Rancang Bangun Balancing Robot Menggunakan Metode Fuzzy Logic Controller

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ABSTRACT

Fuzzy Logic Controller is a method for controlling a plant to reach the set point desired using fuzzy logic. Self Balancing Robot is one such plant which is suitable using the fuzzy control method. The shape of the robot, similar to an inverted pendulum creates a robot with dynamic stability. Therefore control is needed to respond to keep the robot upright. The input that will be used is error and delta error, with PWM output because it uses a DC motor actuator that can be adjusted with PWM. FLC has many advantages over other methods, such as developing this method that is flexible and straightforward. The FLC uses a degree of truth drawn by a curve and only determines the membership function as a parameter. This method can also solve the problem of inaccurate values. The problem becomes the basis of all plants because the data usually obtained from sensors can cause instability in plants. Therefore, it is used as a complementary filter as a filter for raw data from the MPU-6050. The results showed that the robot still tends to fall forward rather than backward because the PWM response generated is not the same as when the robot tilts backwards. Even though the response is still not stable, the filtering results using a complementary filter are relatively good because the smooth angle reading graph results are not rigid.

Keywords: *Self Balancing Robot, Fuzzy Logic Controller, Complementary Filter, MPU-6050*