Implementing Android Based Intelligent Mobile Home Automation Security System

Mr. Niraj R Chauhan  
Dept. of Computer science & engineering, P.R.Pote Engg & management College, Amravati  
nirajchauhan.nri24@gmail.com

Prof. A.B.Gadicha  
Dept. of Computer science & engineering, P.R.Pote Engg & management College, Amravati

Prof. K.K.Chhajed  
Dept. of Computer science & engineering, P.R.Pote Engg & management College, Amravati

Abstract: The security of one's belongings when a person leaves his/her house is always a concern with increasing number of incidents of theft, robbery etc. Many automated systems has been developed which informs the owner in a remote location about any intrusion or attempt to intrude in the house. 8051 has been extensively used in past projects. However, We are looking into the development of an ANDROID application which interprets the message a mobile device receives on possible intrusion and subsequently a reply (Short Message Service) SMS which triggers an alarm/buzzer in the remote house making others aware of the possible intrusion. Controlling home appliances remotely with mobile applications have started becoming quite popular due to the exponential rise in use of mobile devices. Mobile handsets today are essentially handheld computers with integrated mobile radio communication capabilities. With increasing usage of GSM, network services are expanded beyond speech communication to incorporate many other custom applications, machine automation and machine to machine communication.

This application can be incorporated with mobile phones is sure to benefit every people who always have a doubt of their belongings being secure in the house in their absence. Most of the mobile devices that are manufactured nowadays in the market are ANDROID OS based. Taking this into interest the application can be developed in ANDROID and made user friendly, thereby making the applications highly robust across different mobile devices and variety of users.

Keywords: ANDROID, Short Message Service (SMS), Global Communication for mobile system (GSM).

I. Introduction

Today we have a tendency to reside in twenty first century wherever home automation is enjoying vital role in human daily-life. Currently a day’s home automation system permits United States to regulate numerous manage appliances like lightweight, door, fan, AC etc. It additionally provides person home security and emergency system to be activated. Home automation not solely refers to cut back human efforts however additionally energy potency and time saving. the most objective of home automation and security is to assist disabled and previous aged folks which can change them to regulate home appliances and alert them in crucial things, we've projected easy, low cost, low power consumption and a unique methodology for implementing the house security mistreatment GSM. Mobile devices are integrated into our existance. Consequently, home automation and security have become progressively outstanding options on mobile devices. we'd develop a security system that interfaces with associate degree humanoid mobile device. The mobile device and security system communicate via Bluetooth as a result of a short-range-only communications system was desired. The mobile application may be loaded onto any compatible device, and once loaded, interface with the protection system. Commands to lock, unlock, or check the standing of the door to that the protection system is put in may be sent quickly from the mobile device via a straightforward, simple to use graphical user interface. the protection system then acts on these commands, taking the acceptable action and causation a confirmation back to the mobile device. the protection system may also tell the user if the door is open. The door additionally incorporates a standard lock and key interface just in case the user loses the mobile device.

A. Motivation

Home automation business has raw sizable attention of the researchers for quite a decade [1]. The main plan is to mechanically management and monitor electrical and electronic home appliances. As per the research firm ABI regarding four million home automation systems were oversubscribed globally in 2013 constant firm additionally calculable that regarding ninety million homes would use home automation systems by the tip of 2017. Many industrial and analysis versions of home automation system are introduced and designed [2-6]. Among these solely home security systems became the most stream of development activities [1] good home systems have captured many technologies to this
point and merchandise are offered within the market. Despite over a decade long of disparate activities within the business firms didn’t create home automation as a preferred technology. The explanations behind this failure are comprehensively studied [1,3], a number of these necessary reasons embody value, troublesome to use, merchandiser dependency, less practicality, and security [1]. Moreover, knowledgeable hand was needed to put in, configure, and maintain these systems. Hence, the installation and maintenance prices of the system were high and solely wealthy folks with huge homes might afford it. so as to beat a number of these limitations like wireless home automation system (WHAS), Bluetooth based mostly Remote observance and management System and we are developing a system which considerable attention in the recent years.

B. Aim

Traditional household security systems often require installation and detect based on opening of doors and windows. The increasing number of the stealing and house breaking cases especially when the people are not at home need a system that can tell them if anyone has attempted or trying to break into their home. Therefore the idea of a smart home system was proposed, to overcome the limitations of the systems already available in the market. The user can choose the number of sensors, types of sensors, the area of coverage of the systems along with the number.

The aim of the project is to implement a smart home system by monitoring home remotely with the help of a mobile device and getting alerts on intrusion or movement around the restricted premises.

C. 1.3 Objective

The main objective is to investigate a cost effective solution that will provide controlling of home appliances remotely and will also enable home security against intrusion in the absence of home owner.

The motivation is to facilitate that home security has been a major issue where crime is increasing and everybody wants to take proper measures to prevent intrusion. As there are various system which are already implemented but still there are some drawbacks which are as follows

1) All developed system is high cost. They are not offer able by every person.

2) It is very difficult to handle.

3) Maintenance is main factor.

4) If the interrupt occurred, installed system send SMS to user but user is unable to reply the SMS in such condition a third person required for replying SMS.

By studying above drawback we will propose an intelligent system which have main objective to overcome the drawback such as

1) Developing a cost effective system.

2) Developing very simple and low maintenance system.

