DESIGN AND BUILD PROTOTYPE OF BALANCE SYSTEM ON DUMP TRUCK AS A SECURITY SYSTEM TO PREVENT ACCIDENT WHEN DUMPING

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ABSTRACT

Balancing robot is a robot that aims to balance itself on an uneven surface. Without good control the robot will not be balanced. Balancing robots can be implemented in dump trucks as a tool to prevent accidents during dumping. The MPU-6050 sensor is a balance sensor that is able to read the tilt angle. The PID algorithm will assist the system in balancing the robot by controlling the servo motor from a tilted initial position to an upright or balanced position. Without the PID parameter, the system will not run properly. In this study, the Ziegler-Nichols 2 tuning method was used to determine the PID parameter value. However, the resulting parameter has not reached the expected value, then proceed with trial and error tuning. The test results show that the quadruped system using the PID algorithm can increase roll angle stability up to 99.81 % and pitch angle stability up to 99.99 % with values of Kp=3.28, Ki=1.85, Kd=0.75 for roll angle and Kp=7.2, Ki=5.4, Kd=0.55 for pitch angle.

***Keywords** : Balancing robot, Quadruped robot, PID controller, Arduino*