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Cost efficient security system Using Internet of Things

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Abstract: *Home Security System is an Arduino based security system that not only protects our homes but also all those place where security is required. For domestic purpose, need of security alarm systems is required. As the number of crimes is increasing every day, there should be something that will keep us safe. We are aware of high end security systems present in all markets, but they are not easily available for everyone. Therefore we want to provide a solution by building a cost-effective electronic system that has the ability to feel the intruder's speed and stop the alarm with the user sending an SMS alert. The basic idea behind this letter is that all bodies produce some heat energy in the form of infrared which is invisible to human eyes. However, it can be detected by electronic motion sensors.*

This research paper includes the use of Arduino, Motion sensor, buzzer, LCD display, SIM800 GSM module and a simple program. The sensor detects any speed in its permissible range and turns on the alarm. It will also send a signal to Arduino which processes the signal and sets an alarm with the detecting message on the display and a SMS is also sent to the user when the motion is detected. With this system we can easily install a security alarm in our home for unwanted intruders.

Keywords: *Arduino, motion sensor, buzzer, LCD display, SIM800*

I. Introduction

Security System research paper is an Adriano based which can secure our not only home but any place where security is needed. This system has lot of implication for today's world and places where security is must. This system detects the motion in front of it and raises the alarm and not only raises the alarm it instantly sends an alert message on the mobile number of its owner. Laser security systems are a high tech technology that used to be a part of home security only available to the wealthy. It is manually switch dependent sensors and a basic alarm unit. Laser security system a person moves in front of the motion sensor, that person's body heat triggers the system's alarm. And the alarm signals the security monitoring company and local law enforcement [2]. The basic alarm unit will also sound a loud alarm. Oath analysis and experiment indicate that rather stringent requirements must be met in order to obtain efficient optical heterodyne detection. There is considerable experimental evidence that these requirements can be met by employing an enclosed transmission path, the so called optical pipeline, and that from a practical standpoint the difficulties are not much greater than for other types of detection. Such a line with servo control of beam position should provide a very satisfactory transmission medium for any type of receiver. The heterodyne receiver appears to be more satisfactory than the direct detector for the reception of phase$ or frequency modulated light or multiplied optical signals. At some wavelengths it may provide the only means of overcoming thermal noise and detection of noise problems. The operation of Doppler radars depends upon the heterodyning process or most applications, supplying a properly tuned local oscillator present no great difficulty [5]. The coherent receiver provides high discrimination against background light. It also provides efficient detection in the infrared region, in which other detectors of these reasons and since free space is an ideal transmission medium, the optical heterodyne receiver may have considerable advantage over others for space communication applications.

II. Methodology

The Figure 1 represents the combined representation of all the modules which are considered in this model for Security System.

Arduino is used as a microcontroller which will control all the sensors connected through it by the code embedded into it. The Arduino is an open source software and hardware development environment that is built around a Chip called ATMEGA G 328P [4].

The sensor detects any motion in its permissible range and triggers the alarm. It will also send the signal to Arduino which processes the signal and set off the alarm along with detection message on display and also a SMS is sent to the user as soon as motion is detected. With this system we can easily set up a security alarm in our home for unwanted intruders [3].

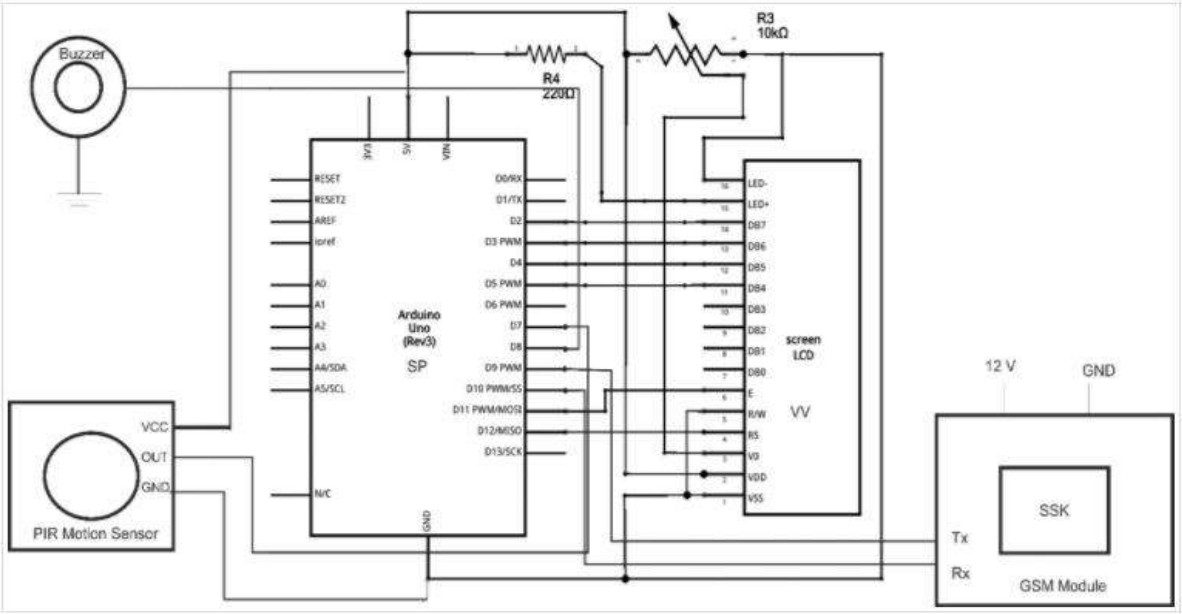

Figure 1: *Block* diagram *of proposed System*

III. Implimentation

Step 1: Connection of P.I.R Sensor to Arduino

The circuit connections are shown in Figure 2:

