

ABSTRACT

Indonesia is a country with a tropical weather which causes areas with hot weather. One way to regulate temperature is to use a fan to regulate air circulation, thereby making the room temperature cooler. The fan principle works by utilizing an electric motor to convert electrical energy into mechanical energy. This mechanical energy is then used to rotate the fan blades and produce air flow. In general, fan control only uses on/off control, which is controlled using a manual switch or remote control to turn on the fan. This research designs a control system that is able to automatically regulate fan speed based on temperature and number of people, detected by DHT11 and IR sensors by applying IoT-based Fuzzy logic. Fuzzy logic is applied to overcome uncertainty and complexity in decision making based on sensor data. Through the use of Fuzzy logic and IoT technology, the designed automatic fan control system is expected to optimize the comfort of the indoor environment by adjusting the fan speed adaptively based on changing temperature conditions and the number of people. This research will test and analyze system performance based on temperature measurements and the number of people in the room obtained from sensors. The experimental results show that the system can work as expected. The DHT11 sensor is accurate in detecting temperature, with an error value of 3%. The IR sensor can detect the number of people from several experiments that have been carried out. The fan speed will get faster if the temperature gets hot and the number of people increases. It takes more time to get to a normal temperature from a cold temperature compared to a hot temperature.

Keywords: *Fuzzy, DHT11, Internet of Things, ESP32, Fan.*