

ABSTRACT

In this study, the author designed a product in the form of an Adaptive Room Light which is intended to make the use of room lights more efficient. This adaptive lamp applies the concept of smart lighting based on the Internet of Things (IoT). This Adaptive Room Light uses a Light Dependent Resistor (LDR) sensor to detect the intensity of light around the room and uses a Passive Infrared Receiver (PIR) sensor to detect movement so that the use of room lights is more efficient. Then the data is processed using the Adaptive Neuro-Fuzzy Inference System (ANFIS) to control the light emitted by the room lights. Then the room lights will turn on based on the light recommendations issued by ANFIS so that the use of room lights is more efficient.

The results obtained that the tool has been designed can function properly in accordance with what is expected. The sensor can detect light and movement well with a maximum distance of 700 cm. The throughput value obtained during the test is 99kbps and is included in the bad category based on ITU-T standardization. Then, the packet loss test on the system designed has a result of 0.46%, which means it falls into the good category based on ITU-T G.1010. The last one is the result of the delay test, the value is 130 ms, which means it is included in the very good category based on ITU-T G.1010 standardization. The comparison of the control methods in this final project is the fuzzy method and the ANFIS method with the Root mean Squared Error (RMSE) value of the ANFIS 0.65654 and the RMSE value of the fuzzy method of 7.847. So, it could be concluded that the ANFIS method is better than the fuzzy method.

Keywords : Internet of Things, Smart Lighting, Adaptive Neuro-Fuzzy Inference System, LDR, PIR