

Theft Intimation of Objects using PIR Sensor

S.Aswinilakshmi¹, A.Bala² and V.Siva Kumar³

^{1,2}UG Student, Department of Computer Science and Engineering, National Engineering College, Kovilpatti, India.
Email: aswiniseenivasan25@gmail.com, bala1841997@gmail.com

³Assistant Professor, Department of Computer Science and Engineering, National Engineering College, Kovilpatti, India.
Email: sivakumarrakesh@gmail.com

Article Received: 24 January 2018

Article Accepted: 27 February 2018

Article Published: 08 April 2018

ABSTRACT

In recent years theft has been seriously increased and there is no safety for people and their properties. Securing and monitoring have become the main objective for controlling theft. Security plays a vital role in monitoring a building in the absence and presence of people. Most of the theft happens by door break-ins. Sensor based theft intimation system are high technology and ensure the real-time operation and indication of the threat to the house. Securing and monitoring have become the main objective for controlling theft. If someone tries to break the house door, the microcontroller gets an interrupt through a switch mechanism connected to the system and commands the GSM modem to send an SMS. The owner receives the message.

Keywords: Arduino UNO board, PIR sensor, WiFi Module.

1. INTRODUCTION

Theft Intimation systems decrease cost and effort and enhance system flexibility. In Home or Industrial automation system there are many interconnected devices for controlling various functions within a place. Mobile devices are portable and it provides a user interface in a home or Industry automation system. It provides better security system where there is high level of theft. This tends to the use of Wi-Fi Module, mobile phone and electronics circuit to achieve an automated system which is programmed to work as a thinking device to accomplish this purpose. In this project motion sensors with low-power consumption are placed where an intruder must pass through. According to the sensor's signals received by microcontroller, a call will be send to mobile station through a GSM modem and thus warns the presence of unauthorized user in the home to owner. In recent years theft has been seriously increased and there is no safety for people and their property. Security plays a vital role in monitoring a building in the absence o presence of people. Theft refers to the crime involving the taking of a person's property without their permission. Most of the theft happens by door break-ins. 75% of theft occurs during night time. The thief may take off the fuse, so they cannot be easily identified and if they caught, they can be easily escaped. Bluetooth is mainly used to provide the message and the application which is used to conserve the power when the system is not in use. This will also give alert to the owner through a mobile phone. In this industrialized world, stealing valuable and prosperous things has become a serious concern for police and common people. Theft may mentally affect the people because their hard work for years has been lost in a single day.

1.1. It has following features

2. The device consumption power is low: The microcontroller used is Arduino Uno which consumes less power.
3. Low cost system: The controller and all other sensors are inexpensive.

4. Friendly user interface
5. Quick response: Whenever an undesired event occurs a message will be displayed with in a second on the phone.
6. Notify the Security firm or the owner with the emergency and its type and notification is done through generation of the message on the phone.
7. System is highly accurate: Correct status of the sensors is updated immediately.
8. 24×7 hours functionality of the system.
9. The system is reliable and flexible.

2. RELATED WORK

Even though many technologies have been developed to prevent and stop theft, still many thefts occur despite these techniques. Theft mainly occurs on the carelessness of the people. So a proper security system is to be developed. In some cases, people inside the house will be attacked by the intruders. All home security systems work on the basic principle of securing entry points like doors and windows. Despite the size of the house or the number of doors and windows or inner rooms a house owner needs to protect, the only difference is in the number of security components employed throughout the house and monitored. Theft mainly occurs on the carelessness of the people. In such case, one should ensure that their house doors and windows are closed and locked. A detailed inventory must be kept of the valuable possessions.

The existing method uses various technologies for controlling theft and providing security for houses. Technologies such as GSM, ZigBee, WSN are used. Let us consider the different existing systems as follows. Home security is becoming necessary nowadays as the possibilities of intrusion are increasing day by day. A traditional home security system gives the signals in term of alarm. The Global System for Mobile Communications (GSM) based security systems provides enhanced security whenever a signal from the sensor occurs and the message is sent to the given number. This also provides home automation. Conventional security systems keep owners and their property safe from the intruders by giving an indication. Home security plays an important role to protect valuable things at home from intruders. IR sensor is placed to detect the person. On detecting a person passcode will be opened to enter the secret code. By entering the correct passcode based on owner's reply door will be opened. Whereas on wrong passcode buzzer alert is given. The communication is carried out by GSM.[12] The evolution of fingerprinting technology gives security to various places. Two stage verification process are used for smart homes, they are by using device fingerprints and login credentials. It provides geographical location while computing fingerprint. This device identification can identify about 97.93% of the devices. [3] Microcontroller based automated home security system is password protected with a LED-based resistive screen which operates by detecting a difference in light intensity captured by photodiode which is emitted by surrounding red LEDs and reflected. Fire alarm system uses temperature sensor which senses a sudden increase in temperature and activates the alarm.

