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Door Unlock System with IOT Security

Dr. P. S. Patil[1], Snehal K. Dattawade[2], Priyanka P. Ingavale [3], Snehal V. Killedar[4], Sagrika S. Mete[5], Swarupa R. Patil [6]

[1]*Assis.Professor, Electronics & Telecommunication Engineering, Sharad Institute of Technology College of Engineering, Yadrav, Maharashtra, India.*
[2,3,4,5] *Student Sharad Institute of Technology College of Engineering, Yadrav, Maharashtra, India.*

ABSTRACT

The system proposed is a door unlocking system containing multiple features can be used to access a certain zone. The system is implemented by using pic microcontroller with some devices finger, GSM module all the information about the authorized person.

KEYWORDS: Embedded Spy Camera, ESP32 CAM, Arduino Uno Microcontroller-ATMEGA328P, Alarm System, Web App (Blynk App).

1. Introduction

This describes the development of an IOT application based upon Digitizing a smart door lock for making it connected to the internet and able to recognize employees that work in the office. This concentrates primarily on the security aspects by listing the typical security challenges in IOT systems in general and summing these challenges up to develop a functional and secure product from scratch. A microcontroller is chosen for this project and a test environment is built to experiment and develop the security breaches. Architectural designs are chosen for the API being developed and even for the Android Application. A detailed descriptionis made of the multi-master database represented by Azure active directory and its importance to achieving the security of an essential security breach. A new technique called Eddy stone is introduced in the project to serve the transmission protocol with Bluetooth beacons. The final stage of this project is completing the development of the Android application and making sure that all the subsystems developed do communicate with each other, to deliver a functional and secure flow of the IOT system.

2. Literature Review

This paper proposed idea that in day to day life security of any object or place password based system plays a major role. This paper has considered about this and created a secure access for a door which needs a password to unlock the door. Using keypad it enters a password to the system and if entered password is correct then door is open by motor which is used to rotate the handle of the door lock. When it is entered incorrectly at the first time it will give three attempts to enter the password. Some extra features like adding new users and changing old password are configured by the keypad as usual. To display messages to the user LCD module is used. Now a day's most of the systems are automated in order to face new challenges to achieve good results. These systems have less manual operations, so the flexibility, reliabilities are high and accurate are there characteristics. Hence every field prefers automated control systems especially in the field of electronics.

3. Scope of project

Internet of things is a tremendous bias where a huge abundance of sensors and appliances would be connected to the internet and interact with the cloud. Different business applications endure, such as vehicles, homes, buildings, machines, environmental sensors and so on. IOT is growing rapidly and is estimated to comprise 18 billion connected devices by 2022 . IOT comes in a wide spectrum of different ecosystems, all with various requirements and capabilities. For example, autonomous cars inherit a highly complex system where system safety and reliability are by far the biggest factors. An IOT door security system that uses Internet of Things (IOT) technology toenhance the security of a door by allowing the door to be monitored and controlled remotely. This can be achieved through the use of sensors and other devices that are connected to the internet and can send and receive data. This allows you to monitor your door and communicate with them remotely. Other features that may be included in an IoT door security system include motion sensors, alarms, and real-time monitoring and notification. IoT Door Security with custom Android App using Firebase could be a great way to increase the security of your home or business. We also explain the drawback of traditional lock system. So, through this we got the idea of RFID way of opening the lock.it really helped to learn and study about the RFID and its tag and card reader. After that we came to discuss on the security of the lock door so we came to the proposed about the security of the doorlock system.

4. Proposed Methodology

Internet of things is a tremendous bias where a huge abundance of sensors and appliances would be connected to the internet and interact with the cloud. Different business applications endure, such as vehicles, homes, buildings, machines, environmental sensors and so on. IOT is growing rapidly and is estimated to comprise 18 billion connected devices by 2022 . IOT comes in a wide spectrum of different ecosystems, all with various requirements and capabilities. For example, autonomous cars inherit a highly complex system where system safety and reliability are by far the biggest factors. An IOT door security system that uses Internet of Things (IOT) technology toenhance the security of a door by allowing the door to be monitored and controlled remotely. This can be achieved through the use of sensors and other devices that are connected to the internet and can send and receive data. This allows you to monitor your door and communicate with them remotely. Other features that may be included in an IoT door security system include motion sensors, alarms, and real-time monitoring and notification. IoT Door Security with custom Android App using Firebase could be a great way to increase the security of your home or business. We also explain the drawback of traditional lock system. So, through this we got the idea of RFID way of opening the lock.it really helped to learn and study about the RFID and its tag and card reader. After that we came to discuss on the security of the lock door so we came to the proposed about the security of the doorlock system.
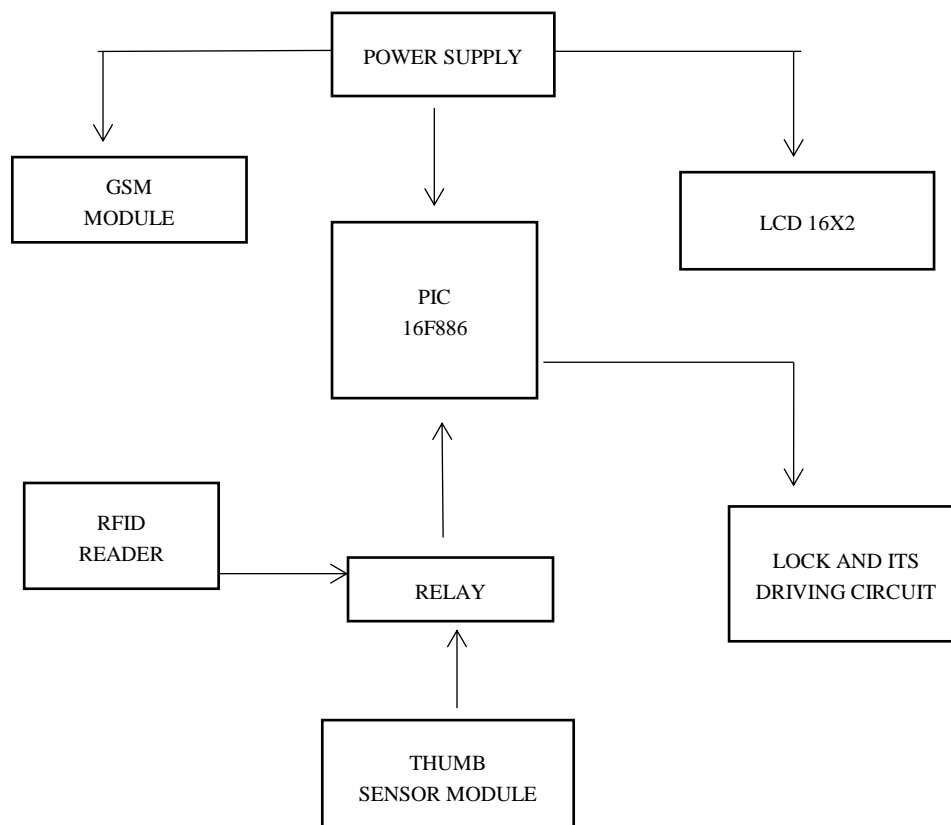

