

SURVEY ON DOOR AUTOMATION SYSTEM USING PIN AND FINGERPRINT BY SMARTPHONE

Mrs.Mariya Joseph

Mr. Yohannan Alias
Mr. Jomish T John
Dept of CSE
MBC CET
Kerala,India

Ms.Sijimol A S

Dept of CSE
MBC CET
Kerala,India

Abstract— Door automation is the implementation of information technology and control system to facilitate the daily life easier. The growth of technology make smartphone can control the home appliances. An automated device can work more flexible and efficient in unlocking door. For busy family or busy people, it is not easy to get out of the seat only to reach the door for unlocking people that already have known and made appointment before. Sometimes the key holder may come late or other members may come early, so a door automation system which can access anywhere from the world may be an ideal solution for this. The proposed system presents friendly expense design and implementation of door automation to unlock the door with authentication through fingerprint or pin code via Smartphone application. So it is not only the open button from smartphone android application that anyone can control, but also it is added an interface for fingerprint or pin code which also can be useful as security. Users can change the password used by themselves. Thus, only users who know the password can control to unlock the door. The smartphone android application designed facilitates the users to be free to choose the authentication between fingerprint or pin code. In fingerprint, users can easily open the door as well as close the door. Another work being tried is open the door with pin. The design of proposed method is based on Android Smartphone application, Arduinochip, Nodemcu and Cloud database.

I. INTRODUCTION

There are many possible approaches towards the sophisticated technologies. Door automation is one of revolutionary technology nowadays. Toward realizing home automation, home appliances are made as easy as possible to be controlled by user. Several work of controlling home appliances have been done, such as turn on the lights, fan, even also open the door via smartphone that is controlled by on off button, open button or short messages service . Besides controlling, door automation can be implemented in profitable way by adding security that will help people to increase the quality of life. Moreover, nowadays every one already has Smartphone and more aware of the existence of the smartphone. No more forget to bring the key, forget to put the key and no need to duplicate a lot

of key for each member, but still keeping in mind the key security level. Sometimes it is hard to move from the seat when already concentrate on work only to lock or unlock the door far from the place. So it will easy to open or close the door without movement from the seat. The user can easy understand of these new concepts in the daily life Smart devices have been used with various approaches to control home appliances. Here, the use of smart devices is made not only to simplify, but also to give a simple authentication to open the door with more friendly by using fingerprint and also by using pin codes. Both of them can be used as additional security. So, although the smartphone android application is held by other people, it still cannot use to open the door.

Only people who know the password can open the door, both using fingerprint or pin code method. The development of the mobile android application and the home automation are also use various wireless technology with more intelligent processes. In wireless technology based home automation system several approaches deployed such as, Global System for Mobile (GSM), General Packet Radio Service (GPRS) , Infrared, Wireless Fidelity (Wi-Fi) and Bluetooth . These all wireless technology have their own advantages and disadvantages to be applied. From those wireless technology, Bluetooth can be easily integrated into new device and also has effective cost .So it is not only the open button from smartphone android application that anyone can control, but also it is added an interface for fingerprint or pin code which also can be useful as security. The wi-fi and Bluetooth module can be accessed only from nearby of device but using the cloud and internet we can have it from anywhere of the planet. So besides Smartphone application and Arduino board, the design of proposed method is also based internet explosion using cloud. The feature of the proposed system is not a touch screen button that can easily

open the door without any authentication, so that everybody can open the door with once touch. For make it more safe, the security is added.

The authentication is using fingerprint or pin code. Users can choose one of it from the android application. The user side is provided with application software. The user predefines the fingerprints and pin code which the device only need to recognize. Only this user can add, remove or edit the predefined data value. The values or dataset predefined by the user is stored in the cloud. If a user tries to access the device he needs to authenticate. He or she needs give their fingerprints or pin codes. These authenticating values are compared with the data set stored in cloud. If it matches, it gives permission and if it is not it denies. The permission and denial from the cloud is accessed by using Nodemcu. The internet access for this is given by the Wi-Fi module of Arduino uno. From the arduino uno the signal reaches the relay and to lock system. Multiple doors can be accessed simultaneously if it is connected in same router.

II.RELATED WORKS

A.Smart Home Automation System using IR, Bluetooth, GSM and Android

In this paper a home automation system that uses IR remote, Bluetooth and GSM to control AC appliances using android app is introduced that is easy to use over the traditional method of the switch. The main characteristic of home automation system is remote monitoring and access the home appliances and systems. The appliances i.e. ON/OFF wirelessly on an android application over long distance.