3. PROPOSED METHODOLOGY

In our proposed work, the stranger or the unauthorised person entry in house or industry is sensed by the PIR sensor. After the sensor recognise the oscillation due to stranger entry the information is send to the wifi module. The information in wifi module if any, then the same information would be in server also. By fetching the information like the mobile number of the owner of house or industry to intimate the entry of the stranger. We may include an alternative mobile number for our convenience.

3.1. MODULES

The application works as an automatic incident management application that intimates the user if any stranger entry in their house during the owner absence. Modules used here are as follows,

1. Arduino UNO Board
2. PIR Sensor
3. Wi-Fi Module
4. Server side

3.2. Arduino UNO Board

1. The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.
2. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduno, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform.

3.3. PIR Sensor

1. The PIR sensor stands for Passive Infrared sensor. It is a low cost sensor which can detect the presence of Human beings or animals. There are two important materials present in the sensor one is the pyroelectric crystal which can detect the heat signatures from a living organism (humans/animals) and the other is a Fresnel lenses which can widen the range of the sensor. Also the PIR sensor modules provide us some options to adjust the working of the sensor.
2. The two potentiometers (orange color) are used to control the sensitivity and trigger on time of the sensor. Basically the Dout pin of the sensor is present in between the Vcc and Gnd pins. The module works on 3.3V but can be powered with 5V as well. On the top left corner it also has a trigger pin setup which can be used to make the module work in two different modes. One is the "H" mode and the other is the "I" mode.

In “H” mode the output pin Dout will go high (3.3V) when a person is detected within range and goes low after a particular time (time is set by potentiometer). In this mode the output pin will go high irrespective of whether the person is still present inside the range or has left the area. We are using our module in “H” mode in our project.

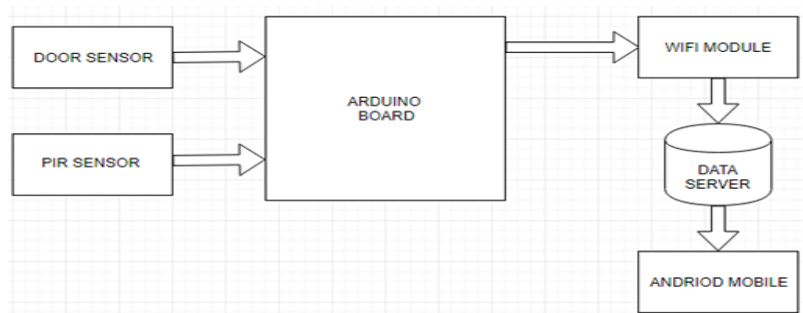
3. In “I” mode the output pin Dout will go high (3.3V) when a person is detected within range and will stay high as long as he/she stays within the limit of the Sensors range. Once the person has left the area the pin will go low after the particular time which can be set using the potentiometer.

3.4. WI-FI Module

1. The ESP8266 WiFi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much WiFi-ability as a WiFi Shield offers (and that’s just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.
2. This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interfaces, it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.
3. There is an almost limitless fountain of information available for the ESP8266, all of which has been provided by amazing community support. In the Documents section below you will find many resources to aid you in using the ESP8266, even instructions on how to transforming this module into an IoT (Internet of Things) solution!

3.5. Server Side

1. The notification sends by the server is received and displayed in the form of alert message to the user.
2. The alert message is send to the numbers that have been stored by the user in the server.
3. Hence the alert message will be sent to the owner of the house or industry and nearby police station.



Overall architectural design

4. CONCLUSION AND FUTURE ENHANCEMENT

In this proposed paper, a theft monitoring embedded security system is designed using Arduino UNO to detect theft at home from intruders. Movement of any object near the sensor is sensed and alert is given when the system is under the total shutdown. In addition passcode lock system and indicator are used as for further security. Hence the status of the house can be monitored and leads to effective security management. The system is more effective and the cost is less than the previous one.

