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Android Mobile App Based Intelligent Home Security System

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Abstract: With advancement of technology things are becoming simpler and easier for us. Automatic systems are being preferred over manual system. This unit talks about the basic definitions needed to understand the Project better and further defines the technical criteria to be implemented as a part of this project several machine-controlled systems has been developed that informs the owner in an exceedingly remote location concerning any intrusion or commit to intrude within the house. 8051 has been extensively utilized in past comes. However, we have a tendency to area unit appearance into the event of AN golem application that interprets the message a mobile device receives on attainable intrusion and after a reply (Short Message Service) SMS that triggers an alarm/buzzer within the remote house creating others conscious of the attainable intrusion. Dominant home appliances remotely with mobile applications have started changing into quite common attributable to the exponential rise in use of mobile devices. Mobile handsets nowadays area unit primarily hand-held computers with integrated mobile radio communication capabilities. With increasing usage of GSM, network services area unit expanded on the far side spoken language to include several alternative custom applications, machine automation and machine to machine communication.

Keywords: Android Mobile App, (Short Message Service) SMS, GSM, AN golem application.

1. INTRODUCTION

Now daily we have planned terribly easy, low price effective, low power consumption system and a intelligent novel methodology for implementing the house security mistreatment GSM. Mobile devices are integrated into our existence. Mobile devices have been integrated into our existence. Consequently, home automation and security have become more and more distinguished features on mobile devices. Home automation and security have become more and more distinguished options on mobile devices. we are able to develop a security system that interfaces with Associate in Nursing golem mobile system device. The mobile device and security system communicate via Bluetooth, wi-fi, NFC as a result of a short-range-only communications system was desired by golem mobile. The mobile applications are often loaded onto any compatible device, and once it 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 are often sent quickly from the mobile device via a straightforward, simple to use 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 can even tell the user if the door is open. The door conjointly incorporates a conventional lock and key interface just in case the user loses the mobile device.

A. Motivation

Home automation trade has drawn goodish attention of the researchers for quite a decade [1].The main plan is to mechanically management and monitor electrical and electronic home appliances. consistent with the marketing research firm ABI regarding four million home automation systems were oversubscribed globally in 2013 [2]. an equivalent firm additionally calculable that regarding ninety million homes would use home automation systems by the top 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 date and merchandise are offered within the market. Despite over a decade long of disparate activities within the trade corporation's didn't build home automation as a preferred technology. The explanations behind this failure are comprehensively studied [1, 3]. a number of these vital reasons embrace price, troublesome to use, merchant dependency, less practicality, and security [1]Moreover, professional 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 individuals with huge homes may afford it. so as to beat a number of these limitations like wireless home automation system (WHAS),Bluetooth based mostly Remote watching and management System and we have a tendency to square measure developing a system that goodish attention within the recent years.

B. Objective

The main objective is to research a value effective resolution which will offer dominant of home appliances

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remotely and can additionally alter home security against intrusion within the absence of home owner.
The motivation is to facilitate that home security has been a significant issue wherever crime is increasing and everyone needs to require correct measures to stop intrusion. As there area unit numerous system that area unit already enforced however still there area unit some drawbacks that area unit as follows

1] All developed system is high value. they\'re not providing ready by one and all.
2] It is terribly tough to handle.
3] Maintenance is main issue.
4] If the interrupt occurred, put in system send SMS to user however user is unable to reply the SMS in such condition a 3rd person needed for replying SMS. By learning higher than disadvantage we are going to propose an intelligent system that have main objective to beat the downside like
5] Developing a value effective system.

Developing terribly easy and low maintenance system.
If the interrupt occurred, put in system sends SMS to user however user is unable to reply the SMS in such condition Associate in nursing intelligent software package (Android) can reply SMS. This is often main innovative factor.

