

ABSTRACT

Wheelchair is one of the medical devices that are used to help patients who have problems in walking, especially for patients who injured, foot defects, impaired motor nerve, and elderly people. Now there are many types of wheelchairs, manual and automatic. With the development of technology, many innovations that can be applied to wheelchair. One of them will made by the author is prototype wheelchair by using electromyograph. Electromyography is a technique used in the medical area to display the signal generated by the motion of muscle activity in humans. Electromyograph using electrodes as a medium to convert signals from the human body into electrical signals.

In this final project, electromyographis used as the input to activate and control the motor on a wheelchair. Not only electromyograph used in this final project, but there is an encoder circuit, voltage regulator circuit, microcontroller, motor driver, and a DC motor. DC motors will be controlled by PID method (Proportional Integral Differential).

Results of the design is almost as expected, but still there is a discrepancy in several parts, one of which on the filter design. There is a shift in the cut-off frequency of HPF and LPF filter. The voltage generated by electromyograph been as expected and it ranged between 0-5 volts so it can be processed by a microcontroller. Age difference produce different amplitude values, if it growing older then the value of amplitude will fizzle out. Design of the encoder and the regulator also is in conformity and running properly on the system. Right and left wheels spins approached when given $K_p = 1.140$, $K_i = 0.585$ and $K_d = 0.555$ for DC motor right and $K_p = 1.227$, $K_i = 0.577$ and $K_d = 0.653$ for DC motor left

Keywords : Electromyograph, Driver motor, DC motor, PID, microcontroller, filter