

## **ABSTRACT**

*Everyone must have many who want a comfortable and safe home when the house is empty for a long time. However, there are still some people who have not anticipated this condition, for example, such as a home security condition if there is a thief entering or the condition of the house lights that are forgotten is switched off while traveling, thus causing losses such as loss of goods and increased electricity use. From the problems that occur, then a smart home system is designed that can control and monitor homes at a distance.*

*This smart home system is designed using several sensors and a control board consisting of a DHT11 sensor as a temperature gauge, MQ-2 gas sensor for detecting gas, PIR sensor for detecting movement, LDR sensor for detecting light, RFID for identifying identity, and STM32F407 as a program controller. The controller board will be made based on the microcontroller which is supported by Real-Time Clock, Wi-Fi module, 8 digital input ports, 8 output ports, and 4 extended module ports. The controller board can be configured using setup software via I2C and SPI communication, while the android application uses a Wi-Fi connection.*

*The use of this system has an easy implementation process for users without the need for complicated installation, so it can be used immediately. The results obtained from this study are that the microcontroller can respond to data requests and can output data accordingly through an I2C connection, Wi-Fi, and can send activity logs to the server with 87.67% data transmission accuracy, so that the smart home design system can meet the needs for the user.*

**Keywords:** *Smart Home System, Controller Board, Wi-Fi Module, Android Application, Setup Software, I2C Communication, SPI*