The GSM electronic equipment ought to sends a message to the robot application put in within the mobile device. If the user can fails to response within the outlined fundamental measure, the appliance can mechanically and with success sends a default message to the remote device, afterwards trigger the buzzer The propose system we are able to implement as a result of robot OS is currently the lead on mobile market. Most of the mobile devices that area unit factory-made these days within the market area unit robot OS primarily based. It is terribly open sources.
The house appliances system with an inexpensive value was thought to be designed that ought to be mobile providing re- molecule access to the appliances and permitting home security additionally there was a desire to alter home so user will benefit of the technological advancement. thus this is often a propose system that enables user to be management home appliances ubiquitously and additionally offer security on detection of intrusion via SMS exploitation GSM technology.

2. LITERATURE REVIEW

A lot of several Home automation systems area unit out there within the market completely different approach has been planned at different times. However, Home automation system victimization golem remains current scientific research field. Google is making an attempt to affix home management arena with golem application. The approaches relevant to the subject area unit listed below. During this topic bestowed by A. Alheraish, Member, IEEE, a style and implementation of device 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 will be used for a large 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 data which will be sent to the network needs to be taken to a microcontroller to create the interface between the machine and M2M engine. they\'d used completely different modules like check and skim message module ,which check any received message from the M2Mmodule victimization AT commands, a decipher module that decodes the text message and excludes all alternative details like date, time and sender\'s name.
NakropJinaporn [10] has developed a security system against quality larceny by victimization frequency identification technology. The system consists of 5 main parts:
(a) 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 area unit hooked up on/in student ID cards and their properties. The program of the developed system has the capabilities of investigation the identification method, management and dominant operate of the hardware. In this topic bestowed by M. Van Der Werff, X Gui, W.L. Xu, Massey University, New Zealand [3], they\'d planned a system consisting of java-enabled mobile, cellular electronic equipment, and a controller board incorporating microcontroller. The mobile is a foreign management through that a user will act with the house automation system. Thus, this proposes system can discuss the event of home automation security system that integrates with AN golem mobile device victimization GPS as a wireless affiliation protocol. Golem OS is presently the lead on mobile market share whereas Symbian OS was already interrupted. This propose System will be incorporated with mobile phones is certain to profit each folks that forever have a doubt of their belongings being secure within the house in their absence.

3. PROPOSED WORK

The diagram of the projected methodology is shown in Fig. 1. A switch is hooked up to the door which detects any intrusion tried by intruders and interrupts the 8051 microcontroller. The 8051 interrupts the GSM electronic equipment and therefore the electronic equipment sends pre-configured warnings to the portable within the remote location [9].

The robot application pre-loaded within the portable interprets straightaway any incoming message within the message box and triggers a pop-up menu within the mobile screen informing the owner concerning attainable try of intrusion within the remote house. If the user acknowledges

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the pop-up, straightaway a message is challenge to the remote electronic equipment. The electronic equipment sends associate interrupt to the microcontroller and therefore the microcontroller interrupts the buzzer

Fig. 2. Displays the flow sheet illustration of the projected methodology. The flow sheet provides a transparent plan right from the time the switch detects any interrupt within the door to the tip of taking part in the buzzer [8].