Figure 1. Block diagram for the proposed system.

5. Hardware used

1. GSM Module

2. RFID Module

3. Fingerprint Module

4. PIC Microcontroller

5. LCD Display

6. Arduino Uno

6. Advantages

1. Simple to Install

Door locks might sound complicated, but they're very intuitive and straightforward to install. All Yale's smart door locks have been designed to be DIY friendly, so you are able to fit and connect the lock yourself.

Once you know what type of lock will fit your door, then you can work out the best lock for you.

2. Provides Security

As front door security continues to be significant to the security of your home, when upgrading your lock to be a smart door lock it's important you feel just as safe and secure.

Smart door locks from Yale are all designed to provide you with a high level of security for your home. In fact, the Yale Conexis L1 Smart lock was the first smart lock to be British Kitemark Approved and has recently become the first approved IoT Kitemarked Smart Lock available on the market.

3. Assign individual passcodes

Assigning individual passcodes for family members and friends can add an extra layer of security to your front door.

With a Vivint Smart Lock, you can assign up to 30 individual access codes for kids, guests, and house staff. This means you no longer have to leave a spare key under your doormat or in the flowerpot, which can put your home security at risk.

4. Know who's coming in and out

With a smart lock, you are notified whenever someone checks in or leaves your home at any time — all through your smartphone.

This feature lets you check whether your guests have arrived, log in to see that your young children came home safely after school, and monitor when your housekeeper left the house.

5. Enhanced security

The probability of someone getting the correct four-digit PIN is 1 in 10,000. That's the same as finding a four-leaf clover. Criminals don't want to hang around your doorstep long enough to figure it out and risk being spotted by a neighbor or a surveillance system.

A passcode-protected entry is a great way to enhance your front door security, whether you're on vacation, at work, running errands, or simply when guests are using the house.

Another great benefit of smart locks is that you can set notifications to help you remember to lock the front door on your way out.

6. Smart home automation

If you're like us, you probably can't imagine daily life without your smart home devices.

With smart home automation, you can control your home's lighting through your phone, build a peaceful atmosphere with optimal system controls, and enhance the safety of your home with intelligent security — just to name a few benefits.

7. Application

- Continuous Research: It requires continuous research in every field (smart devices, fast communication channel, etc.) of healthcare to provide a fast and better facility for patients.

- Smart Devices: Need to use the smart device in the healthcare system. IoT opens the potential of current technology and leads us toward new and better medical device solutions.

- Better Care: Using IoT technology, healthcare professionals get the enormous data of the patient, analysis the data and facilitate better care to the patient.

- Medical Information Distribution: IoT technology makes a transparency of information and distributes the accurate and current information to patients. This leads the fewer accidents from miscommunication, better preventive care, and improved patient satisfaction

8. Conclusion

Fingerprint lock have gained tremendous benefits compared to conventional key door locks, combination door locks, keyless keypad lock or card reader door locks. Thus, thumbprint door locks surpass security protection, convenience, and speed. Fingerprint reader scanning is the most mature and tested type of biometric technology. Recent studies on biometrics have shown that compared to the hand method, fingerprint is more accurate and cost- effective. The duplication of biometric fingerprint technology is virtually impossible, only one in one billionth of a chance.

The major goal of this project is to develop a system that provides a robust security system to the user that the user can trust easily. This system is inexpensive and simple to set up. It is a durable and multiple mode device that can be operated by a single tap on the app. The door will close automatically

15 seconds after opening. It has many features like notification alert, multiuser function, activity monitor, only admin access, etc. It is designed keeping in mind the safety of the user.

In this work, a model of fingerprint-controlled door system that uses multi access authentication method was presented. The system architecture resent how different components exchange data through IOT.

9. ACKNOWLEDGMENT

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