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SERVER ROOM ACCESS CONTROL USING SMART PHONE

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Abstract:

With the increasing use of smart phone, we developed smart door lock by using the same as We know. That security in secure room is very crucial, unlike traditional key and RFID tags we are using unique smart phone system which consist of android application, Arduino board and communication done over Bluetooth. The biggest advantage of proposed system over exiting once is that it can be easily installed with minimal requirement of infrastructure and planning.

Keywords --**UART, status register, Multibit flipflop, Delay assertion technique, Quartus II, power play analyser**

I. INTRODUCTION

The concept of door locks remained the same for the last century, while everything changes rapidly, why not use the current technologies and apply it with old ones to build something new and innovative door locks. Around thousands years ago the technology of locks and key were invented and until today with some minimal variation in security and sustainability. Locks are installed in doors stimulated mechanically but now day, wireless technologies will smart phones are very popular and everything was connected to wireless technologies (phones, television, laptops, tablets, cars and so on). Why not do the same thing with door locks? Enhancement in lock mechanism by connecting to the advance wireless technologies like Bluetooth or internet making door locks more robust and productive. Now smart phones are not only used to send and receives phone calls, send textmessages but they also are used to control various devices.

Through a mobile operating system and control a verily ofexternal devices such as TV`s,projectors, computers cars etc. The old traditional are operated by keys and RFID but it has disadvantages such as misplace or loosing keys and RFID tags someone can misused the RFID tags without owners consent our system is not limited one specific application but it can also be used for other applications like locker, cars and also home security. Smart lock system is complete advancement of standard key door lock, where all users accessing the smart door lock using smart phone secured smart door lock system can be connected to wireless technologies like Internet and Bluetooth.

II. RELATED WORK

A. Key and Lock based traditional system:

First, this is the very easiest and the now days also it is widely used system. In traditional system, users having key for opening door lock, simply user must require for opening look which traditional

mechanical lock.In big building, apartments, complexes, fraternities, offices but also owner having many keys for each and every gate or door lock, maintain access to authorized person is problem beside the costs in fabrication and duplication of keys and also security in case if lost keys. The use of smart door lock system or keyless access unit not only will solve all these problems but adds some additional advance features.

B. RFID based system :

There was lots of improvement have already done in door lock system one among them was RFID based system. In this system automatic door lock interfacing with RFID reader and user having one RFID tag, when person swipes with right tag the access control system will be granted. In the same way, when the person swipes with an unauthorized RFID card then access will be denied.

But some disadvantage there in system initially high cost restricted usage to larger businesses many of whom developed proprietary system. Although cost are falling, RFID still typically more expensive to set up and programs or user alternative system such as optical scanning just as you can forget your keys and be locked out of your home, you can also forget the RFID tag to access your RFID entry. Because of that also brings up some security issue. Unauthorized tag may be unable to read and even change data on tags without the knowledge of person who owns the object.

C. Biometric based system :

Now days it is most famous system in the world, Biometric (fingerprint door system) is secure but expensive system which is used in mostly most secure areas.

In this system, fingerprint locks operate by scanning and converting your fingerprint data into a numerical template. When someone place his/her finger on the sensor, it matches the data obtained through the finger with the saved data.

If match is found, access is granted and the door opens. But entry and delete fingerprints needs to operate multiple steps, the program is too much

trouble, convenience is not enough and there is expensive system which is not used in small businesses which is used to access multiple door.

III. PROPOSED SYSTEM:

The proposed system is smart door lock system by using Android application which is connect to Arduino board by Bluetooth connection and Arduino board connect to servo motor which is responsible for opening and closing the door lock and for managing data. We use cloud database service using this authorization of user and delete the lock user, add user, this advance feature provided to user. In this system, when user going to access the using his smart phone Firstly user must be registered and login with accurate data, then he is taking command to door lock for open and close the Bluetooth connection established between android application and Arduino board, Using Arduino board check the authorized signal and accept if it is authorized then Arduino board responsible for rotating a servo motor and door lock open and closed.

This system very cheap and flexible for access, Reply normally operates ordinary locks with keys or RFID. However, these locks have few drawbacks such as misplacing keys or forgetting passwords. Furthermore, the proposed system has wide ranges of applications and can be used for various type of locks and system, such as lockers, cars etc.

