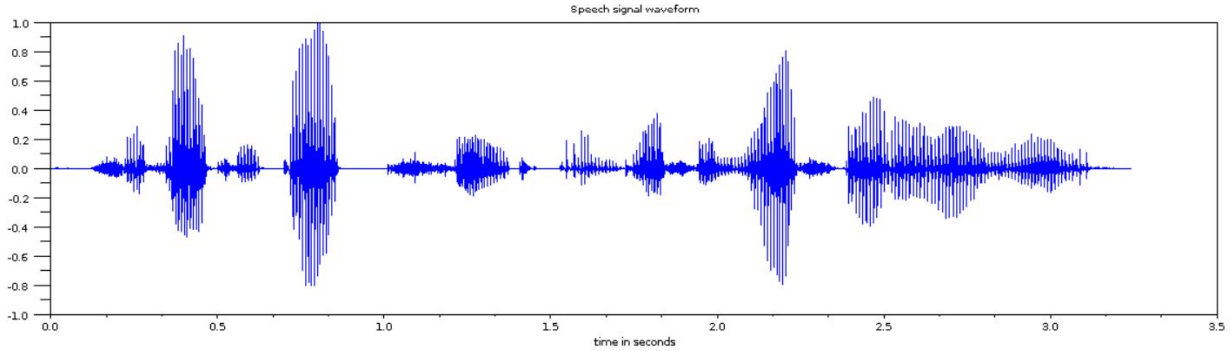
Questions:

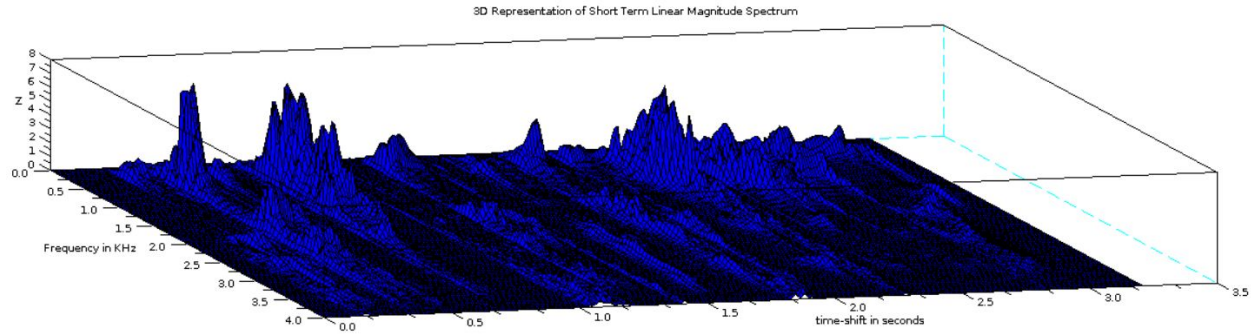
1. Record your name and save it as a wave file. Perform phone level transcription on the wave file. Plot (in a single figure window)

- **i. Speech signal vs time with transcriptions labelled**
- **ii. 3D plot of STFT based Spectrogram**

See below for example







2. Write short notes on effect of

i. no. of points in N-point DTFT

ii. size of window

iii. shape of window (Rectangular, Hamming, Hanning) on STFT magnitude spectrum. Provide illustrative plots (generated using matlab) to support your points.

3. Load a speech signal of your interest and select voiced region then Find the pitch based on the Cepstral analysis? Find pitch using LP analysis? Plot the results (Speech, Cepstrum, Liftered signal; Speech, LP-residual, autocorrelation of LP-residual)

4. i. What is VOP and VEP? How these are useful in speech signal processing?

ii. Write a matlab code to obtain VOP Locations given a speech signal? Plot speech signal, vowel likeliness contour, vop locations ?