

ABSTRACT

Self balancing robot has two wheels on the right and left that will not be balanced if without a controller. This research is used to design a control system that can balance robot self-balancing. This system uses input from the IMU sensor (Inertial Measurement Unit). The output of the sensor is an angle sent to Arduino UNO. The angle that can be compared with the setpoint value is 0 degrees. Difference values from setpoints and system output angles are controlled using the PID control. This control process is programmed in the Arduino IDE software, the results of which are sent to the DC motor to adjust the direction of rotation of the DC motor to balance the body robot. Gyroscope serves to read angular movements, while the accelerometer functions to read the acceleration of objects. The two sensors are integrated in the MPU-6050 module. The robot wheel uses a DC motor and an encoder with a motor driver in the form of Monster Moto Shield. The setpoint is 0° with respect to the normal force of the robot. The motor will rotate when the angle reading is not the same as the setpoint. The motor will do a CW and CCW rotation to achieve stability. The amount of motor speed is given based on the amount of error that occurs between the setpoint and input. The error value can be reduced by the PID controller.

Keywords: *Balancing Robot. Arduino Uno, Gyroscope*





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