Speech Recognition System Based on Wavelet Transform and Artificial Neural Network

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Abstract
For the past several decades, designers have processed speech for a wide variety of applications ranging from mobile communications to automatic reading machines. Speech recognition reduces the overhead caused by alternate communication methods. Speech has not been used much in the field of electronics and computers due to the complexity and variety of speech signals and sounds. However, with modern processes, algorithms, and methods we can process speech signals easily and recognize the text. This paper presents an expert speech recognition system for isolated words based on a developed model of Discrete Wavelet Transform (DWT) and Artificial Neural Network (ANN) techniques to improve the recognition rate. The data set was created by using English digits from zero to five and other nine words (spoken words) which was collected from four individuals in various time intervals. The feature vector was formed by using the parameters extracted by DWT. We have employed Daubechies 4-tap (db4) wavelet for the experiment. The feature vector was produced for all words and formed a training set for classification and recognition. Forty-four features were feed to feed forward backpropagation neural network (FFBPNN) for classification. The performance of the developed system was evaluated by using speech signals. The rate of correct classification was about 98.9% for the sample speech signals.

Keywords: Discrete Wavelet Transform, Speech Recognition, Feature Extraction, Artificial Neural Network.

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References


