Thesis Title   Feature Extraction and Data Compression Using Human Auditory System Model and Wavelet for Thai Speech Recognition

Thesis Credits   12

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Abstract

The similar Thai speech (Same vowel and tonal mark like "สี" ("see"), "ฟี" ("fee"), etc) has a bit difference in time domain that is hardly to recognize. This thesis presents the feature extraction and data compression using human auditory system model and wavelet for Thai speech recognition. This method applies the auditory model. It consists of 1. Wavelet transform, transform input signal into three axist (scale, time and amplitude) to extract the sound componant. 2. Sigmoidal of nonlinearity function, this increases dynamic range of sound. 3. Differencial by scale and time, find the sound pattern. 4. Store only the positive extreama value, decrease redundant data by using the symetrical feature of sound. From the benefit of this method, the feature of speech will be extract and amplify. From the experiment result using Backpropagation Neural Network, the recognition rate is 94% (FFT is 71%) for Consonant voice with same Vowel and Tonal mark , 68% (FFT is 70%)for Tonal mark voice and 100% (FFT is 68%) for numeric voice (0-9). Finally, the compression rate is 25-57%.

Keywords   :   Speech Recognition / Feature Extraction / Sigmoid / Human Auditory System Model / Wavelet / Neural Network / Backpropagation Neural Network