



Wireless Automatic Home security using Cloud Computing and Arduino Micro- Controller

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ABSTRACT: Home security is essential for the occupants' convenience and protection. At entry point the system should be secured this is the main purpose to design this system. This paper aims to develop a low-cost means of the home security using the sensors like motion sensor, PIR sensor etc. This system also deals with the Bio-metric Scanning used as entry password for user. Data from all these sensors is continually received and processed by Arduino Uno board which acts as a Microcontroller unit. In case of unanticipated situations, the Arduino will raise an alarm and alert message will be sent to the user's mobile via 3G and user interface connected to the cloud which allows to file detail a system that would let the users to store their finger print in the cloud, the prints would be recorded on the device and can be accessible from any other with an appropriate biometric sensor. It prevents having to record prints on multiple devices for multiple users. Thus the system ensures home safety as well as security wirelessly.

KEYWORDS: Bio-metric scanners, User Interface (Android Application), 3G (Third Generation cellular telephony), RMN (Register mobile number), Cloud storage, Arduino Uno.

I. INTRODUCTION

This system helps to protect the home especially entry point of the home from burglars and crooks. At the current situation all the industries, banks or organizations use the security to protect their premises from burglars. Home automation means the automated home i.e. controlling the lighting appliances, Air-conditioning appliances and other electrical and electronic devices over the 3G enabled phone. We are making this possible i.e. home security as well as automation using Arduino micro-controller. In this system while developing security section we concentrate on entry point of the home i.e. entry gate or Door. We gave the access to the user who has the User Interface (Android application) with the Bio-metric scanner which scans for the user's Finger print which is already registered in the system. In automation section we can control lights of our home using the User Interface that sends the signals to the system. This paper is based on the embedded system where micro-controller is used for Automatic Home security system.

This system is to implement a microcontroller-based control module that receives its instructions and command from the User Interface through a cellular phone over a 3G network and data stored at cloud. The microcontroller will then carry out the commands and then communicate the status of the given application or device back to the User Interface through the cellular phone.

II. LITERATURE REVIEW

As per our survey currently there exists system neither at cheaper rates nor easy to handle. Various systems are hard to install, difficult to use and maintain. Current systems are generally proprietary, closed and not very user friendly. Based on Arduino or 3G or low cost Home security system we discuss this system in detail as below:

a. Advanced low cost security system using sensors, Arduino, User Interface and GSM Communication module:-

In this importance of the home security measures are elaborated using easily available programmable sensors like PIR sensors. The also helps in the variations and also low maintenance cost. Digital signal processors and finger print are added to the security system that will eliminate the ambiguity in the system. User Interface is with the Ethernet servers Using the HTTPS internet website, so communicate with the system from anywhere. This is also versatile and brings down the operation cost.



Figure 1(arduiono board)

b. Automation using Arduino Uno:-

In this system we required Uno, Wi-Fi module. By connecting all connection correctly and applying a simple C or C++ code on Arduino. Sensor senses the motion so that it will give an alert to user. User can control the system by User application.

c. GSM based Control system:-

The extensive capabilities of this system are what make it so interesting. From the convenience of a simple phone, a user is able to control and monitor virtually any electrical device. This makes it possible for the users to rest assured of their belongings and make sure that electrical appliances are not running when they are not in house.

d. Implementation of low-cost automatic home security:-

The home automation system has been experimentally proven to work satisfactorily by connecting sample appliance were successfully controlled from a wireless mobile device. The WI-FI client was successfully tested on different mobile phones from different manufactures, thus proving its portability and wide compatibility.

III. PROPOSED WORK

There are two separate stages involved in using a system like this. First you have to go through a process called enrollment, where the system learns about all the people it will have to recognize each day. During enrollment, user's fingerprints are scanned, analyzed, and then stored in a coded form on a secure database and cloud storage. Typically it takes less than a half second to store a person's prints. The proposed Security systems can also include motion Sensors that will detect any kind of unauthorized movement and will alert the user by sending the notification through the user interface. Scope of this project can be expanded to many areas by not restricting it to only home. The System is flexible in supporting to various Technologies namely wireless technologies like GSM module, Bluetooth, World Wide Web i.e. WWW.



IV. METHODOLOGY

The system is basically segregated into two sections, the first part deals with the security related mechanism for the system, and the other deals with the automation. In security all the efforts are made for which the system can be secured. In the automation part of the system all the techniques and method for ease of operating is handled. The security system made is generally mounted at the entry point of the system. The home or the user has the bio metric. In case if the user has lost the mobile or in the case of any emergency the user can login to the user application using another device which is having the appropriate bio metric scanner and control the system .

a. Algorithm for Finger-print:-

1. Accept the user's finger print.
2. Convert the taken print into coded form.
3. Store the coded form in the phone storage and cloud.
4. If it matches with the stored scan then the user will get the entry else can't.
5. If any person attempt to enter in home with more than three time wrong scans then at that time camera module will be Activate. And camera module will capture the image of person who trying to attack on system and alert the user and the specified authority.

b. Software Requirements :-

Arduino Environment ARDUINO 1.6.1:-

It is the open source software (IDE) makes it easy to write code and upload it on the microcontroller Board. It runs on various platform s like Windows, Mac OS and Linux. The environment is written in Java and it is based on other open source software. Arduino programs are written in C/C++.

c. Hardware Requirements:-

- i. Arduino Uno
- ii. Different Sensors
- iii. 3G module
- iv. Mobile Phone (GSM phone with finger print scanner)
- v. Cloud storage.

i. Arduino Uno :-

The Uno is a microcontroller board based on the ATmega328P. It has 14 input/output pins, 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. Simply connect it to a computer with a USB cable or power it with an AC to DC adaptor or a battery to start it.

ii. 3G module :-

The third generation of cellular telephony refers to a combination of technologies that provide a variety of services. This is a very low in cost and it is a simple Arduino 3G-Shield. We use the module SIM808 GSM / GPRS / GPS 3Gshield for Arduino. It's cheaper module now available in the market.

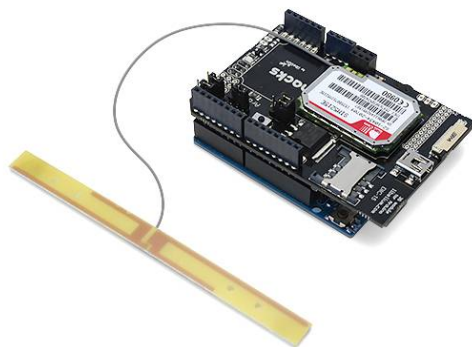


Figure II. (3G module)

iii. Cloud Computing :-

The Bio-metric Scanning used as entry password, file detail a system that would let the users to store their finger print in the cloud, the prints would be recorded on the device and can be accessible from any other with an appropriate biometric sensor. It prevents having to record prints on multiple devices for multiple users. Using cloud there is less potential to be accessed by the hackers.

V. PROBLEM FACED

In this system the 3G-shield is very important part for communication between mobile phone and microcontroller. 3G shield requires the SIM card, due to range fluctuation or busy network sometimes 3G-shield will not work properly.

VI. CONCLUSION

In this paper, a novel architecture for low cost and flexible home security and monitoring system using Arduino microcontroller is proposed and implemented. Overall Arduino is easy to understand & its coding is easy. By implementing this type of system we can secure Entry point of our Home asWell as for more security we can use various sensors.

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