



INTERNET OF THINGS BASED HOME SECURITY SYSTEM

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Abstract

Currently, the crime of robbery and theft in the household is still a lot and disturbing. This is because the unemployment rate continues to increase every year. Unemployment is usually caused because the number of jobs is not proportional to the number of jobs. The house is one of the basic needs in human life. A house must provide a sense of security to its owner. In previous studies, the home security system only used an sms gateway. Therefore, to improve technology, a home security system based on a microcontroller and IoT has been created. The electronic components consist of IR sensors, and other supporting components as a complement. The system will also be equipped with taking pictures as a notification tool to homeowners. The results of this study indicate that the IR sensor function can detect something. Tests prove that messages can be sent when sensors detect something. While the remote system can still work while still connected to the internet.

Keywords— Home Security System, Wemos D1, Microcontroller, IOT, Arduino.

INTRODUCTION

The security system is used to provide protection for an object where an object contains something that is considered very valuable and needs to be given security such as a building, place or something that is considered valuable. Therefore a security system is needed to prevent someone from committing a crime, either theft or a criminal act. Especially in areas that are not handled quickly when an act of crime occurs because it will be detrimental when what is considered valuable is lost.

The system used for this research is a home security system, we all believe that the house is the safest and most comfortable place to store valuable objects. A security system that is made to carry out a supervision of a person in monitoring the movement of people who will enter the house in carrying out a prevention from something that is not desired by the home owner, for example thieves or other criminal acts. It is made using wemos d1 (as an IoT system) [1]. Camera as surveillance media, IR sensor and buzzer as an alarm when someone forces their way into the house or passes through the IR sensor. The advantage of this system is that this system can monitor people who will enter the house or pass sensors installed and can turn on alarms and lights automatically.

While in this study, the security system designed was simpler because it only used Wemos d1 and used SD Card Shield as a medium for receiving data from vc0706 which 96 were stored on the SD card and lights, the buzzer would turn on automatically when someone entered by force.

RESEARCH METHODS

The design of a home security system using the Internet of Things was carried out using a descriptive method, so this research was made because there were several events that made the experience or inspiration in making home security efforts.

To be able to design a home security system based on the Internet of Things by installing a hardware component of a security system. The device that was first designed was the wemos d1, wemos d1 which functions as an IoT system on the device that will be created and responds to an input that has been set in an arduino program so that it can be useful in processing various connected peripherals. the next step is to install the Arduino ide software which functions as a tool in writing the program to be made [2] .

To ensure that everything works well, a system test is carried out using Proteus software where this software can perform simulations so that the system is made according to what has been planned. Here's Figure 1 for an explanation.

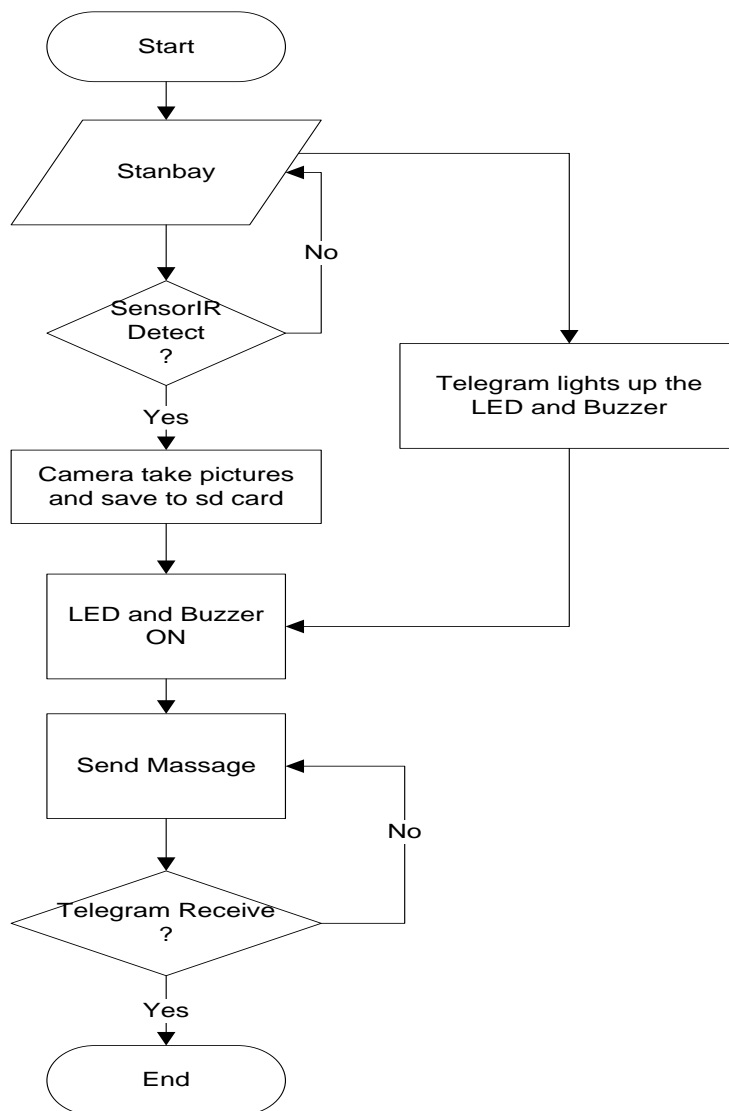


Figure 1. Program Flowchart

The way this system works is when the IR sensor is active, the Buzzer and LED will light up then the camera will take a picture and send a message to the telegram application until it is received by the telegram application. And at the standby position the telegram application can send a message to turn on or turn off the alarm, when the message is received, the program will turn on or turn off the alarm.

RESULTS AND DISCUSSION

The design has been carried out after that a trial of the IoT-based home security system was carried out by observing the IR sensor as well as the process of testing the time of saving images to the SD Card.

In testing this home security automated system, the following steps are required:

1. The condition of the device is in standby.
2. When the IR sensor is in High condition (detects) the buzzer and LED will light up, the program will send a message to Telegram, then the camera will take a picture and save it on the SD Card
3. Buzzer and LED will turn off after the set time is up.

Table 4.1 IR Sensor Test Results

No	Detection Distance	Infrared Condition
1	2 Cm	Active
2	5 Cm	Active
3	7 Cm	Active
4	10 Cm	Active
5	12 Cm	Active
6	15 Cm	Not active

In testing this home security automated system, the following steps are required:

1. The condition of the device is in standby.
2. When the IR sensor is in High condition (detects) the buzzer and LED will light up, the program will send a message to Telegram, then the camera will take a picture and save it on the SD Card
3. Buzzer and LED stay on.

Table 4.2 Image Storage Time Test Results

No	Image Quality	Time
1	640 x 480	26,5 second
2	320 x 240	25,7 second
3	160 x 120	23,5 second

CONCLUSION

After testing and analyzing the results of the home security system, it can be concluded as follows:

1. Detection from the IR sensor at a distance of 2cm – 12cm produces an active condition and at a distance of 15cm produces an inactive condition.
 2. Saving photos from the program to the SD Card takes 25 seconds.
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