ABSTRACT

Motor work systems such as the Brain Computer Interface (BCI) or brain computer interface technology that is capable of translating brain activity displayed by brain waves into commands and messages in terms of classification of Electroencephalograph signals. The purpose of this study is to determine the system model and the best level of accuracy in the classification of the imagination of the movement of the five fingers of the human hand based on the characteristics of the EEG channel. The system design in this study includes a two-dimensional convolutional neural network for classifying EEG signals imagining the movement of human fingers. There are two parts to the system design including the convolution layer and multilayer perceptron which are displayed using the Python 3.8 programming language with the libraries time, pandas, numpy, tensorflow, keras, sklearn, mlxtend, plotting and matplotlib. Four subjects from MI-EEG data with a sampling frequency of 200Hz were used as a design and testing system. By varying the hyper parameter method that will be used in the form of the number of kernels and pooling layers on a two-dimensional convolutional neural network and using k fold cross validation for the training and testing process on EEG signal classification imagination of human finger movements and using a confusion matrix to display accuracy results. The highest accuracy results were obtained by the number of kernels 64 using average pooling and maximum pooling of 46.50%.

***Keywords**: EEG Signal, Motor Imagery, Convolutional Neural Network.*