

ABSTRACT

Self-balancing virtual reality robot is a type of robot that uses applications on Android as a means of streaming data from the camera module and as a trigger for camera movement from the servo. The system uses the principle of an inverted pendulum with two wheels. The robot control system made in the CODESYS application (PLC Standard IEC 61131-3 as automation software) installed on the Raspberry Pi 3B+. In this study, the self-balancing virtual reality robot system has successfully realized with a wheel movement control system using the PID control method, using complementary filters, and feedback control using the MPU6050 sensor. The research has already done using the PID parameter $K_p = 151.6$, $K_i = 1263$, and $K_d = 24256$, the system that has designed is successfully balanced and stable at the set point of 0° with the error rate of $\pm 1^\circ$ and the largest overshoot is 10° .

Keywords: Self-Balancing, VR, PID, CODESYS, Inverted Pendulum