

HOME SECURITY USING WIRELESS TECHNOLOGY

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Abstract— Near Field Communication(NFC) technology is one of the most secured technologies in the field of mobile application services recently. NFC is a short-range high frequency wireless communication technology that enables the exchange of data between devices. To implement system for door lock using wireless technology. In the home automation means door lock, doors of cupboard, windows lock we use this system. Also in the office doors and in a car we use this lock and open door easily without any key. We implemented an integration design of both a near field communication (NFC), PIR, ESP8266 Wi-Fi module, HC-05/06 Bluetooth module servo motor and a smartphone to achieve a door lock control system. This design consists of a built-in NFC capabilities of a Smartphone. This design also offers the Human sensing using Human Sensor Detection.

Keywords— NFC, Smartphones, Door lock; Human Sensor Detection.

I. INTRODUCTION

IoT security is the area of to make effort troubled with protecting connected devices and networks in the Internet of things (IoT).

The Internet of Things contain the increasing intensity ascendancy of objects and entities – known, in this context as things -- supplied with unique identification module and the ability to automatically transfer data over a network. Much of the increase intensity in IoT networking and communication comes from computing devices and embedded sensor systems used in industries for machine-to-machine (M2M) communication smart electrical grids, home automation, wearable technology devices and vehicle to vehicle communication.

The main problem is that because the conception of networking equipment's and other objects is relatively new, security has not always been considered in design of product. IoT products are often sold with old and harm software and embedded operating systems. Furthermore, owners often fail to update the default passwords on smart devices -- or if they do modify them, fails to select enough passwords which is sufficient for security. To increase the intensity of security, an IoT device that requires to be directly accessed over Internet, have network access is highly restricted and should be separated into its own network. The network segment should then have checked to action should be taken if there is an any problem, and identification of the potential expected traffic.

Security skilled specialist have informed about problem of the potential loss of more numbers of vulnerable equipment's are connecting to the Internet since the IoT concept was first advance in the late 1990s. In December of 2013, a scientist at Proof point, an enterprise security organization, discovered the first IoT devices infected with harmful software(botnet). According to Proof point, more than 25 percent of the botnet was made up of equipment's other than computers devices, including baby observers, smart TVs and other household appliances or devices.

PROBLEM STATEMENT

To implement system for door lock using wireless technology. In the home automation means windows lock, door lock, doors of cupboard we use this system. Also in the office doors and in a car we use this lock and open door lock easily without any key.

PURPOSE OF THE SYSTEM

“HOME SECURITY USING WIRELESS TECHNOLOGY”, its parameters and goals. This paper describes the project's target audience and its hardware, software and user interface requirements. It defines how the client, team and audience see the product and its functionality.

PROJECT OBJECTIVES

- To reduce Risk associated with Security.
- To reduce Hazard related to ZigBee protocol.
- To improve security level.
- To detect unauthorized Activities using android log application.

II. RELATED WORK

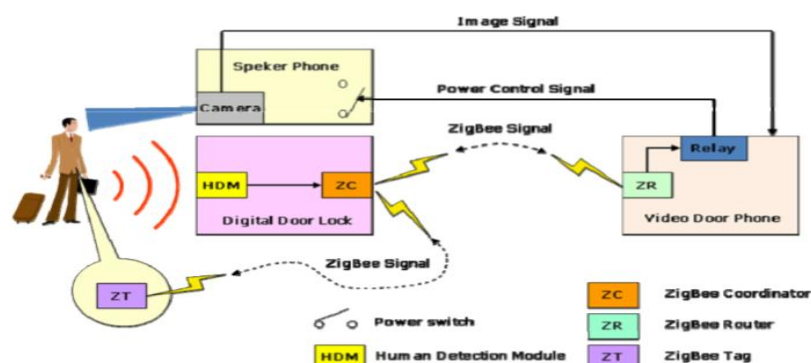


Fig. 1. System Configuration Diagram

Home network is a residential local network, and is used to connect multiple devices within the apartment or house. It may consist of a broadband modem PCs, a router, a wireless access point, other electronics and entertainment peripherals. It allows users to remotely monitor, control consumer electronics through the external network such as Internet. Until home network has greatly getting a lot of attention in both research sectors and commercial. The home network has become the network of consumer related electronics for various useful applications such as telecommunications, entertainments, remote control and automation systems and monitoring systems. Owing to the rapid growth of the Internet and personal computers, high advance telecommunication technologies, the importance of the home network has increases emphasized in the both domains.

III. PROPOSED ARCHITECTURE

Figure. 2 shows the proposed architecture of the door lock system. In that user can scan the NFC card or Tag on NFC reader. Each card or tag have its unique UID which is store in the database. This UID compared with database if the id is same then door will be open. There is a ESP8860 Wi-Fi module use for communication between server and the door lock system.