3) If the interrupt occurred, installed system sends SMS to user but user is unable to reply the SMS in such condition an intelligent operating system (Android) will reply SMS. This is main innovative thing. The GSM modem should sends a message to the ANDROID application installed in the mobile device. If the user will fails to response in the defined time period, the application will automatically and successfully sends a default message to the remote device, subsequently trigger the buzzer.

In addition there was a need to automate home so that user can take advantage of the technological advancement. Therefore this is a propose system that allows user to be control home appliances ubiquitously and also provide security on detection of intrusion via SMS using GSM technology.

D. 1.4 Scope

The propose system we can implement because Android OS is currently the lead on mobile market. Most of the mobile devices that are manufactured nowadays in the market are ANDROID OS based. It is very open sources.[3] The home appliances control system with an affordable cost was thought to be built that should be mobile providing remote access to the appliances and allowing home security[10]

II. Literature Review

A lot several Home automation systems square measure offered within the market. Totally different approach has been planned at different times. However, Home automation system victimization mechanical man continues to be in progress scientific research field. Google is making an attempt to hitch home management arena with mechanical man application. The approaches relevant to the subject square measure listed below.

During this topic given by A. Alheraish, Member, IEEE, a style and implementation of remote system by means that of GSM cellular communication network is delineated. This style integrates the device to be controlled, the microcontroller, and GSM Module so it is used for a good vary of applications. The planned M2M style during this uses a computer because the terminal user rather than microcontroller. In such a style, GSM dialup and communication protocol is embedded within the computer. The M2Mmicrocontroller
interacts with the M2M engine, embedded with the SIM card, the knowledge that may be sent to the network has got to be taken to a microcontroller to form the interface between the machine and M2M engine that they had used completely different modules like check and browse message module, which check any received message from the M2M module victimisation AT commands, a decipher module that decodes the text message and excludes all alternative details like date, time and sender’s name.

Nakrop Jinaporn [10] has developed a security system against plus felony by victimisation of proposing a system. The system consists of 5 main parts: (a) RFID reader and tag, (b) GUI, (c) info system, (d) CCTV and (e) wireless transmitter and receiver. The RFID reader is put in at the doorway of the field and also the tags square measure connected on/in student ID cards and their properties. The program of the developed system has the capabilities of investigation them to identification method, management and dominant perform of the hardware.

In this topic given by M. Van Der Werff, X Gui, W.L. Xu, Massey University, New Zealand[3], that they had planned a system consisting of java-enabled portable, a cellular electronic equipment, and a controller board incorporating microcontroller. The portable is a distant management through that a user will move with the house automation system.

Thus, this proposes system can discuss the event of home automation security system that integrates with AN mechanical man mobile device victimisation GPS as a wireless association protocol. Android OS is currently the lead on mobile market share while Symbian OS was already discontinued. This propose System can be incorporated with mobile phones is sure to benefit every people who always have a doubt of their belongings being secure in the house in their absence.

3 Proposed work

The system architecture of the proposed methodology is shown in Figure. A PIR sensor is attached to the door which detects any intrusion attempted by intruders and interrupts the Raspberry Pi to take snapshot using usb camera attached to them. After that Raspberry Pi interrupts the GSM modem and the modem sends pre-configured warnings to the mobile phone in the remote location [9] and also send snapshot as email to user through the internet connection. The user have AUTO SMS ANDROID application in the mobile phone which interprets immediately any incoming message in the message box and triggers a pop-up menu in the mobile screen informing the owner about possible attempt of intrusion in the remote house. If the user acknowledges the pop-up, immediately a message is send back to the remote modem by watching image send by system. The modem sends an interrupt message to the Raspberry Pi so that Raspberry Pi interrupts the buzzer to catch the intruder.

Fig.3.1. System Architecture

Fig. 2. Displays the flow diagram illustration of the planned methodology. The flow diagram offers a transparent plan right from the time the switch detects any interrupt within the door to the top of taking part in the buzzer [8]. The golem application unendingly checks for any incoming SMS within the inbox of the phone. If there’s a brand new incoming SMS, it verifies the
quantity from that the SMS has been received. If the SMS is from the emergency variety, a pop-up screen is straight away flashed within the home screen of the mobile to drive users’ immediate attention. If the user acknowledges the pop-up outlined fundamental measure user conjoinly check email of photograph taken by camera and reply SMS is shipped back to the remote electronic equipment if the person is unknown. If the user fails to acknowledge to the pop-up within the outlined fundamental measure, a default time

or fastened fundamental measure is hoped-for. Once now amount expires, a reply SMS is shipped mechanically back to the remote electronic equipment. this is often done as a result of even though the user fails to acknowledge thanks to bound reasons, the buzzer within the remote place ought to be triggered frightful a couple of potential intrusion

Fig3.2. System Execution flowchart

Result

The screen short of AUTO SMS Mobile application after intrusion is found is as follow

Figure 4.1 Auto SMS Application Home screen
Conclusion

We will be deployed APK (ANDROID Application Package File) file to golem enabled mobile devices and it ought to offer some truthful result as per demand of user. On interrupt intrusion, the GSM electronic equipment ought to sends a message to the golem application put in within the mobile device. If the user can fails to response within the outlined period, the appliance can mechanically and with success sends a default message to the remote device, later on trigger the buzzer. The appliance mentioned here is certain to helpful each folks that continually have a doubt of their belongings being secure within the house in their absence. Most of the mobile devices that ar factory-made today within the market argolem OS based mostly. Taking this into interest we tend to ar aiming to developing application in golem and created user friendly, thereby creating the appliance extremely strong across completely different mobile devices and sort of users.

References


