AUTOMATED HOME DOOR LOCK SYSTEM

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Abstract— Now-a-days maximum of the people are out of their house for business, college, office work etc.Their home remains locked for the whole day.So, there is a need for home security which can make sure that your home is safe and can't be opened without you and your family members.
The proposed system uses android application that runs on mobile phones for door locking and unlocking.The application will be installed on mobile device and will be connected to the door latch through the bluetooth.This application will increase the security of the house.They can even keep their valuables in home instead of using alternative such as bank lockers.Using this application, people will feel that they made their home more secured and can relax and enjoy their outing being tension free.

Keywords—**Android,Bluetooth,Webcam,Drop box,password.**

I. INTRODUCTION

With rapid development of information technology, the level of capability of smartphones is remarkable and continues to grow. As mobile communication technology has developed , the mobile device has starting playing a very important role in daily life and it is in great public demand.Therefore why not used this as a device to lock and unlock the doors without using door lock keys[1].This is one way of utilizing the application of mobile technology for replacing an old-age manual security of having lock and keys.This is an added feature to the use of mobile phone as the primary key to open the door only by the authorized family member.
The traditional method of door locking used a key that can be easily opened by an unauthorized person since breaking a physical lock is a common thing.This will allow them to steal the entire valuable things from the house.The major issue with people today is how to manage keeping their valuable things at home when they are out for some reason. Besides that,sometimes family members cannot enter the home because they don't have door keys.They have to wait till the person having the key comes.The proposed system aims to solve this problem by using an android application that runs on mobile phones.The application will be installed on mobile device and will be connected to the door latch through the bluetooth.This application will provide more security than the traditional locking system.
The android application will contain the user identification phase in which the user has to enter the password in order to unlock the door.This password will be known only to the family members.If the password is correct then the motor will start rotating,and the door latch will be opened.Sms regarding the same will be received by the owner of the house and an image of the person unlocking the door will be captured by the webcam and will be stored in drop box folder of user.

II. FEATURES

The features of Automated Door Lock System are as follows:
2.1 Easy Access: This feature allows the user to lock and unlock the door by using mobile.
2.2 Security: This feature provides detection of unauthorized movements or actions and sends notification to the user.
2.3 User Friendly: This system is easy to use as it asks the user to enter password only.

III. LITERATURE SURVEY

4.1.Smart digital door lock for the home automation
In this System,a smart digital door lock system for home automation is proposed. In the proposed system, a ZigBee module is embedded in digital door lock and the door lock acts as a central main controller of the overall home automation system.
The proposed system is the network of sensor nodes and actuators with digital door lock as base station. A door lock system proposed here consists of RFID reader for user authentication, touch LCD, motor module for opening and closing of the door, sensor modules for detecting the condition inside the house, communication module, and control module for controlling other modules. Sensor nodes for environment sensing are deployed at appropriate places at home. Status of individual ZigBee module can be monitored and controlled by the centralized controller, digital door lock.

As the door lock is the first and last thing people come across in entering and leaving the home respectively, the home automation function in digital door lock system enables user to conveniently control and monitor home environment and condition all at once before entering or leaving the house.It also allows users to remotely monitor the condition inside the house through Internet.

Advantage

It can be easily installed when and where necessary without requirement of any infrastructures and proper planning.

Disadvantage

The proposed system has a complex structure.

2.1.2.Access Control Using Biometrics Features with Arduino Galileo

In this System,a new efficient home automation security based on multimodal biometrics is proposed.The multimodal biometrics there is a combination of different biometric modalities into a single system. The proposed system used the fingerprint and voice as a biometrics features for authentication to access control to the home.This system consist of two parts: first part is the hardware system components and the second part is the proposed system method. The hardware section includes the Arduino Galileo form Intel, fingerprint shield, EasyVR 2.0voicerecognition shield, GPRS/GSM shield. The goal of this project is to increase the security access control by using multimodal biometrics.

Advantages

-The multimodal biometric system overcomes the limitations of unimodal biometric system.

-It reduces fraudulent access and also provides more accuracy than unimodal.

Disadvantages

-The use of fringerprint as a biometric measure is not appropriate with children, because the size of their fingerprint changes quickly.

-It can make mistakes with the dryness or dirty of the finger's skin, as well as with the age.

2.1.3.Automated Door Accessing System With Face Recognition

This System proposes three main sub systems namely face recognition, face detection and automatic door access control. The face recognition and detection process is implemented by modifying principal component analysis(PCA) approach to fast based principal component analysis (FBPCA)approach, by which the captured image is detected using a web camera and compared with the image in the database. If the image is an authenticated one the door will be opened automatically else an SMS will be generated using a GSM modem to the user that an unauthorized person has Entered home.

Advantage

-Proposed system provide security on detection of intrusion via SMS using GSM technology.

Disadvantages

-Need to maintain a database which contains face images of authenticated users.

-Web camera comes a pre-requisite.

2.1.4.Access Control of Door and Home Security by Raspberry Pi Through Internet .