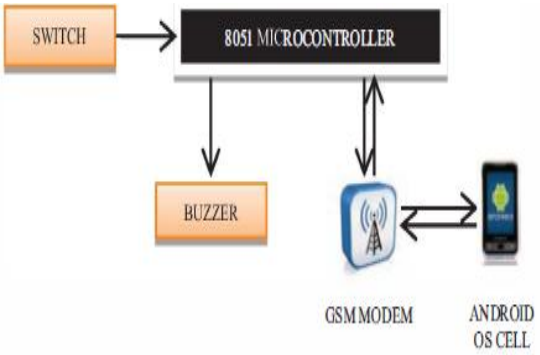

Fig. I. Basic block diagram of the system

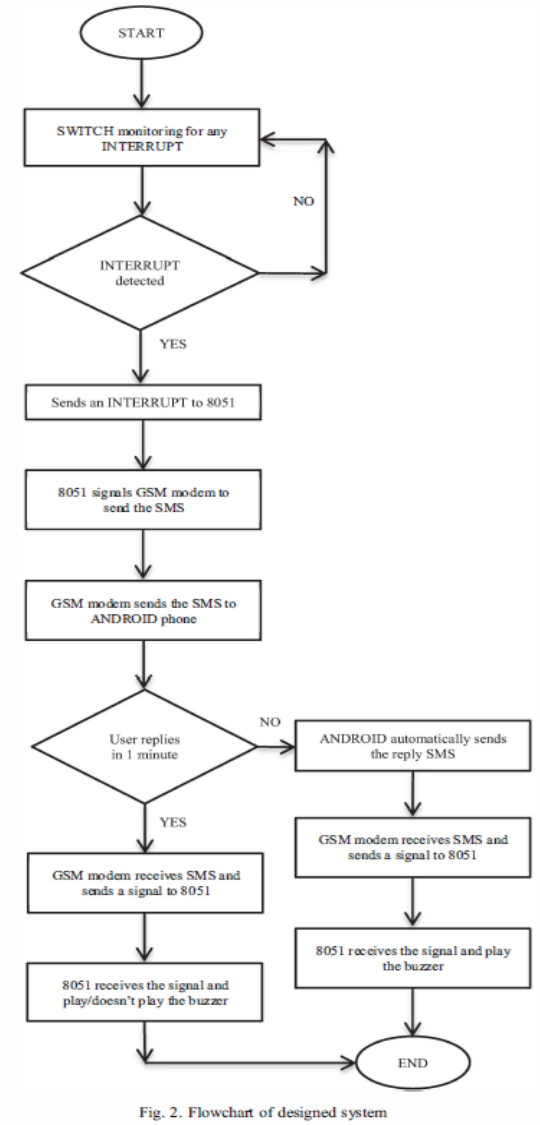

Fig. 2. Flowchart of designed system

The robot application ceaselessly checks for any incoming SMS within the inbox of the phone. If there\'s a replacement incoming SMS, it verifies the amount from that the SMS has been received.

If the SMS is from the emergency range, a pop-up screen is instantly flashed within the home screen of the mobile to drive users\' immediate attention. If the user acknowledges the pop-up in outlined period, a reply SMS is distributed back to the remote electronic equipment. If the user fails to acknowledge to the pop-up within the outlined period, a default time or mounted period is hoped- for. Once now amount expires, a reply SMS is distributed mechanically back to the remote electronic equipment. this is often done as a result of although the user fails to acknowledge as a result of bound reasons, the buzzer within the remote place ought to be triggered alarming a couple of attainable intrusion.

4. HARDWARE IMPLEMENTATION

ADK stands for Accessory Development Kit. Android accessory is a physical accessory that can be attached to your Android device. These particular devices perform specific actions. For USB accessories to be supported on a particular device, there must be support for the accessory-mode, a special means of connecting over the USB port. This allows data transfer between devices and external peripherals.

The Android Open Accessory Development Kit (ADK) is a reference implementation of an Android Open Accessory, based on the Arduino open source electronics prototyping platform. The accessory's hardware design files are provided as part of the kit to help hardware builders get started building their own accessories.

The Arduino ADK is a microcontroller board based on the ATmega2560. It has a USB host interface to connect with Android based phones, based on the MAX3421e IC. The main hardware and software components of the ADK include ‘Arduino Mega ADK’, which was designed to work with Android. The ‘Arduino Mega ADK’ board is a derivative of the ‘Arduino Mega 2560’. The host chip allows any USB device to connect to the Arduino which we will later implement as an Android USB accessory.

The ADK board provides input and output pins that you can implement through the use of attachments called "shields."

