

ABSTRACT

The occurrence of fire disasters in the household environment, especially with fire sources originating from electricity or gas cylinders, often occurs due to the negligence of the homeowner, especially when the house is empty and the occupants leave it so that the initial symptoms of the fire are not detected. If these early symptoms can be detected as early as possible, surely big losses can be avoided.

How can the early symptoms of the fire be detected as early as possible, especially when the host is not in the house. In this Final Project a fire symptom detection system is designed and realized using gas sensors, smoke sensors, fire sensors and temperature sensors with a fire symptom notification feature sent via an android application using the MIT App Inventor accompanied by a video monitoring feature via a camera installed in the kitchen of the house. In addition, in the event of a gas leak, the system is also equipped with prevention of gas concentration in the room by automatically opening the air gap accompanied by the operation of an exhaust fan.

Testing is carried out in two aspects, namely the function test and performance test. From the results of the function test for each functional element, as a whole it shows that the system functions 100% as it should (according to plan). In terms of performance testing, a sensor test was carried out in the form of an error rate from the temperature sensor (DHT11) which showed an average of 2.16%, and the sensitivity of the fire sensor which is able to detect fire within a distance of less than 100 cm from the flames. From the results of network performance tests in the form of notification delays to applications for each sensor an average of 4.465 seconds and video quality measurements using the objective method obtained delay: 6.599 ms, 0% packet loss, 6.571 ms jitter and throughput of 803.593 kbit/s with the QoS parameter conversion results to the Evening Mean Opinion (MOS) using the E-Model obtained MOS: 4.426 (which means the excellent category); while the subjective method (questionnaire) obtained a MOS value of 4.039 (very good category).

Keywords: Smart home, home fire prevention, IoT, video monitoring system, android application.