In this system, a system is being developed to connect any door with the internet, so that the access control system can be controlled from any where in the world. In a case that one is not at home and a vistor is at his door steps then the authorized person will be notified about the visitor via twitter and the person can see the visitor from the web through the camera from any where and the system will take a picture of the visitor and keep a record by sending an attachment through E-mail or tweet in twitter. If the authorized person wants to give a message the visitor it can be sent easily through the internet and it will appear in a screen on the front face of the door. The door lock can be controlled through the internet.

Advantages

-The system keeps a picture of the visitor as evidence that would be needed if any unwanted situation occurs like stealing, robbery etc.

-The user can control the door with a single command through the internet by using mobile, pc, tablets etc.

Disadvantages

-The setup is costly.

-Internet connection is a must.

-Web camera is required.If it is not working,the user won't be able to see the visitor.

IV. ISSUES IN EXISTING SYSTEMS

The traditional method of door locking used a key that can be easily opened by an unauthorized person since breaking a physical lock is a common thing.This will allow them to steal the entire valuable things from the house.The major issue with people today is how to manage keeping their valuable things at home when they are out for some reason. Besides that,sometimes family members cannot enter the home because they don't have door keys.They have to wait till the person having the key comes.

V. BLOCK DIAGRAM

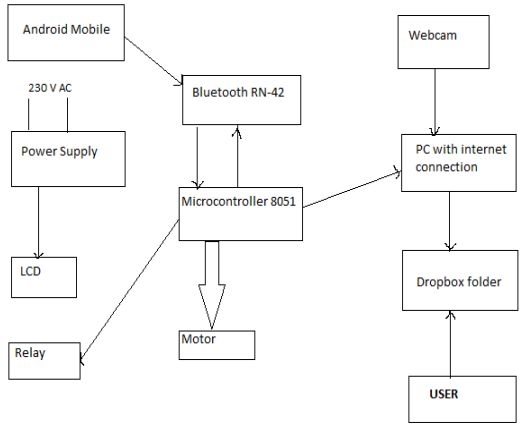

Fig:block diag of automated door lock system

VI. COMPONENTS OF AUTOMATED DOOR LOCK SYSTEM

3.1.POWER SUPPLY

This unit will supply the various voltage requirements of each unit. This will be consists of transformer, rectifier, filter and regulator. The rectifier used here will be Bridge Rectifier. It will convert 230V AC into desired 5V/12V DC with maximum current rating 500mA.

3.2.MICROCONTROLLER:

Microcontroller is nothing but a combination of all the peripheral components that are required for proper execution of a computer system , encapsulated in a single chip. In simple words:

1. It is single chip computer.
2. It has in built code and data memories.
3. It has in built serial and parallel ports.
4. It has capability of uploading , storing, and running a program or a instruction

It is unit the heart of complete system. It is actually responsible for all the process being executed. It will monitor and control all the peripheral devices or components connected in the system. In short we can say that the complete intelligence of the project resides in the software code embedded in the Microcontroller.

An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints

The controller here user will be of 8051 family. The code will be written in Embedded C and will be burned or programmed into the code memory using a programmer.

This requires +5V DC for it proper operation.

3.3.LCD 16X2:

It is called Liquid Crystal Display. LCD's operate on the principle of light scattering. LCD's are passive display having low power consumption We are going to use 16x2 character LCD. Display size: 16 character * 2 lines.

This will be connected to microcontroller. The job of LCD will be to display all the system generated messages coming from the controller. LCD will provide interactive user interface.

3.4.DC MOTOR DRIVER:

This unit is nothing but H-Bridge driver encapsulated in a single IC. Here we will use L293D IC for DC motor driving. It can drive up to 4 DC motors in unidirectional mode and 2 DC motors in bidirectional mode. It can sink up to 600mA per channel.

The job of this unit is to drive the connected motors in desired direction when microcontroller sends signal to their respective channels.

This unit requires +12V DC for its operation.

3.5.BLUETOOTH MODEM:

This is the non-HID RN-42 module from Roving Networks, a powerful, small, and very easy to use. This Bluetooth module is designed to replace serial cables. The Bluetooth****stack is completely encapsulated. The end user just sees serial characters being transmitted back and forth. Press the 'A' character from a terminal program on your computer and an 'A' will be pushed out the TX pin of the Bluetooth module.

The RN-42 is perfect for short range, battery powered applications. The RN-42 uses only 26uA in sleep mode while still being discoverable and connectable. Multiple user configurable power modes allow the user to dial in the lowest power profile for a given application.

3.6.GEAR MOTOR:

This unit is nothing but H-Bridge driver encapsulated in a single IC. Here we will use L293D IC for DC motor driving. It can drive up to 4 DC motors in unidirectional mode and 2 DC motors in bidirectional mode. It can sink up to 600mA per channel.

The job of this unit is to drive the connected motors in desired direction when microcontroller sends signal to their respective channels.

This unit requires +12V DC for its operation.

VII. CONCLUSION

The traditional way of door lock using lock and keys are no more reliable. As now-a-days android mobile has become a basic need for every individual. By taking advantage of this we have designed a system which uses android phone to operate door locking system.

The proposed system can be used in home safety which will enhance the security of the home door.It can also reduce the robbery cases that is increasing day by day using traditional lock system.

In future technology will grow then the proposed system using bluetooth can be replaced by some advanced technology which will provide easy connectivity of the mobile phones and the door and also allow to open the door remotely.

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