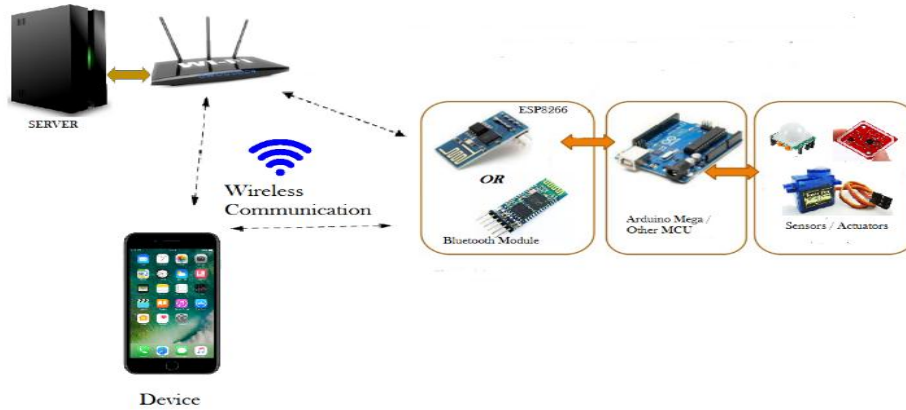


Fig. 2. Proposed Architecture

On the other hand, mobile application is there which is controlled the door lock system. Valid user login to the application and connect the door lock system via Bluetooth module (HC-05/06) and then door lock will be open or closed. Admin can add or deleted user any time. Admin have its own user name and password. Mobile application can have connected to the server via Wi-Fi to compare the user name and password.

There is a one PIR sensor is connected to the door lock system. This PIR sensor detected the human body. When PIR sensor detects the human body then door system sends the message to the mobile application.

IV. SIMULATION AND RESULTS

Development of front end is done on Android Studio 2.0 with java Language. WAMP server is used for back end of the application.

In this system Android studio is used developed the application for used the door lock system remotely. WAMP server is used for backend i.e., database. In the database there are two tables are used. One is used to stored user name and password of the admin. Another will be stored the information of user i.e., user name, password, email id and NFC UID.

Arduino IDE is used for hardware coding. In this door lock system, we used Arduino mega for connecting all the hardware devices means NFC Reader, Servo Motor, PIR sensor, Bluetooth module (HC-05/06). NFC card / Tag are used for scanning on the NFC reader. PIR sensor is detected the human body and sends the message to the android application via Bluetooth module.

Circuit Diagram

Figure. 3 shows the circuit diagram of proposed system. In that Arduino mega is used to connect all the devices. NFC module V3 used to give input via scanning cards or tags. PIR sensor also gives the input when human is detected by them

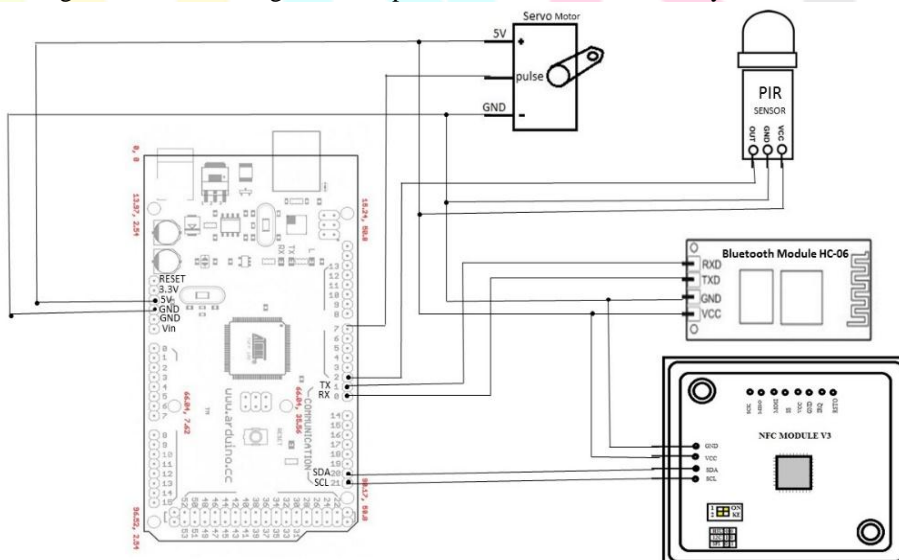


Fig. 3 Circuit Diagram

Bluetooth module HC-06 is used to communication between mobile application and door lock system. Bluetooth module sends the input of door is lock or unlock. This module also gives the output as a message to mobile application when PIR sensor detected the human. Servo motor gives the output i.e., door lock system lock or unlock.

Screenshots



Fig. 4. User Login Screen

Figure. 4 shows the User Login Screen. In that User can enter his user name and password for login into the system. This data is stored on the server. Entered data can have compared with the server data if it is matched then user can get access easily. If user wants to add his account, then sign up for the system.

