ABSTRACT

Epilepsy is a neurological condition that affects the central nervous system that causes people to experience seizures and can be detected by electroencephalography (EEG). Epilepsy ranks second from neurological disease after stroke. This disease affects approximately 50 million people worldwide. Therefore, a system was made to analyze epilepsy through one of the events that appeared on the EEG signal, the Complex Partial Seizure (CPSZ) signal.

In this final project a system has been made to detect the Complex Partial Seizure signal in the frontal cortex section of the EEG signal using Discrete Wavelet Transform (DWT) feature extraction because DWT has good multi-resolution capabilities and Support Vector Machine (SVM) classification which has a good classification system and fast computational processes, then compared with the Coarse to Fine Search (CFS) classification method which is capable of working in a variety of objective functions. The results of the feature extraction process with DWT in the form of statistical features will be input into the classification process with SVM and CFS.

The test results show that the highest accuracy obtained is 100% by using a combination of 6 DWT features namely, mean, standard deviation, skewness, variance, kurtosis, and entropy from 40 training data and 40 test data. The best parameters obtained are daubechies 4 (db4) and daubechies 6 (db6) in the classification with 4 constraint functions and 5 number of individuals.

Keywords : Epilepsy, Complex Partial Seizure (CPSZ), Electroencephalography (EEG), Discrete Wavelet Transform (DWT), Support Vector Machine (SVM), Coarse to Fine Search (CFS).