ABSTRACT

Epilepsy is a condition in which a person unconsciously experiences uncontrolled seizures. This indicates the occurrence of excessive neural activity in the human brain. This disease can affect a person's psychological, cognitive, neurobiological, and social life. This disease has affected ≥50 million people in the world. To treat this disease, surgery is required. And the first step before performing surgery is to detect the part of the brain that is having a seizure and not having a seizure. In this detection step, using the Electroencephalogram (EEG). The signal recorded by the EEG from the part of the brain experiencing seizures is called the focal EEG, and the signal recorded by the EEG from the part of the brain that is not experiencing seizures is called the non-focal EEG.

In this study, a classification of focal and non-focal EEG signals has been carried out by using the variogram as its feature extraction. This study is based on a dataset from the Bern-Barcelona EEG Database. This research was carried out through several stages such as preprocessing using a band pass filter, feature extraction using a variogram, and the classification method using K-Nearest Neighbor.

The results of this study, the system is able to perform feature extraction using the variogram method. From the features that have been successfully extracted, they are used to classify using the K-Nearest Neighbor method. The Cross Validation method is also used to separate training and test data from the available datasets. From the test results, the best accuracy for alpha signals is 80% and beta signals is 90%.

Keywords: *Epilepsy, EEG, Focal dan Non-Focal EEG, Variogram, K-Nearest Neighbour.*