

ABSTRACT

In this modern era, the need for electrical energy is very much needed. Electrical energy is needed to charge electronic devices to support daily needs. Electrical energy can be generated from sunlight using solar cells. A composite of solar cells is the main material of solar panels. Solar panels can optimally convert solar energy into electrical energy when the direction of sunlight is perpendicular to the panel. To keep the direction of sunlight always perpendicular to the panel, a solar tracker system will be made.

Solar tracker is a system that can follow the movement of the direction of sunlight so that the solar panel is perpendicular to the sun. The angle of incidence of sunlight will be adjusted and used as a setpoint in the system. The system will move the solar panel using an actuator in the form of a DC motor so that it is in accordance with the angle of incidence of sunlight. However, DC motor as actuators have performance limitations. Therefore, in this system the actuators will be programmed using the fuzzy logic method. Fuzzy logic will be used as a system controller to interpret the weights of the vague performance limit values on the actuators so it can improve system performance. In this final project research, a single axis solar panel angle position control system based on fuzzy logic will be designed.

From the test results, the comparison of angle readings between the MPU6050 sensor and the protractor has an accuracy rate of 97.95%. Fuzzy logic controller can speed up the rise time, settling time, and reduce the steady state error of the system response. The power output of single axis solar panels has a power increase of 10,1% more over the power output of fixed system solar panels (angle of 0° to earth). Single axis solar tracker can produce more power output because the position of the panel is always perpendicular to the sun.

Keyword: Solar Panels, Solar Tracker, Fuzzy Logic Controller.