ABSTACT

Persons with disabilities in Indonesia have reached a fairly high number according to a 2014 Ministry of Health survey. Handling of persons with disabilities is difficult to implement due to quite expensive cost factors and lack of socialization to the community. In this research, a bionic robot arm was designed and created to help people with disabilities, especially those without hands.

The bionic arm adapted to the arm of the person with the disability is driven by signals of muscle contraction. The signal reading for muscle contraction is detected using an electromyogram (EMG). EMG is a testing method used to read the electrical value produced from human muscles through surface type electrodes placed on the skin parallel to the position of the biceps brachii (lifting movement) and trapezius muscle (grasping movements). Muscle signal testing was carried out on variations in the type of electrode, variations in the types of arm movements (lifting and grasping) and variations in measuring objects in the categories of age (adult and elderly) and gender (male and female).

The test results of EMG signal processing show the average multiplication of EMG signal voltage of 965 times, increase in signal strength in the addition of 1 Kg load by 4% in biceps and 12% in shoulder muscles, as well as the addition of 5 Kg can increase signal strength 17% in the biceps and 47% in the scapula. The percentage of success for robotic arm movement in this final project is for the elbow motor of 75% and 65% for the grip motor.

Key Words : Electromyography, EMG, bicep, microcontroller, arm, *bionic*, disbility. trapezius