

Abstract

This thesis proposes a design of an FPGA-based isolated word recognition system, which consists of three processes: (i) preprocessing (ii) feature extraction using Mel-Frequency Cepstral Coefficients (MFCC) and (iii) pattern recognition using Artificial Neural Networks (ANN). MATLAB computer program is used to create and train the neural networks to obtain the weight and bias. The process of FPGA design uses Xilinx Platform Studio (XPS) to create a MicroBlaze system, which will interface with an Analog to Digital Converter (ADC) module and a flash memory used for storing the weight and bias. Speech samples (1750 samples) recorded from 15 speakers are used. These samples are divided into three sets, the training set (700 samples), the speaker-dependent testing set (700 samples) and the speaker-independent testing set (350 samples). The experiment result shows that the recognition performance of the speaker-dependent testing is about 99.57% while the speaker-independent testing is about 91.99%.