ABSTRACT

The development of robots is growing rapidly from year to year. One example is the Segway Personal Transporter. A variety of techniques in the movement of the robot in the dynamic environment became more numerous, including Pole-Placement Controller, Fuzzy Logic, Proportional Integrated Derivative Controller (PID control).

In this final project, FUZZY LOGIC will be used as an inverted pendulum robot controller, because with this control, the level of stability and controllability better. In this system, used two sensors (accelerometer and gyroscope) to obtain data readout is stable and reliable. Then the stable data reading can improve performance to move the position of the robot to be balanced at the point imbangnya.

Analysis will be done is how to balance robot can stand upright at the point balance and accurate sensor readings. Where Fuzzy Logic input parameters of this will have a direct impact on the performance of this control system. From the experimental of Kalman filter, obtained the optimal parameter values of Kalman filter are $Q\_accelerometer = 0.001$; $Q\_gyroscope = 0.003$ and $R\_pengukuran = 0.03$.

Keywords: *Fuzzy Logic, Kalman Filter, Self-balancing Control*