DESIGN AND CONSTRUCTION OF IOT SYSTEM PROTOTYPE FOR HOME SECURITY WITH ESP-32 MICROCONTROLLER

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ABSTRACT

This study develops a prototype of an Internet of Things (IoT)-based home security system using the ESP-32 microcontroller. This system is designed to allow homeowners to monitor and control home conditions in real time remotely through a special application connected to a smartphone. In this system, various sensors such as gas sensors, temperature sensors, and fingerprint sensors are used to detect conditions inside the house. In addition, this system is equipped with a buzzer as a warning alarm and a solenoid doorlock as a door lock actuator. The system design and implementation process was carried out using the Arduino IDE program for the ESP-32 microcontroller. The test results show that the system is able to provide effective notification and control to improve home security. The use of IoT technology in this system has proven to be efficient and provides practical solutions to home security problems that homeowners often face. System testing showed an error of 3.242% for the temperature sensor, 0.98% for the humidity sensor and other tests including testing the fingerprint sensor, fan system, exhaust, and IoT system which had a 100% success rate.

Keywords*: Internet of Things (IoT), Home Security System, Fingerprint Sensor, Temperature Sensor, Gas Sensor*