ABSTRACT

Motor imagery is a condition in which a person is in a state mentally simulating an action, or in other words, the person already feels that he or she has taken an action but in reality the person has not or cannot perform the action. This is usually experienced by people with motor disabilities or paralysis. To measure the presence of abnormalities or disturbances in motor imagery, you can check the electrical activity of the brain using an electroencephalogram (EEG). EEG will capture a person's electrical activity when the brain receives or responds to a stimulus. Thus the imagery motor activity can be observed.

In this final project, motor imagery classification is carried out to predict a person's motor movements based on EEG signals. The imagery motor that was simulated consisted of two signals including right hand movement and left hand movement. Then the multiscale process is carried out using the Coerse Grained Procedure. The EEG signal was extracted using the Largest Lyapunov Exponent (LLE) method to obtain the feature set in numeric. After that, the signal classification is based on the LLE value using K-Nearest Neighbor (kNN). The classification process uses the cosine similarity method to measure the distance of the closest training data to the object.

From the simulations that have been carried out, the maximum accuracy that can be achieved is 60% using the Euclidean, Cityblock, Minkowski, Chebychev distance calculation methods with odd values of k, namely 1,3,5 and 7. can identify if there are abnormalities of motor nerves, especially parts of the brain.

***Keywords**: Motor Imagery, Electroencephalograph, Lyapunov Exponent, K-Nearest Neighbor.*