Project no. 8 (3 persons)

A HMM-based word recognition system

Perform the following steps;

1. (P1) Implement the read and write operations for a .wav file, acquire different learning samples of 6-10 commands and store it as .wav files. Detect initial segmentation of the signal into phonemes and silence. Present graphic images of the waveform and the 2-D spectrogram.
2. (P2) Perform the Fast Fourier Transform (FFT).
3. (P3) Compute spectral features for short time signal windows, for the whole word training set.
2. (P3) Establish the structure of HMM word models in terms of sub-phoneme categories.
3. (P2) Identify the sub-phoneme classes automatically by a clustering and vector quantization approach, applied to training data.
4. (P1) Establish the probabilities according to the matrices A and B of the HMM. Implement a frame feature classifier.
5. (P1, P2, P3) Implement and test the Viterbi algorithm for word recognition. Prepare a final report.