

ABSTRACT

The increasing need for prosthetic hands for people with disabilities is one reason for innovation in the field of prosthetic hands to create the best prosthetic hand technology. The purpose of this research is to develop prosthetic hand technology, namely the pattern recognition system (Machine Learning). The contribution of this work is able to detect 4 movements at once, namely Hand Close, Flexion, Extension and Relax. The EMG signal is tapped using an EMG OY Motion sensor from DF Robot in which there is a series of EMG instrumentation. Furthermore, the EMG signal analog data is processed through the ADC with the help of IC MCP3008. EMG signal data is processed in Raspberry Pi with feature extraction methods to reduce data and determine the characteristics of each hand movement. Feature extraction used is MAV (Mean Absolute Value), SSI (Sign Slope Integral), VAR (Variance of EMG), and RMS (Root Mean Square). From the results of the 4 extraction processing then the best feature extraction is determined using Scatter and Euclidean Distance for consideration in the next step, Machine Learning. The results that have been carried out on 10 people with each person doing 10 sets of movements (Hand Close, Flexion, Extension, Relax), showing the best Euclidean Distance results is the RMS feature extraction, with a value of 2608.07. This data is then used as a feature extraction consideration in the Machine Learning method. This prosthetic hand is expected to be useful for persons with disabilities to carry out everyday activities easily.

Keywords : *EMG Signals, Feature Extraction, Raspberry Pi*