Home automation is also known as domotics.

This involves the control and automation of lighting, heating, ventilation, air conditioning, security. It helps to obtain several factors such as convenience, energy efficiency and safety benefits

It uses Bluetooth and GSM for interaction between android mobile application and the appliances under the control of system. Command and control home gadgets using mobile phone, people can use this system to control devices in their home from a great distance before they reach home.

The user sends a instruction in form of SMS to control a device/appliance from his/her mobile phone to a computer which is connected to the appliance. Once the message is received the computer will send the command to a microcontroller for controlling the appliance properly.

B. Home Automation Using Web Application And Speech Recognition

It propose a web application using which the home appliances can be controlled over internet. The important feature of the device is it can be accessed by anyone who is connected to the home LAN can access the device.

The door locks can be controlled by using voice commands.

For command processing natural language processing are used. Uses wifi module.

The main advantages of home automation using web application is increased range and voice command features provide easiness. As similar as advantages there are so many limitation they are Multiple access may cause confusion for the device and Voice command is not that much efficient etc.

C. Smart Home Automation With A Unique Door Monitoring System For Old Age People Using Python, OpenCV, Android and Raspberry pi

In this paper, smart home automation system is based on python, OpenCV, raspberry pi and android application. The appliances

are controlled by the Raspberry pi server, which operates according to the user command (touch or voice) received from the mobile phone.

A unique door monitoring system is designed based on face detection and recognition from a camera installed outside the main door, which can be accessed from the phone using android application. User can also control the intensity of light as well as the speed of the fan. The home appliances are controlled by Raspberry Pi through user command in form of touch or voice received from the mobile phone.

For wireless connection, Wi-Fi router is used that is connected with raspberry pi through Wi-Fi dongle and phone with Wi-Fi connection. One will control different appliances from the android application by giving command to the raspberry pi and according to command Raspberry pi will give signal to relay switching circuit to turn ON/OFF particular Electrical appliance. In door monitoring system, there is one camera installed on the main door, which is connected to raspberry pi and can be accessed from the phone using android application.

D. Blockchain Based Smart Door Lock System

Smart Door Lock system has widely been used as a major part of home security system. To improve these security issues, this system proposed a Smart Door Lock system based on blockchain.

Blockchain: The blockchain is a distributed database of records or public ledger of transactions that have been executed and shared among participating parties. Each transaction in the public ledger is verified by Consensus of a majority participants in the system. Once entered, information can never be erased and it is called Data Integrity.

Authentication is that Each transaction is digitally signed using the private key of the participant that made the transaction. A blockchain based Smart Door Lock system that can guarantee Data Integrity and Authentication. The nodes which are present on the blockchain network form Peer to Peer network. In (n+1) mining round, all nodes in the blockchain network try to create a (n+1) block and broadcast it. After that, the first received block is added to their chain. Since all transactions in the block are unchangeable, data integrity is guaranteed by implementing the proof-of-work

E. Smart Door System For Home Security Using RaspberryPI3

Wireless network is one of the technologies that have been used to provide remote monitor and control for the home appliances. Electronic door lock systems are one of the most popular security systems that is being installed for many business places. This paper aims to propose a security door lock system based on Raspberry pi. Here we are mainly using camera keypad and pi-lid to provide an alarming system that has the ability to notify the owner, as well as, recognizing guests by giving them a user-id.

In this system, the authorized individuals are only the ones who will get the permission to access the doors. It mainly works by taking snaps for the guest through a code and camera pi positioned in the doors and then such snaps will be sent to the owner. The key characteristic behind such systems is the authorized individuals can gain the permission to access the doors throughout a secure system that has an interactive interface.

F. Door Automation System For Smart Home Implementation

This system proposed the implementation of a pneumatic door automation system intended to be used for access control in smart homes. The structure of the developed application is mainly by PIC 16F877A microcontroller which operates together with a pneumatic actuator based on a double acting cylinder controlled through an air distributor with solenoid valve. Basically door opening and closing actions can be initiated manually by the user, through password authentication

The main parameters of the system can be configured locally, but an in-depth diagnosis and reconfiguration can be performed only through the serial interface which ensure the communication between the main module of the system and an external PC. The door automation module can be integrated in a centralized access control system dedicated to the smart homes that has all the appliances and other electricity based equipment connected into a local network

In this smart home concept mainly refers to a building that contains a particular type of automation system that is specifically implemented and dedicated for controlling the operation of the appliances, equipment and installations existent in that a residential environment. These kinds of systems integrate a variety of sensors and devices and usually use a communication network for internal and external information exchange. It can either local or remote control.

