

ABSTRACT

Lighting is an important component so that humans can work or observe the object they are working on. In this case the source of lighting is a lamp. The working principle of a lamp in a room generally only uses an on-off system, which only pays attention to the dark and bright conditions of a room. Conventional operation can be said to be ineffective due to the inefficient use of electrical energy. The control principle used is fuzzy control.

The application of fuzzy logic in this case uses the Sugeno Method as its inferencing system. The composition of the rules uses the AND and IF-THEN operators, the defuzzification process uses the weighted average method. The control element in this control system is a microcontroller with a setpoint input and a light sensor (LDR). Information from the control will be sent to the actuator, namely the AC Light Dimmer and the plan, namely two incandescent lamps. With the aim that the system can continue to run stably if one of the lights has a problem (fault tolerant), the ideal light intensity of a room is around 120 ~ 250lux. If there is a failure in one of the lamps, there is an alarm indicator from the buzzer.

This system is tested in a prototype test room. This system gets the best performance at the 200 lux point, under these conditions when tested without interference. The resulting system response is 2.81 seconds for rising time, 11.25 seconds to reach steady state, a slip value of 0.65% and steady error of 1.91%. When given a flashlight interference, the accumulated system takes 18.05 seconds to return to steady conditions and the error price is 1.63%, and when one of the lights is disturbed, the accumulation of the system takes 9.18 seconds to return to steady conditions and the error price is 5.58%.

Keyword : *Light intensity, Incandescent Lamps, Fuzzy Logic, Microcontroller, LDR Sensor, Dimmer Module, Buzzer.*