ABSTRACT

Electroencephalogram (EEG) *is a tool to record brain wave activity over a certain period of time which consists of several channels.* EEG *can be used to diagnose epilepsy. Epileptic* EEG *channels can be analyzed by optimizing channel selection on the* EEG *signal, using Spatial Selection* (SS) *and Particle Swarm Optimization* (PSO) *methods.*

In this final project, a system has been created to select epilepsy EEG *channels with and optimize these channels. Before selecting and optimizing the channel, the classification is done using K-Nearest Neighbor* (K-NN) *to get the best K value from the data that is the input to the channel selection and optimization system. The epilepsy* EEG *channel selection uses the Spatial Selection method and the optimization process uses the Particle Swarm Optimization method. From the results of Spatial selection, we get channels which can then be optimized using* PSO *to get the most optimal active channels and increase the accuracy of these channels.*

The test results show that the highest accuracy of EEG *channel optimization after channel selection is 100% using 5 datasets. Each dataset consists of 6 training data (3 infants and 3 adolescents) and 4 test data (2 infants and 2 adolescents). The number of channels obtained also experienced a reduction from the original 23 channels to 7 active channels which were the most optimal.*

Keywords: *EEG, Epilepsi, K-NN, Spatial Selection, PSO.*