a. Connect VCC pin of P.I.R sensor positive terminal of Arduino (5V).
b. Connect GND pin of P.I.R sensor to any ground pin of Arduino.
c. Connect out pin of P.I.R of sensor to Pin no. 7 of Arduino.

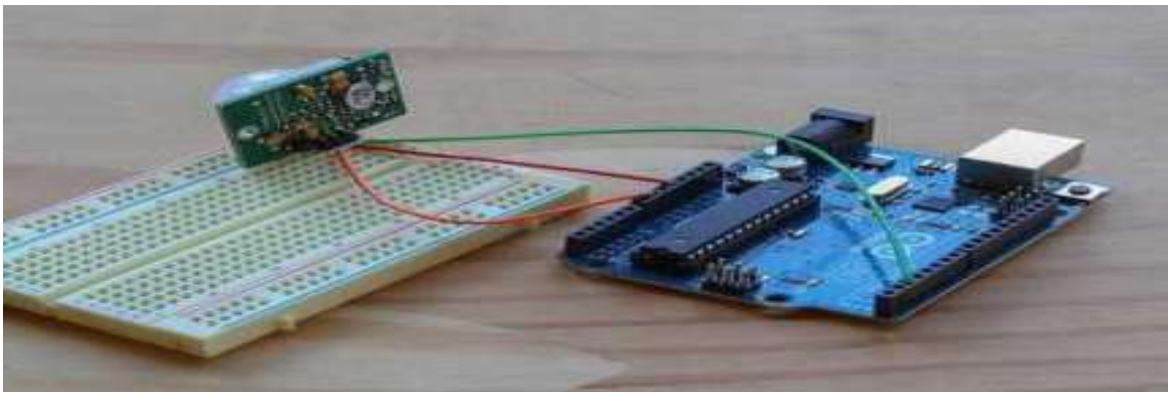

Figure 2: *Connection of Arduino with P.I.R motion sensor*

Step 2: Connection of Led With Arduino

The circuit connections are shown in Figure 3:

a. Connect Positive terminal (Long Head) to the Arduino pin no.13.
b. Connect Negative Terminal (Short Head) to any ground pin.

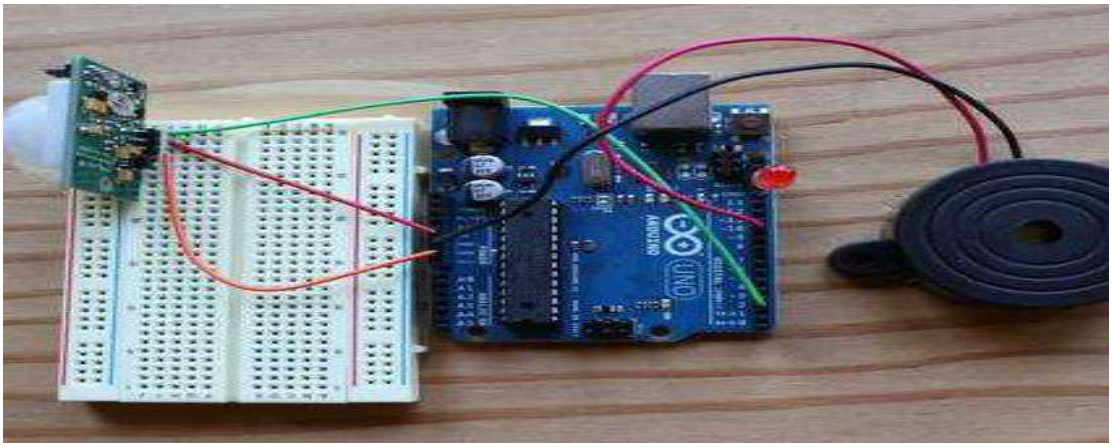

Figure 3: *Connection of Arduino with LED*

Step 3: Connection of Arduino With Buzzer
The circuit connections are shown in Figure 3:
a. Connect Positive terminal (Red Wire) of Buzzer to Arduino Pin no. 8.
b. Connect Negative terminal (Black Wire) Of Buzzer to Any Ground Pin.

