

ABSTRACT

Bicycle is one of vehicle that commonly use by people nowadays. The sophistication of technology has transform the basic shape and structure of bicycle and also it's functional and ability. Although the technology has affected many aspects of bicycle, there are a lot of technology that has been implemented to other kind of vehicle that has not been implemented to bicycle yet. One of the technology is the automation system. The automation system that can be implemetend to bicycle is the control of bicycle's balance automatically. The self-balancing control of bicycle will be very useful for the development of technology of bicycle.

To build the self-balancing control of bicycle, the bicycle has to detect the tilt of the bicycle itself, which in this research using accelerometer and gyroscope. The value of the bicycle's tilt is used as reference for the movemet angle of steering/handlebar. Furthermore, the mechanical design of this research using a bike frame with some addition parts.

Based on the result of test and analize the system, the best value for each parameter on PID so the bicycle can reach the self-balancing is $K_p = 300$, $K_i = 0$, $K_d = 83$.

Keywords : *bicycle, balancing, automation, control*