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## A Survey on Intelligent Home Security System Using GSM

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**ABSTRACT:** There has been much research done on various types of Home Security systems like Sensor based Home security System, Figure print, Palm print and keypad activation for authentication and so much. All type of Security system uses technique of GSM module. A traditional home security system gives the signals in terms of alarm. However, the GSM (Global System for Mobile communications) based security systems provides enhanced security as whenever an intruder comes in the house, a text message is sent to a desired number to take necessary actions.

**KEYWORDS:** GSM (Global System for Mobile communications), Microcontroller, SMS (Short Message Service)

### I. INTRODUCTION

Security is one thing that is very influential in today life; everyone needs security guarantees when they work. Like health, security is an important aspect in life. Hence, various kinds of development in the technology field is designed to provide security at all times to protect they assets and privacy. In addition to the course with the application of security system, it can reduce the crime rate in the society especially the crime of theft at home. Due to the increasingly rapid movement of people, making them requires a security technology that has the characteristics of mobile technology in terms of getting information easily and quickly. This Paper mainly focuses on providing security when the user is away from home. SMS (Short Message Service) is a GSM mobile technology that can perform remote communication wherever they are. Through this facility messages can send quickly, accurately and at a low cost. Mobile phone with SMS facility will be very useful when applied to integrated security systems, where the information send by a security system and the information received by the user mobile phone in the form of SMS.

### *GSM Technology*

GSM Modem:

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS.

### **What is GSM?**

GSM stands for Global System for Mobile Communication. It is a digital cellular technology used for transmitting mobile voice and data services. GSM is the most widely accepted standard in telecommunications and it is implemented globally. GSM is a circuit-switched system that divides each 200 kHz channel into eight 25 kHz time-slots. GSM operates on the mobile communication bands 900 MHz and 1800 MHz in most parts of the world. In the US, GSM operates in the bands 850 MHz and 1900 MHz. GSM makes use of narrowband Time Division Multiple Access (TDMA) GSM provides basic to advanced voice and data services including roaming service. Roaming is the ability to use your GSM phone number in another GSM network. GSM digitizes and compresses data, then sends it down through a channel with two other streams of user data, each in its own timeslot.



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## Advantages of GSM

- Improved spectrum efficiency
- International roaming
- Low-cost mobile sets and base stations (BSs)
- High-quality speech
- Compatibility with Integrated Services Digital Network (ISDN) and other telephone company services
- Support for new services
- 

## Features of GSM

- Short Message Service which allows you to send and receive 126 character text messages.
- Ability to use same phone in a number of network-related countries.
- Allows data transmission and reception across GSM networks at speeds up to 9,600 bps currently.
- Forwarding of calls to another number. More capacity, ensuring rapid call set-up.
- Handsets also smaller and more robust.
- Place a call on Hold while you access another call.
- Encrypted conversations that cannot be tapped.
- Emergency Calls - In the majority of countries, the global 112 emergency number can be dialed free.
- No-static connections.

## II. RELATED WORK

Nikhil Agarwal, G.Subramanya Nayak[1] uses password protected door system methodology in home automation system. The door lock is password protected with an LED based resistive screen input panel which operates by detecting difference in light intensity captured by the photo diode which is emitted by surrounding red LEDs and reflected by the finger. The display is a 16X2 LCD panel. IR Laser sensors are used to detect any obstacle while monitoring the windows and doors at night or when away. They use the following components in those automation system i.e. IR sensors, LCD Display, Microcontroller, Relay, Power Supply, GSM Modem.

Visa M. Ibrahim, Asogwa A. Victor, S. Y. Musa[2] constructs his security system for car protection. In that concept if thief tries to rob a car it automatically demobilizes the car by disconnecting the ignition key supply from the car battery. This now makes it impossible for anybody to start the car, let alone moving with it. In an attempt of theft through the car doors or boot, the system sends the message to the car owner and at the same time starts the alarm. This design popped out due to the increasing rate at which packed cars are stolen especially in our country, but with this design this packed car is being monitored irrespective of where it is packed, provided there is GSM network coverage.

Jayashri Bangali, Arvind Shaligram[3] says that Automated home or intelligent home which indicates the automation of daily tasks with electrical appliances used in homes and security is an important aspect or feature in smart home applications. The new and emerging concept of smart homes offers a comfortable, convenient, and safe environment for occupants. Conventional security systems keep homeowners, and their property, safe from intruders by giving the indication in terms of alarm. However, a smart home security system offers many more benefits. He proposed Two system in his project i.e. one is based on GSM technology and other uses web camera to detect the intruder. First security system uses a web camera, installed in house premises, which is operated by software installed on the PC and it uses Internet for communication. It detect motion of any intruder in front of the camera dimension and camera range. The second security system is SMS based and uses GSM technology to send the SMS to the owner. The proposed system is aimed at the security of Home against Intruders and Fire. In any of the above cases happens while the owners are out of their home then the device sends SMS to the emergency number which is provided to the system.

Aayush Aggarwal, R.C. Joshi[4] designed his WSN and GSM based Remote Home Security System by combining the advantages of Wireless Sensor Networks and GSM technology is presented. It can detect intrusion, fire etc. and inform the user remotely about the incidence with distance playing no barrier. In those security system intruder has detect if they comes under the dimension of WSN.