With an Android device and the ‘Mega ADK’, you can use whatever sensors and actuators you require to create your own accessories. This may include a LED outputs, and temperature and light sensors.

describes the hardware implementation of the system. The circuit is designed in the simulation software; MultiSim version 1 1 .00 developed by the software company National Instruments. In the initial phase the simulation was carried out using MultiSim. The wired circuit diagram shown in Fig. 5. is the simulation of the system. During the simulation we integrated the MAX232 IC and GSM modem (GSM modem IC unavailable in MultiSim; direct

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implementation was carried out during real-time hardware implementation) separately. But in real-time synthesis of the system the MAX232 IC was built-in with the GSM modem implying no separate use of MAX232 IC in real-time system. The real time system images (parts of real time system) . and the complete real-time system is shown in Fig. 4.The methods designed in Flowcharts were properly implemented in this phase. The SWITCH monitors for any kind of INTERRUPT and signals the 805 1 microcontroller (in this case the development board P89V5 1 RD2) shown in Fig. 4. The microcontroller in turn sends a digital signal (since microcontroller understands only TTL logic) [1] to the GSM modem which is received by the MAX232 IC incorporated inside the GSM modem and converts it into an analog signal (since GSM modem; model number: SIM900; can only process analog signals) [2].

The GSM modem then sends a SMS to the user mobile phone (preferably supporting ANDROID OS) signaling that an intrusion has occurred. The SMS is then processed upon by the ANDROID application. When a proper reply is received at the modem again; depending upon the SMS the GSM modem will send a specific signal whether to play or do not play the buzzer (If YES is received; buzzer is not rung. Else if NO is received; buzzer is rung).

5. ANDROID APPLICATION IMPLEMENTATION

```
public class DemoClass
{
   private int x;

   public DemoClass()
   {
      // assign default value
      x = 0;
   }

   public DemoClass(int x)
   {
      // use this.x to refer to the instance variable x
      // use x to refer to a local variable x (more specifically,
      // method parameter x)
      this.x = x;
   }
   public DemoClass(DemoClass otherDemo)
   {
      // copy the value from the otherDemo
      this.x = otherDemo.x;
   }
   // static method (aka class method)
   public static void s1() {
      return;
   }
   // instance method
   public void i1() {
      return;
   }
   // static calling static OK
   // static calling instance is a compile-time error
   public static void s2() {
//       i1();     // compile-time error
      s1();      // DemoClass.s1
      return;
   }

   // instance calling static OK
   // instance calling instance OK
   public void i2() {
      s1();      // DemoClass.s1();
      i1();      // this.i1();
      return;
   }
   // call various versions of overload() based on their
   // list of parameters (aka function signatures)
   public void overloadTester() {
      System.out.println("overloadTester:\n");

      overload((byte)1);
      overload((short)1);
      overload(1);
      overload(1L);
      overload(1.0f);
      overload(1.0);
      overload('1');
     overload(true);
   }
      public void overload(byte b) {
      System.out.println("byte");
   }
   public void overload(short s) {
      System.out.println("short");
   }

   public void overload(int i) {
      System.out.println("int");
   }
   public void overload(long l) {
      System.out.println("long");
   }
   public void overload(float f) {
      System.out.println("float");
   }
   public void overload(double d) {
      System.out.println("double");
   }
   public void overload(char c) {
      System.out.println("char");
   }
   public void overload(boolean b) {
      System.out.println("boolean");
   }
   public static void main(String[] args) {
      DemoClass dc = new DemoClass();
      dc.overloadTester();
   }
}

// end of DemoClass.java
```

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6. CONCLUSION

The APK (ANDROID Application Package File) file have been deployed to ANDROID enabled mobile devices and tested. The hardware circuit meant to detect intrusion is installed. On interrupti intrusion, the GSM modem successfully sends a message to the ANDROID application installed in the mobile device. If the user fails to response in the defined time period, the application successfully sends a default message to the remote device, subsequently triggering the buzzer.

The application discussed here 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 has been developed in ANDROID and made user friendly, thereby making the application highly robust across different mobile devices and variety of users.

Certain features like triggering an electronic lock remotely rather than simply triggering the buzzer might be more useful to the users and will surely be taken care of in the near up gradation of the complete application. Also the system may be turned into a complete Home Automation System by implementing different sensors e.g. Motion Sensors, Gas Sensors, Temperature Sensors, etc. in the near future.

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