ABSTRACT

Artificial hand robot is one of robotic application in the medical field. Hand-made robot is used as a device to help people with muscle disabilities in the hand.

In this final project designed an artificial hand robot that works by muscle signals. Electromyogram is used as a sensor to capture the signal generated from muscle movement. Fuzzy logic is used to process data from EMG. The fuzzy method is used because it has adaptive properties and has a high level of accuracy. In the design of the servo motors used as the driving of the robot's hand.

In the end, the data arm strength when gripping and lifting can be used to control the speed and magnitude of the angle servo motors. Results of design almost as expected, but still there is a mismatch in some parts, one of which cut-off frequency shift on LPF and HPF. Frequency cut off for LPF is 500Hz and for HPF is 50Hz. Gain amplifier at EMG circuit is 500 times. ADC values can already be produced around 500-515 when no gripping, 515-550 when gripping, 500-515 when no movement, 515-554 when bring light load, and 554-723 when bring heavy load. Differences movement and strength to produce the ADC value ranges from 500-700. Artificial hand robot can already move with corresponding movement of a hand with acuration 80%.

Keywords : electromyogram, artificial hand robot, fuzzy logic, LPF, HPF, ADC