**Abstract**

Speech is the standard means of communication among people. Automatic Speech Recognition (ASR) applications facilitate the users to interact with machines through speech and perform their tasks effortlessly. Speech Recognition applications in native languages will enable illiterate and semi-illiterate people to use computer services without any/little knowledge to operate computers and to lead better life. In the proposed work, speaker independent isolated- phoneme and word recognition systems have been developed for the Indian regional language Tamil. The Hidden Markov Tool Kit (HTK) was used for developing speaker independent phoneme and word based Tamil speech recognition system. The work involves main tasks like Feature Extraction, Acoustic Model Building and Decoding. Mel-Frequency Cepstral Coefficients (MFCC) is extracted from the speech utterances and Hidden Markov Model (HMM) used to build the acoustic model. In building acoustic model, Multivariate Gaussian Mixture Model with different number of components is used to estimate the state emission probabilities and finally Viterbi Decoder employed to recognize the test speech utterances. A small vocabulary of 50 words which are collected from 10 native speakers of Tamil language was used to build and test the model. The performance of both phoneme and word based models have been analyzed and the recognition accuracy and word error rate of the models are discussed.