ABSTRACT

Classification of Electroencephalogram (EEG) signals plays a crucial role in the medical and neurosciences fields, particularly in diagnosing brain diseases, monitoring patient conditions, and therapy development. Classifying EEG signals allows researchers and medical practitioners to gain deeper insights into the human brain's function and activity patterns. By analyzing EEG signals, we can identify patterns associated with normal and abnormal brain conditions, such as sleep disorders or other neurological impairments. The ability to accurately distinguish these patterns is vital for diagnosis, monitoring, and managing brain diseases.

This research utilizes the Support Vector Machine method to classify EEG signals, distinguishing between "normal" and "abnormal" conditions. Data was collected from the PhysioNet database, including normal conditions and specific disorders. Testing was conducted using several brain disorder cases as "abnormal" brain signals, such as insomnia, sleep-disordered breathing, bruxism, and REM behavior disorder, with scaled ratio testing to determine their influence on classification accuracy using Support Vector Machine as the classification method.

The outcome of this Final Project is the capability to differentiate waveform patterns indicating the brain's tendencies in normal or abnormal conditions. The highest classification test result reached 100%, with an average accuracy of 79%, exceeding the expected accuracy of 70%. Other evaluations such as recall, F1-score, and average time are also included. From these results, it can be concluded that the variation in the ratio of training and test data affects classification accuracy. Accuracy rates are higher when the percentage of training data is greater, while accuracy decreases with a decrease in the percentage of training data. Factors such as dataset characteristics, quality, and pre-processing processes also influence accuracy fluctuations.

Keywords: *Electroencephalogram, SVM, classification.*