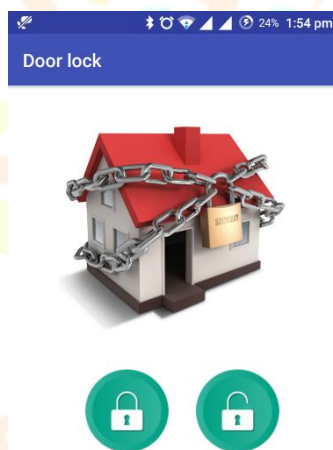


Fig.5. Lock/Unlock Screen

Figure 5 shows screen allows the user to lock or unlock the door. Using Lock button, we lock the door and unlock door lock using unlock button. This is done via Bluetooth. Bluetooth is use to communication between Door lock and Mobile Application.

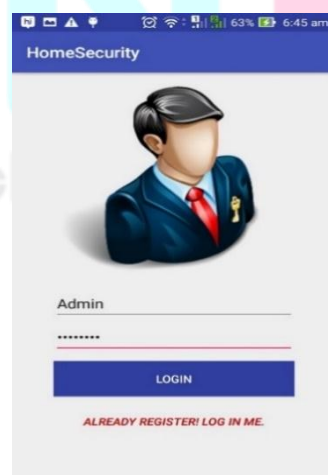


Fig. 6. Admin Login Screen

Figure. 6 shows the login for admin. There is one admin for system he can deleted or added accounts from the server. Admin can have entered his user name and password. This information is already stored on the server. Compare this information to entered user name and password if match the admin is authorized and get access to the system.

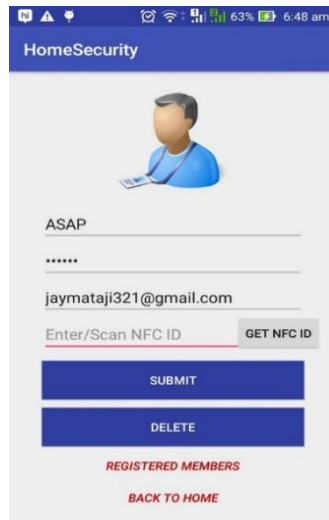


Fig. 7. User Add or Delete Screen

Figure. 7 shows the screen for user added or deleted. After Admin login to the system he can added or deleted any user from the database easily. Admin entered user's user name, password, email ID and NFC Id (if available). User name and password is mandatory for each user. After entering all information Admin submitted or deleted the account form database. Registered members button is use to shows the already registered members.

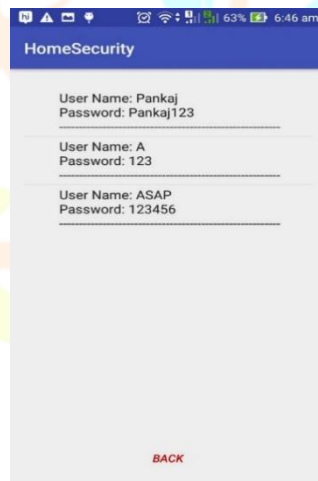


Fig. 8. Database After User Add

Figure. 8 shows the database after successfully added the user in the database. After entering all the information of user admin submit the data and user was added in the database.

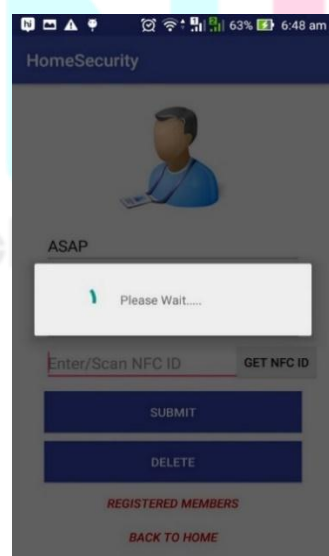


Fig. 9. User Deletion

Figure. 9 shows the screen for user deletion. Admin check the already registered members and get the user name or password of same user to delete account. Admin enter user's user name and password and delete the account from database.

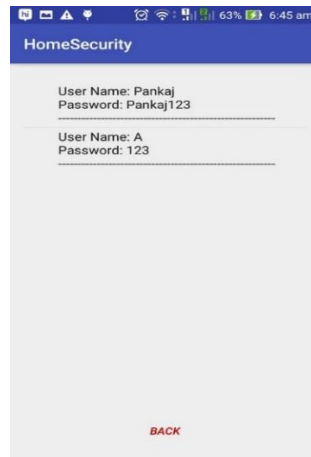


Fig. 10. Database After User Delete

Figure. 10 shows screen of Database after deleted user successfully. After getting user name and password of user admin can easily delete this account.

V. CONCLUSION AND FUTURE SCOPE

NFC technology has several advantages over other wireless technology because it provides bidirectional communication for exchanging information i.e. both devices can send and receive data simultaneously unlike Bluetooth which promotes unidirectional communication.

This system is very easily handle by user. In the home automation means door lock, windows lock, doors of cupboard we use this system. Also in the car, in office doors and windows we use this lock and open door easily without any key.

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