ABSTRACT

A baby's cry is a sign of a baby that shows the feelings and desires of a baby. However, many people misinterpret the baby's cry so that less precise handling happens often. Based on the research from Dunstan Baby Language (DBL), there are 5 types of languages used by infants namely NEH (Hungry), HEH (Discomfort), EAIRH (Lower Wind/Gas), EH (Burp), and OWH (Tired).

This research designed the baby's voice-based speech processing sound identification system. The cry of the baby is recorded by using the audio record feature on the smartphone. The sound signal is then performed extraction feature by using Discrete Wavelet Transform (DWT). The results of the DWT result are pre-processing with DC removal and pre-emphasis stages. Then the sound signal is performed extraction feature by Mel Frequency Cepstral Coefficient (MFCC) and Principal Component Analysis (PCA) methods. The result of the feature extraction will be classified with Euclidean distance to measure the resemblance of the extraction value of each cry by calculating the difference in distance 2 matrices of features. The result of the classification generates the meaning of the baby crying.

The system uses 150 training data and 50 test data. The system can identify the sound of crying babies on 5 conditions of a baby crying, namely Neh (Hungry), Heh (Discomfort), Eairh (Lower Wind/Gas), Eh (Burp), and Owh (Tired). The best parameter is obtained at a frame size of 1024 data per frame, MFCC feature coefficient of 32, DWT at level 1, and DB 2. The system can detect the baby crying sound with the best accuracy of 90% and computing time 0.5542 seconds.

Keywords: *Baby Crying, Dunstan Baby Language, Discrete Wavelet Transform, Mel Frequency Cepstral Coefficient, Principal Componet Analysis, Euclidean Distance*