G. Home Automation System With Android Application

This work demonstrates a simple home automation system that allows the user to control home appliances through wireless. In this system, the controlling and monitoring the appliances can perform in two methods. The first method is through a web server meanwhile the second method is by using Smartphone based on Android application.

This web interface has framework known as Restful Api. Both of the methods include restful api, it is included in the web interfaces but it added additionally for the android application. The communication between the Smartphone and the Raspberry Pi board is wireless. The system is proposed to create a smart environment by switching on and off the target devices by Wireless-Fidelity (Wi-Fi).

H. The Prototype Of Automated Doors And Windows By Using Voice Command

In this system the voice command is used to control doors and windows by using a smartphone. The command is delivered by using a smartphone feature like a bluetooth. The bluetooth command is then translated by arduino to move the actuators to control the doors and the windows.

Google Cloud Speech API is system to store the various voice in it and API is a messenger that delivers request to the provider, if the request is accepted the deliver response back.

voice commands which are translated by an android smartphone application are used. The voice commands are translated into digital texts first. The application then finds matched data by using the API. If the digital texts are found then they are going to be used as a bluetooth command to move actuators to control the doors and the windows.

I. Microcontroller Based Home Automation System Using Bluetooth, GSM, Wi-Fi and DTMF

We can control home appliances from outdoor also from indoor locations. We have used a PIR (Passive Infrared Sensor) in this system that detects an intruder. The systems also use the DTMF (Dual Tone Multi-Frequency) technology for the calling system, so the home appliances can be controlled by calling and pressing buttons of mobile devices.

Using this system, physically weak people can control home appliances from anywhere.

If one forgets to switch off the lights or other appliances while going out, it allows you to turn off the appliance with your cell phone. You can get status of your home and also can control your home power devices. This is a simple automation system which contains remote mobile host controller and several home appliances. We implement home automation using Bluetooth, GSM-SMS, GSM-DTMF, PIR (passive infrared sensor), and an internet. We set up Bluetooth then GSM-SMS then GSM-DTMF (Dual-Tone Multi-Frequency) then PIR and the last part is the internet.

The main features of this system are: Control through android mobile, Control by SMS where device is capable of recognizing the user., Through GSM modem, appliances can be controlled by DTMF tone. All devices can be controlled using phone calls., The user can control appliances.

Another feature is detecting humans or intruders by using motion detector or PIR sensor.

J. Integrated System For Face Recognition And Sound Localization for A Smart Door Phone

This system proposed a smart home door automation using both face recognition and sound localization techniques to identify foreign faces through a door phone in a more efficient and accurate way. In this system we are mainly using visitors voice to localize the proper location of the speaker.

The location information is then used to adjust the door phone camera position to frame the face in its field of view.

In order to accurately locate the facial position of the visitor, 4 microphones are positioned in a cross configuration.

For detecting face and voice, wireless interface are used to recognize the visitor and send the information to the home owner's phone. The entire control system is built using an FPGA chip. For smart door phone system they integrating 4-channel microphone sound localization, camera motor control, face detection techniques, wireless communication.

To recognize a visitor's face, the 4 channel microphones calculate Time Delay Of Arrivals (TDOA) to estimate the location of the face. The integrated system moves the camera into the corrected position and runs the face detection and recognition algorithm. The home owner is informed of the visitor's identification wirelessly.

II. CONCLUSION

This work applies the common trend of smart home by integrating smart devices with home appliance to be automated. A user friendly technology is deployed to render the entirety door automation system with its process to be controlled. Automation work is tested with fingerprint and pincode authentication. In fingerprint and pincode authentication, the cloud system helps to store the security codes and fingerprints in it. By this interface can be simplify this as a security applications. And in the pincode authentication the password can be changed by the user as desired. The Internet of Things involves an increasing number of smart interconnected devices and sensors that are often non-intrusive, transparent and invisible. IoT has been bringing new set of technological changes in our daily lives, which in turn helping us to make our life simpler and more comfortable. Though IoT has abundant benefits, there are some flaws in the IoT architecture and its implementation. So the main observation of

the paper is that IoT architecture will probably best be described by a reference model than a single architecture and that there will be many different as yet unknown applications/services that will connect to the IoT applies also to object resolution mechanisms. IoT applications rely on a communication infrastructure for exchanging information so it is important from a public policy point of view to ensure that IoT applications, which include healthcare, energy management, transportation, or any other innovative applications, will benefit from a fair access to this infrastructure.

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