A Review: Antitheft Sensor Controlled Home Security System

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***Abstract*— Security is one of the important systems in the various fields which are specially used for home security purpose. Applications such as detecting unauthorized entry into home, hotels, industries, labs which created need for cost effective home security system. This system consists of 89S52 microcontroller board, IR sensor module, Wireless camera to capture the image of a person, Vibration sensor if someone tries to break the door or glass of the home, Micro switch, ASK transmitter and receiver, Proximity sensor which is used to sense the unauthorised entry, LCD to display the resulting status and GSM module for the communication such sending message and missed call to the user and nearby police stations in any emergency.**

***Keywords*— Microcontroller, Sensor, Wireless Camera, LCD, GSM.**

I. INTRODUCTION

Security may be a big challenge everywhere because theft is increasing day by day due to the unsafe and insecure security system in homes, commercial complexes and industries. Several conventional technologies are available to stay home properties safe from intruders, but commonest smart home security systems work on wireless Global System for Mobile communication (GSM). By this our security system provides good amount of security for the users. This technique is often easily operated and installed anywhere. The user is notified by Short Messaging System (SMS) or an easy text message, if any threat or problem detected by the safety system. There's a connection between microcontroller and GSM modem for sending the message to the owner.

The aim of the project is to switch an existing safety and security model for the house security system. This project designs an embedded system. For remote monitoring for the domestic environment nowadays home monitoring is important for safety and security purpose, which help us to understand the status of the home in our absence. The parameters inside the home will detect the unauthorized entry and illegal activities using respective sensors. The unauthorised entry and therefore the detected data are transferred to the ASK receiver with the assistance of ASK transformer with the assistance of microcontroller and GSM modem which is installed within the security system. The advantage of this automated security system is that it offers faster reaction time and accurate detection during the emergency by a SMS to the nearest police headquarters and therefore the home owner.

II. BLOCK DIAGRAM

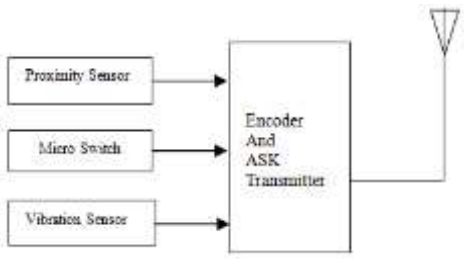

Fig 1: Block diagram of security system inside the home

An antitheft sensor controlled home security system consists of multiple sensors, encoder and ASK Tx in fig1. The IR based Proximity sensor is employed to sense unauthorized entry. A proximity sensor detects the presence of objects that are nearly placed with none point of contact. Since there's no contact between the sensors and therefore the sensed object and lack of mechanical parts, these sensors have long functional life and high reliability. Vibration sensor is employed to detect if a person tries to interrupt the door or window, and therefore the output of vibration circuit is fed to the encoder to the input and to the ASK Tx to transmit the signal. If anyone within the range in critical position one can simply press the micro switch in order that the encoder will get the signal. Encoder converts the parallel data into serial data and fed to the ASK Tx for serial transmission. ASK Tx transmits the bits in serial mode with a carrier frequency of 433MHz.

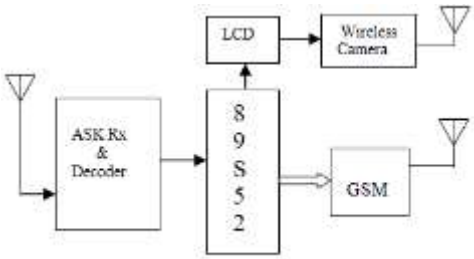

Fig 2: Block diagram of security system outside the home

ASK Rx receives the digital data transmitted from the ASK Tx and is fed to decoder. The decoder converts the serial data into parallel data and fed to the microcontroller. The 89S52 microcontroller is that the heart of the project, it controls the working consistent with the program meaning microcontroller sends appropriate pulse/signals to display unit to display the parameter problems and send the message to the GSM modem. With the assistance of GSM modem the SMS is transmitted for sending message, a GSM modem named SIMCOM 300 with RS232, power supply. The interface between GSM modem and microcontroller also can be done through with the assistance of wires.

III. LITERATURE SURVEY

A literature survey or a literature review in a project report is that section which shows the various analyses and research made in the field of interest, and it is the most important part of the report as it gives a direction in the area of the research.

Javare et al [1] have proposed door lock system using Bluetooth technology to improve security in home automation.in this Bluetooth is used to establish the connection between user and pc so as to access the door. Sensor like motion sensor and vibration sensor are used to detect the woman. The system is also facilitated with features like SMS, Email, Anti-burglar that provide easy way for the owner to get the notified when user appears at the door as well as when user try to access the door without permission. Owner can also check the log details by interacting with the PC Admin. The camera is connected to micro-controller which is used to take snaps of the users at the door and a wireless camera and monitoring control system which consist of many different activities like detecting user, verification, notification, perform action according to request, also further notifies the owner about the current status of the door.by using this technology the percentage of crime can be reduce.