REFERENCES

- [1] Adnan Ibrahim, AfhalParavath, Aswin P. K., Shijin Mohammed Iqbal and ShaezUsman Abdulla, "GSM Based Digital Door Lock Security System," IEEE International Conference on Power, Instrumentation, Control and Computing (PICC), vol.15, pp.4673-8072, 2015.
- [2] Muthukumaran. N and Ravi. R, 'Hardware Implementation of Architecture Techniques for Fast Efficient loss less Image Compression System', Wireless Personal Communications, Volume. 90, No. 3, pp. 1291-1315, October 2016, SPRINGER.
- [3] Muthukumaran. N and Ravi. R, 'The Performance Analysis of Fast Efficient Lossless Satellite Image Compression and Decompression for Wavelet Based Algorithm', Wireless Personal Communications, Volume. 81, No. 2, pp. 839-859, March 2015, SPRINGER.
- [4] Muthukumaran. N and Ravi. R, 'VLSI Implementations of Compressive Image Acquisition using Block Based Compression Algorithm', The International Arab Journal of Information Technology, vol. 12, no. 4, pp. 333-339, July 2015.
- [5] Arun Cyril Jose, Reza Malekian and Ning Ye, "Improving Home Automation Security; Integrating Device Fingerprinting Into Smart Home," IEEE Transactions on Consumer Electronics, vol. 4, pp.5776-5787, 2016.
- [6] Muthukumaran. N and Ravi. R, 'Simulation Based VLSI Implementation of Fast Efficient Lossless Image Compression System using Simplified Adjusted Binary Code & Golomb Rice Code', World Academy of Science, Engineering and Technology, Volume. 8, No. 9, pp.1603-1606, 2014.
- [7] Ruban Kingston. M, Muthukumaran. N, and Ravi. R, 'A Novel Scheme of CMOS VCO Design with reduce number of Transistors using 180nm CAD Tool', International Journal of Applied Engineering Research, Volume. 10, No. 14, pp. 11934-11938, 2015.
- [8] Muthukumaran. N and Ravi. R, 'Design and analysis of VLSI based FELICS Algorithm for lossless Image Compression', International Journal of Advanced Research in Technology, Vol. 2, No. 3, pp. 115-119, March 2012.
- [9] Manoj Kumar. B and Muthukumaran. N, 'Design of Low power high Speed CASCADED Double Tail Comparator', International Journal of Advanced Research in Biology Engineering Science and Technology, Vol. 2, No. 4, pp.18-22, June 2016.

- [10] N. Muthukumar, 'Analyzing Throughput of MANET with Reduced Packet Loss', *Wireless Personal Communications*, Vol. 97, No. 1, pp. 565-578, November 2017, SPRINGER.
- [11] Gerard Rushingabigwi, Ligu Sun, Godfrey Lugolobi and Frank Mwezi, "An Electric Circuits Remote Switching System based on GSM Radio Network," *International Journal of Research in Engineering and Technology*, vol.3, no.11, pp. 2321- 4708, 2014.
- [12] P.Venkateswari, E.Jebitha Steffy, Dr. N. Muthukumar, 'License Plate cognizance by Ocular Character Perception', *International Research Journal of Engineering and Technology*, Vol. 5, No. 2, pp. 536-542, February 2018.
- [13] N. Muthukumar, Mrs R.Sonya, Dr.Rajashekhara and Chitra V, 'Computation of Optimum ATC Using Generator Participation Factor in Deregulated System', *International Journal of Advanced Research Trends in Engineering and Technology*, Vol. 4, No. 1, pp. 8-11, January 2017.
- [14] Keziah. J, Muthukumar. N, 'Design of K Band Transmitting Antenna for Harbor Surveillance Radar Application', *International Journal on Applications in Electrical and Electronics Engineering*, Vol. 2, No. 5, pp. 16-20, May 2016.
- [15] Akhil. M.S and Muthukumar. N, 'Design of Optimizing Adders for Low Power Digital Signal Processing', *International Journal of Engineering Research and Applications*, Vol. 5, pp. 59-65, March 2014.
- [16] JayashriBangali and ArvindShaligram, "Design and Implementation of Security Systems for Smart Home based on GSM technology," *International Journal of Smart Home.*, vol.7, No.6, pp.201-208, 2013.
- [17] Kaur.I, "Microcontroller based Home Automation System with Security," *International Journal of Advanced Computer Science and Applications*, vol. 1, no. 6, pp. 60-65, 2010.
- [18] Kim H.S, and Lee C.G, "Wireless USB based home security system on the OSGi service platform," *International conference on Consumer Electronics*, pp. 1-2, 2007.