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R.Anandan, Mr.B.Karthik, Dr.T.V.U.Kiran Kumar [5] says that they have tried to increase the standard by combining new design techniques and developed a low cost home and industrial automated security systems. They aim to overcome the flaws made by many other security device as it is most effective in security purpose. It is cheaper and can be maintained easily than any other security device.

This device works in two way modes. i e.

- a) Internal mode
- b) External mode

Internal mode is selected by the user when they are inside the wireless security area, the entire sensor except sensor will be activated and the buzzer connected with the microcontroller will give an alarm and the reason for the insecurity will be displayed in the LCD connected to the microcontroller. When the external mode is selected by the user when they are outside the wireless security area, all the sensor will be active and the security area address which is pre-programmed, along with the problem will be sent as SMS to the specified police station, fire station, security room and also to the user at the time of insecurity, fire accident, unwanted movement of persons etc. which is sensed by the respective sensor.

### III. PROPOSED ALGORITHM

#### A. Proposed system:

This system construct with AVR ATmega8 microcontroller which contains a piece of code for a specific action. Sensor is for detecting the object. The action will be taken by the GSM modem i.e. to alert an owner about intruder or danger to house. PC or laptop will be used for comparing the images.

#### B. System Design

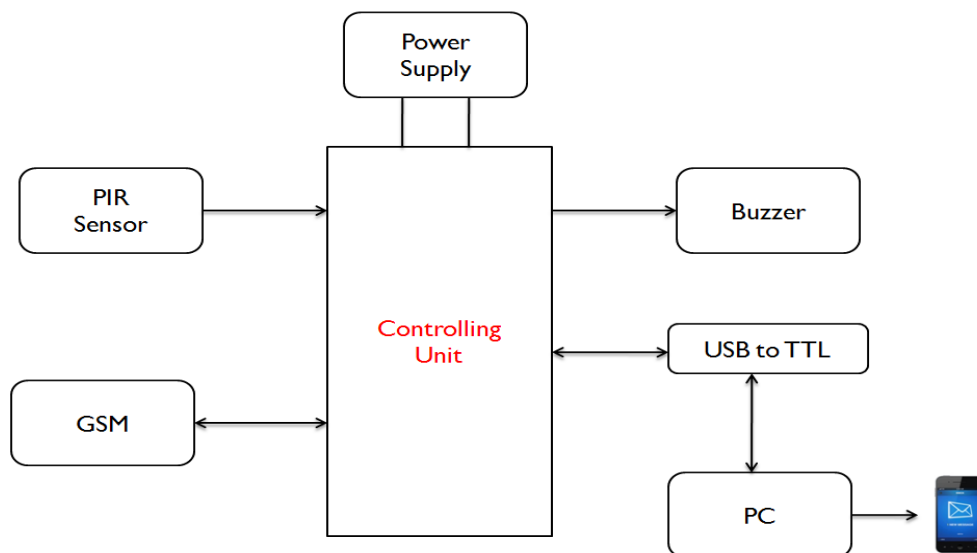


Figure 1: Block Diagram of system

#### C. ALGORITHM

- Step 1: System will activate.
- Step 2: PIR sensor detects the object
- Step 3: Sensor sends the command to the controller



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- Step 4: Controller send the command to the pc
- Step 5: Pc's camera will capture the image
- Step 6: Captured images will be compared to loaded images
- Step 7: if matches, no message will be send, otherwise message will be send through GSM module
- Step 8: Again step 2 will be repeated

### D: Software Used

The software program developed is used to control all the functions of the system and it is developed using the AVR studio. The AVR studio is a specific tool for Atmel based assembly program development and debugging. Also we are using image processing.

### IV. RESULTS

This system tested on the latest technology available in Smartphone which gives a proper result. This system is easy to use and very simple. The model can be installed with a economical cost. The GSM technology gives a good response after received a message of particular action from microcontroller. SMS received time to house owner is basically depend on the signal strength range that you have got through mobile tower. We have developed and tested the model using C language.

### V. CONCLUSION

The GSM based home security system has been designed and tested with the mobile network. The user can get alerts anywhere through the GSM technology thus making the system location independent. A flexible way to control and explore the services of the mobile, AT commands is used in the system. The communication of home is only through the SMS which has been tested with the mobile networks and is working on any mobile network.

It is a real-time monitorable and remote controlled system developed with simple hardware which simplifies the possibility of error free security system. This system can be easily implemented with maximum reliability and the high security with low cost is a special enhancement from the existing systems for Home security.

Functionality	Wireless Security System	Motion Sensor	Acoustic Sensor	Digital Security System	Security Alarm	GSM Based Security System (Our System)
Reliability	X	X	X	✓	X	✓
User Friendly	-	-	-	X	X	✓
Cost effective	X	✓	✓	X	✓	✓
Easy installation	✓	✓	✓	-	✓	✓
Portability	✓	X	X	X		X
Other Factors	-	Detects Motion only And triggers alarm	Detects sound only And triggers alarm	Supports cameras	Quick response	Detects Sound, Smoke & LPG Leakage, cameras embedded for live streaming, Auto Door Locks, Door bell detector, Trapping System

From above table we concluded that GSM based Security System is better than Other Security System.

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