Zhao et al [2] have proposed wireless of security system which contains GPRS/GSM (General Packet Radio Service/Global System for Mobile) and three kinds of sensor like door security nodes, infrared security nodes and fire alarm nodes. The wireless technology has some benefits compared to non-wireless technology like installation and maintenance is easier and reduces the cost of the system. All the sensor are charged by batteries which results in low power consumption. This system as a friendly user interface which include sixteen capacity sensor keys and LCD. In addition, wireless transceiver modules are used to transport other information such as voice and picture rather than just alarm signals. This secured with a login password.

Islam et al [3] have proposed home security based on micro-controller. The system can monitor doors and windows of a house and can set alarm, warning signals to a nearest police station if anybody tries to breaks or windows. PIC18F452 is one of the most popular micro-controllers which have lot of features to design embedded system. They could not build the circuit on printed circuit though tested the design using bread board in embed system laboratory.

Kim et al [4] during this work have proposed home security system supported sensor network (HSSN) configured by sensor nodes including radio frequency (RF), ultra-sonic, temperature light and sound sensors distributes the system into three parts that are a home server, the sensor network and a mobile robot. The three parts are connected organically through the wireless network, RF and Bluetooth. They implemented the safety mood transition for low power and resource consumption speedy and accurate path planning using the integrated information from both the local sensors of mobile robot and sensor nodes.

Rana et al [5] during this work has designed and implemented a price effective and it flexible and powerful home security system using the GSM technology. The most advantage of GSM network is that its wide area coverage even to remote country and it's also battery powered. The user has got to activate the alarm through the appliance when ever user leaves the house. If the users unexpectedly left any electrical household appliance in running condition then they might also turn that off by the application. This paper presents an unique and easy way to control appliances and also on get notified about this condition of the house.

Shahzad et al [6] have focused on a low-cost solution to intrusion protection which features a very-short alert time and is nearly fail prove is presented. The most purpose of proximity sensor within the mobile phones is to detect whether the user is taking note of the decision without the loud speaker or with loud speaker. The paper explains how a simple app using proximity sensor not only detects an intruder but also informs landowner of the intrusion within second of intrusion. This paper demonstrates all of which will be accomplished without spending extra money and without hiring guard's pay roll. By deploying this, privacy does not get compromised. It takes only two smart phones then internet connections to guard homes and properties against any illegal intrusions.

Hoong et al [7] have proposed the investigation of the potential of full home control security system which is that the aim of the Home Automation Systems in near future. During this technology the GSM modem is employed to regulate the conditional system, and security system via SMS, which allows the user to regulate the target faraway from residential using the frequency bandwidths. Home owners are going to be ready to receive feedback status of any illegal activities are under taken within the home PIC16F887 micro-controller with the mixing of GSM provides the smart automated home system with the specified baud rate of 9,600bps.The proposed prototype of GSM based home automation system was implement and tested with the at most of four loads and shows the accuracy is bigger than or equals to 98%. This technique is user-friendly interface allowing the user to interact and control varies devices with the touch of a couple of buttons. Further researches are conducted to research the performance of other home automation system. This work implements SMS based control for home appliance's using the GSM architecture without accessing the local network.

Sharma et al [8] have proposed Android interface-based GSM home security system where many automated systems has been developed which informs the owner during a remote location about any intrusion or plan to intrude within the home. They developed ANDROID application, a java-based OS, which sense the message on a mobile device on possible intrusion and subsequently replay SMS which helps in triggering of an alarm within the remote home and make others conscious of the possible intrusion. GSM modem are going to be installed and connected to the door and sense the warning message to the registered number within the modem. This technique is formed GSM friendly, thereby making the appliance highly robust across different mobile devices and sort of users.

Saranu et al [9] have proposed a home security for the theft by implementing smart security system using PIR.PIR is an electronic sensor that detects the motion of objects, the measuring the extent of IR radiation. This principle is employed to detect the stranger entering in to the house. The camera and PIR sensor are integrated in such how that any movement within the room, then the camera activates automatically an then the house owner can view the live steam of motion that happen inside the house by the stranger. A mail and residential call services are included within the system to alert the owner about the stranger action. The difficulty that folks face now each day, the system can solve this problem.

Ishiguro et al [10] have proposed home security system for the nuclear family with dual working parents. One among the most advantages is that monitoring data is kept in a home web server and is shared by family members only. Aside from the fire alarm and burglar alarm systems, video surveillance system is another commonly used to monitor the things. The system will record the video and it sends the video to people at the remote. They would like to be aware of the security situation at home, even when they aren't at home. The system scale is little and helpful.

Zaman et al [11] have proposed the innovation of varies programmed controls, home security system. These innovation technologies are being upgraded by people to enhance the standards of human lives during this era and everyone are using technological advances in many ways. This technological contains a fingerprint sensor, door Lock, LCD keypad shield, keypad and a webcam ad will work using Arduino Uno micro-controller sensor will be used to detect any unwanted movement inside the house. If the sensor finds any interruption, immediately the lights activate on and trigger the buzzer and therefore the GSM module sends an SMS instantly to the owner if anyone breaks into the house.