Step 4: Connection of Arduino With LCD Screen
To wire your LCD screen to your Arduino, connect the following pinsas shown in Figure 4:
a. LCD RS pin to digital pin 12
b. LCD Enable pin to digital pin 11
c. LCD D4 pin to digital pin 5
d. LCD D5 pin to digital pin 4
e. LCD D6 pin to digital pin 3
f. LCD D7 pin to digital pin 2 additionally, wire a 10K pot to +5V and GND, with its wiper (output) to LCD screens VO pin (pin3).

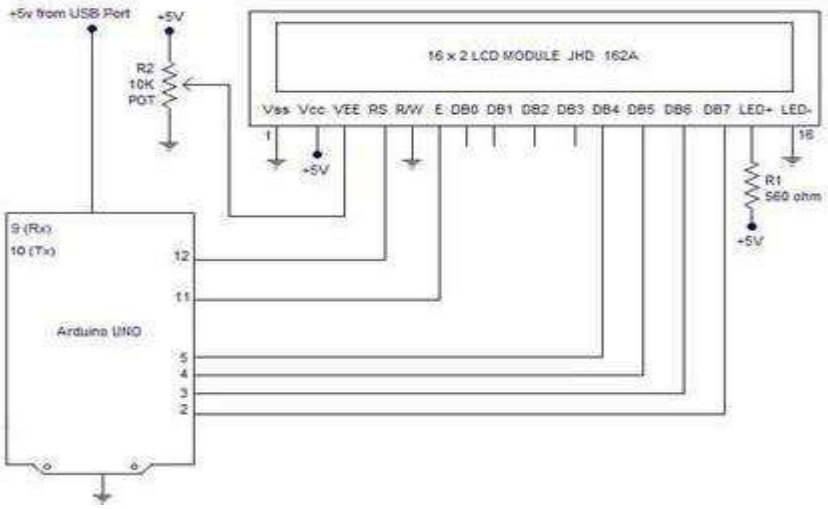

Figure 4: *Connection of Arduino with LCD Screen.*

Step 5: Connection of GSM Module to Arduino
Connect Rx to Pin 10 of Arduino. Vcc or Power Jack to +12 Volt Make GND or Ground pin common to all other components and modules.

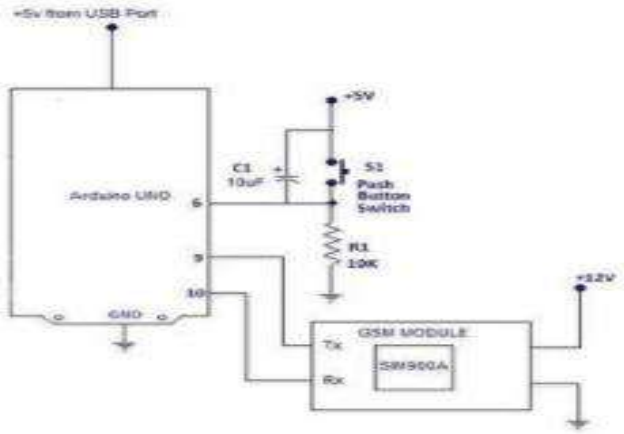

Figure 5: *Connection of Arduino with GSM module*

There are two ways of connecting GSM module to arduino. In any case, the communication between Arduino and GSM module is serial. So we are supposed to use serial pins of Arduino (Rx and Tx). So if you are going with this method, you may connect the Tx pin of GSM module to Rx pin of Arduino and Rx pin of GSM module to Tx pin of Arduino. You read it right ? GSM Tx –> Arduino Rx and GSM Rx –> Arduino Tx. Now connect the ground pin of arduino to ground pin of gsm module! So that˝s all! You made 3 connections and the wiring is over! Now you can load different programs to communicate with gsm module and make it work[1].

IV. Conclusion

The need for home security alarm systems nowadays is a serious demand. As the number of crimes is increasing every day, there has to be something that will keep us safe. We are all aware of the high end security systems present in the market but they are not easily available to everyone.

We therefore intend to provide a solution by constructing a cost efficient electronic system that has the capability of sensing the motion of the intruders and setting off the alarm along with sending a SMS alert to the user. The basic idea behind this research paper is that all the bodies generate some heat energy in the form of infrared which is invisible to human eyes. But, it can be detected by electronic motion sensor.

The system involves the use of Arduino, motion sensor, buzzer, LCD display, SIM800 GSM module and a simple program. The sensor detects any motion in its permissible range and triggers the alarm.

This paper can also be used as an startup idea for those places where the demand of security is High. Therefore, it can play a role of job creator.

The Arduino is a powerful little beast and a great platform for building low-cost, but highly capable, embedded systems. The interfaces built into its GPIO connector make it easy to bolt on modules using simple low-cost electronics and a bit of configuration to create very functional and flexible systems. The inclusion of a dedicated camera interface and networking interfaces give you everything you could possible need for an Internet-connected home security system.

I've covered a lot of topics in this book, and I could have gone on and on, but I hope that what I have presented has been done in a structured and methodical way, and has given you the tools and techniques to carry on this journey so that you are able to create the perfect home security system for your needs.

In the end, we made the laser security in low budget. It had been protect in full security.

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