ABSTRACT

Epilepsy is one of disease that attacks nerves in certain parts of the brain, it's characterized by repeated *seizure*s on brain. People who has suffer from epilepsy cannot do normal activities like another. However, if the detection and treatment of epilepsy can be done quickly it will reduce the abnormal level of the disease.

One way to detect a *seizure* in is done by looking at the shape of the recorded signal Electroencephalogram (EEG), the results of the recorded signal will be diagnosed, detected, and tested manually by a neurologist. However, it takes a long time because EEG signals are very irregular. Therefore, many studies have developed a Computer Aided Diagnosis (CAD) system which are expected to helping neurologists detect *seizure*s automatically.

In this study, a CAD system was developed that can assist neurologists in *seizure* detection. In this system there are several stages in processing EEG signals, namely pre-processing, decomposition, feature extraction, and classification. At the pre-processing stage, filtering will be done using Butterworth Bandpass Filter (BPF) to remove some *noise*. Furthermore, the signal that has done the filtering stage is carried out by the windowing stage, i.e. cutting it into the desired section. Next, the EEG signal is decomposed using Empirical Mode Decomposition (EMD). Then the signal will be extracted features using Fractal Analysis which consists of three methods namely Higuchi, Katz, and Sevcik. After extracting, this feature is then classified by the Support Vector Machine (SVM) method. The proposed method is evaluated for its performance, where accuracy becomes the parameter of the proposed system performance. Based on the tests conducted, the highest accuracy results obtained at 94.72% on the CHB07 record. The lowest accuracy is obtained on the CHB06 recording with an accuracy of 63.45%. Meanwhile an average accuracy of 81.02% for all records.

Keyword: *Epilepsy, seizure, EEG signal, WPD, fractal analysis, SVM.*