Hussein et al [12] have proposed wireless network technologies which give remote monitor and control for appliances. This technological aims are to show the house into a sensible range in which many tasks are often performed especially monitoring inside the home. Home automation system is a neighbourhood that has caught several attentions by both the academic and business fields. The main aim is to supply the power to simulate the wireless tasks including monitoring and controlling of a digital door lock.

Selvarasu et at [13] have proposed home automation technique supported ARM controller during this technique IR sensor is used to detect the person to get the pass code within the keypad and at an

equivalent time the SMS are going to be sent to the owner for authentication. If someone tries to the enter the pass code and if it's correct the door are going to be opened, if not the intimated message are going to be sent to the owner and immediately time buzzer are going to be activated. Android uses a java-based language. To develop an Android app, a tool called Eclipse has used. An Arduino Mega2560 micro-controller is used during this project for the convenience of programming, the Mega uses the Atmel ATmega2560 chip. The door positions are going to be determined by a magnetic switch. The whole interface consists of the door and two LEDs. One LED was to point the power, and therefore the other was to point the door.

Prince et al [14] aims in design and implementation of the micro-controller based SMS system. The project provides the answer to the issues faced by the house owners like switching ON/OFF, water pumping machine, generator set, to controlling of home appliances like Television, Lighting system, and other industrial appliances wirelessly via SMS during this project. The GPRS modem is employed to receive the message send by the user. It's interfaced with the MAX232 IC for further signal and conversion. The MAX232 is directly coupled to the micro-controller for further control and feedback messages.

Assaf et al [15] in this paper the planning and implementation control of security based on FPGA. The user here can interact directly with the system through an internet based interfaced over the web, while home appliances like air conditioning, lights, door lock and gates are remotely controlled through a user-friendly website. All lights and doors are displayed through an internet page which will access through any modern browser. Lights are often set as on or off with the page. Doors are often locked or unlocked remotely also. The system is capable of monitoring entry points like doors and windows in order that if any breach occurs, n alerting email message is sent to the house owner instantly.

Chooudhury et al [16] it uses a microcontroller for system control, GSM technology for communication and sends SMS containing the emergency message and therefore the GPS location of the sender. The project consists of an 8-bit microcontroller AT mega 16, GSM SIM900A module and two Android applications for user interface with the hardware. Microcontroller and GSM module are put within the same box called as device alongside a push-button. On pressing the push button the emergency contact receiver the emergency message alongside with the GPS location of the sender.

Brundha et al [17] have proposed Client-Server service and device friendly approach for Home automation during this home automation system Bluetooth is used for the device diversity, Client-Server service. Understanding user requirement according by sensing, reporting the events to centralized entity. Centralized entity analysis and triggers the workflow, workflow updates the interactive channels or the house devices. The home automation is formed efficient by the safety factor alerting about the unknown's entering the house. The user can get the images of the person entered the home. Along with the security this technological is additionally having a WI-FI module. The system recognized the facial and raises an alarm in intruder is found. It alerts the user about the condition of the home by providing the notification to mobile.

Mahafza et al [18] have proposed the Secure-Way Affordable Home Security System. A multi-purpose home security system, the Secure-Way system are often adjusted and updated according at any time by users. It's remote learning capabilities. The system utilizes 9-volts battery, push on/off button, LED indicator and thus includes three modes i.e. "wait for arming "will wait for message in order that it's able to take the action consistent with things within the area, "RECORDING" ,will record the signal is sent through the video camera and "STOP", signal is sent out, unless the motion sensor had been interrupted again.

Subramaian et al [19] have proposed Effect of power lines on performance of Home Control System (HCS) which monitors, control and secure the house. HCS is an integration of Home Appliance Control System (HACS) and House Security System (HSS). HSS monitors network security device in home. HACS allows owner to regulate appliance. They use X10 protocol technology for communicating among the device utilized in a home automation power cable data transmission like singling and controlling where signals involves radio frequency and digital information so as to attach the HCS to the house appliances.

Mahler et al [20] have proposed mobile hardware to create a home security supported Smartphone sensor. The door related event like opening and shutting have unique vibration signature in comparison to environmental noise which can be captured by accelerometer present within the Smartphone, when the mobile is fixed on the wall near the door. The rotation of a door are often detected and captured by the magnetometer of a mobile when the phone is fixed on a door. The design like machine learning and threshold based methods are wont to detect the opening and shutting of a door based on accelerometer and magnetometer data and notifies the owner via email, SMS and calls if something goes wrong.

IV. CONCLUSION

This paper provides a quick analysis of various usage of home security system, which says security is most vital in lifestyle and existing add the sector of antitheft sensor controlled home security system, which monitors both inside and out of doors the house. The system will detect the illegal activities within the absence of user if something goes wrong accordingly notifies the user through SMS or missed call alongside with the image/video of the intruder and exact location with the assistance of GSM.

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