A. Architecture of system

Android Application:

The android app has two different modules i.e. user and admin. The module changes as user or admin uses the application.

User:

When user uses the application the user first need to register on application and then after that user can access the application. After that user sends the request to admin and admin gives the permission or not. Then he provides a lock key to be entered by user. After that he can access the lock

or unlock operation. User is not having access to other functions like log.

Admin:

Admin uses the application as owner of the system. Admin have the access to add new user in the system. Admin has the access to provide lock key to the user without that user cannot access the lock. Admin can also view all the access log of the system. After getting request from user he can decide to give access or not. Here admin is having highest control of the system.

Electrical Motor:

It is attached to the mechanical lock and it does work of open and close the lock by rotating from 0 degree to 90 degree.

Control Board:

The control board is a combination of small systems. It received the commands from mobile application for rotating the servo motor which further moves the lock resulting the lock and unlock operations.

Mobile Application:

The mobile application is only software that controls the whole system and provides various useful tools to the owner, such as provide key for multiple door locks and their key is in the form of five digit numbers and it also show the access events for lock operations like time and accessing the lock and Email ID of the user or creating temporary key for guests user.

Cloud Database:

Instead of using local database we are using cloud database because it is having functionality of the user or creating temporary key for guest's user.

B. System Operation:

A brief system architecture is shown in figure below,

Smart Phone to Internet:

As it is mentioned in the previous section, the Smart Phone connected with internet for accessing the database.

Because in this system, we are used cloud database, so internal connection is must, when user fill the registration data, this data is saved in cloud database using internet and for authentication purpose admin use this data.

Smart Phone to Bluetooth:

In this system, smart phone also connected to control board with Bluetooth connection. The user can now send commands to the system only using the mobile application provided.

When user send command to the control board using Bluetooth connection. Then control board start working on operation of door lock access, we are using Bluetooth connection because Bluetooth range is minimum compared to any other and minimum range provide secure distance for accessing the lock.
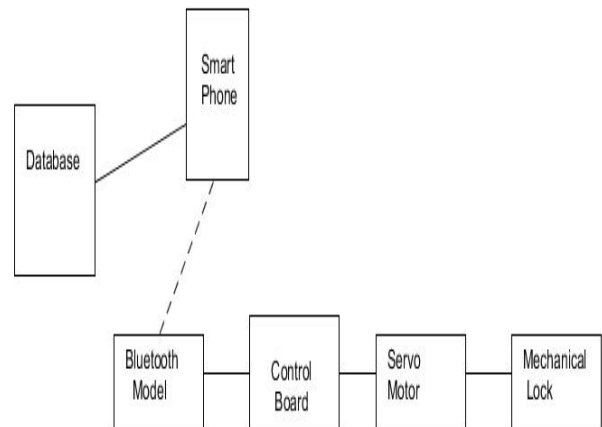

Fig. System Architecture

C. System Operation:

Servo Motor:

In our project we are use electrical motor (Servo motor) for accessing the lock.

Required Specification:
- 3 pole ferrite, all nylon gear

- Top ball bearing
- Operating Voltage: 5V~6V
- Operating Speed: 0.112sec/60degree
- Output torque: 1.6kg/cm 4.8V
- Dimension: 21.5 x 11.8 x 22.7mm
- Weight: 9g

D. Arduino Uno:

In this system we are used the Arduino Uno as a control board.

Required Specification:
- Microcontroller: ATmega328P
- Operating voltage: 5V
- Input voltage: 7V~12V
- Digital I/O pins: 14(of which 6 provide PWM output)
- Flash Memory: 32kb
- Clock speed: 16Hz

IV. CONCLUSIONS

The Smart Door Lock System will open the door leading to a wide range of innovations in the world of lock systems wherever they may be. With its ease of installation and use, minimum complexity, wide applicability options, and strong feasibility. All of the above can't be considered authentic or even possible without considerately taking into account one of the most vital aspects to the innovation security. Therefore, after examining the detailed evaluation and explanation of this phase, the project really tackles the security concerns to eliminate any worries which might cause a threat to the system's success and prosperity.

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