**Abstract**

Tamil Language is one of the ancient Dravidian languages spoken in south India. Most of the Indian languages are syllabic in nature and syllables are in the form of Consonant-Vowel (CV) units. In Tamil language, CV pattern occurs in the beginning, middle and end of a word. In this work, CV units formed with Stop Consonant – Short Vowel (SCSV) were considered for classification task. The work carried out in three stages, Vowel Onset Point (VOP) detection, CV segmentation and classification. VOP is an event at which the consonant part ends and vowel part begins. VOPs are identified using linear Prediction residuals which provide significant characteristics of the excitation source. To segment the CV units, fixed length spectral frames before and after VOPs are considered. Both production based features - Linear Predictive Cepstral Coefficients (LPCC) and perception based features - Mel Frequency Cepstral Coefficients (MFCC) are extracted and given as input to the classifiers designed with multilayer perceptron and support vector machine. A speech corpus of 200 Tamil words uttered by 15 native speakers was used, which covers all SCSV units formed with Tamil stop consonants (/k/,/ch/,/d/,/t/,/p/) and short vowels (/a/,/i/, /u/, /e/, /o/). The classifiers are trained and tested for its performance using various measures. The results indicate that the model built with MFCC using support vector machine RBF kernel outperforms.