



DOOR LOCKING AND UNLOCKING WITH ESP32 CAM AND BLYNK APP USING IOT

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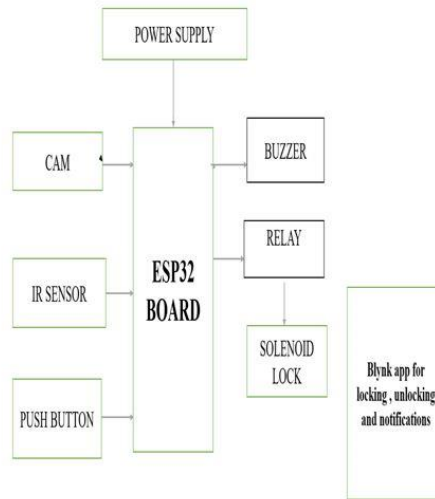
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Abstract: With the advancement of technology and the increasing use of IOT, digital door locks have become very common these days. Digital lock doesn't require any physical key but it uses RFID, fingerprint, Face ID, pin, passwords, etc. to control the door-lock. In past, we have developed many digital door locks applications using these various technologies. In this project we will build a Face reorganization system using ESP32-CAM. The AI-Thinker ESP32-CAM module is a low-cost development board with a very small size OV2640 camera and a micro-SD card slot. That it can be monitored by the mobile and can grant the permission to access the door. It also enabled with notification when someone is detected by the system and alerts to the owner.

I.INTRODUCTION

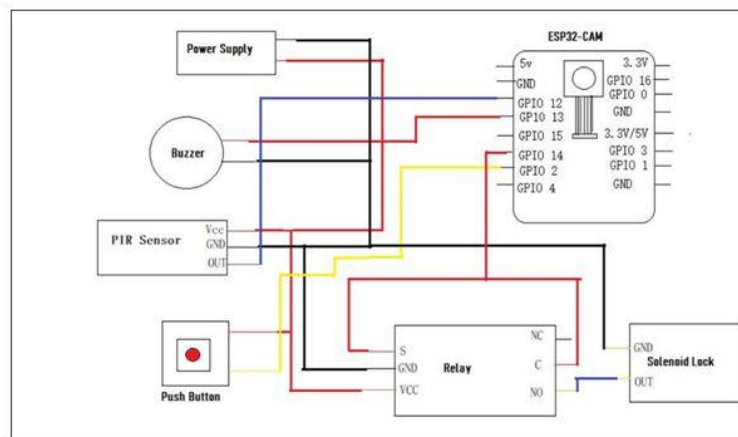
Face recognition technology is the one of the best technologies in this fast-growing world. There are many security systems but face recognition technology is best security system which cannot be hacked by anyone because everyone has different facial characteristics. A facial framework is a framework which gets the facial images and detects a characteristic of man using camera. This is an application for investigating or checking a man image in a computerized form. One of the best qualities is that only by taking the image of a face it will stores the face data. We want to provide high level security to protect home by IOT technology. IOT technology is one of most commonly used technology in the fast-growing world because it provides high security The use of IOT will give some high security level and also it helps in accessing or controlling the system remotely. So, here we are trying to provide a face detection- based door unlock system based on IOT technology. IOT has some characteristics like sensing, actuating and communication in the system. System can be automated easily. So, we can go on developing a smart home by smart security system.

II.BLOCK DIAGRAM



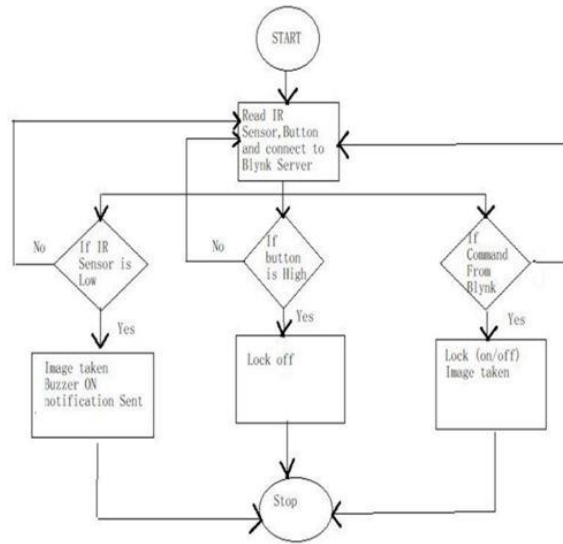
In this project we are using ESP-32 cam for taking the pictures of the people. ESP-32 has a cam with flash which takes less power. It has a chip with inbuilt Wi-Fi and Bluetooth connection with 2 high-performance, the components which we are using are power-supply, PIR sensor, relay, solenoid Lock, buzzer, push button, red and green led lights and ESP-32 cam. After supplying the power to components, ESP-32 cam will take the pictures whenever an object is detected. The object is detected by the PIR sensor and sends information to the ESP-32 cam. After taking the pictures the images are sent to the owner. The owner gets images by installing the Blynk application and login into that application. There will be a software involved to connect them both. Here, we are using c++ coding in software. This is dumped in ESP-32 cam module. The owner has the access to open or close the door remotely. The mechanism which is involved in locking or unlocking the door is relay which switches the solenoid lock to open or close the door whenever the owner gives access to it. There is also a push button which is placed inside the home so whenever a person wants to come out, by pressing the push button the door will automatically open so that the person can go outside.

III.SCHEMATIC DIAGRAM



From the above figure we can see that the power supply positive pin is connected to the buzzer(+ve) pin, PIR sensor of V_{CC} pin, relay of V_{CC} pin, push button of positive pin and ESP32 cam board of GPIO 13 pin. Power supply negative pin is connected to buzzer PIR sensor, relay and solenoid lock of ground pin, PIR sensor of out pin is connected to ESP32 board of GPIO 12 pin. Push button of negative pin is connected to ESP32 board of GPIO pin 2. Input of relay signal and output of relay output is connected to ESP32 board of GPIO pin 14. Relay of normally open is connected to input of solenoid lock. This solenoid lock is used to help in locking and unlocking the door.

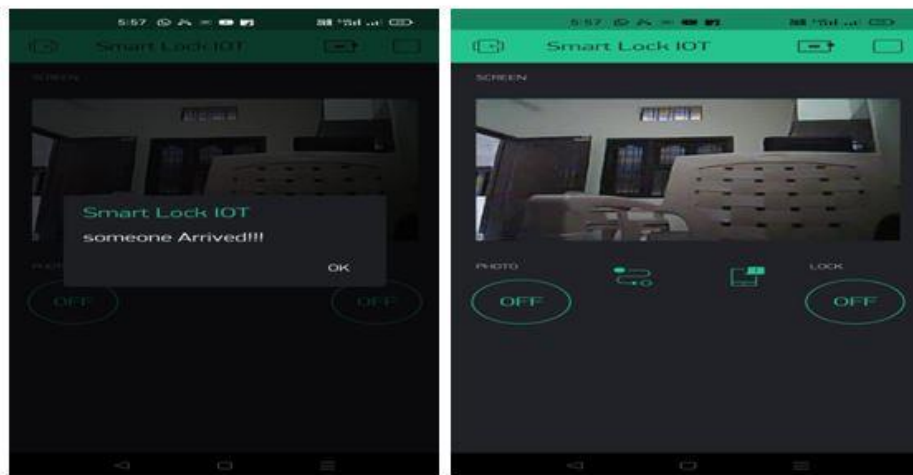
IV.FLOW CHART



From the above flow chart, we can observe that, as the process starts whenever a sensor detects a person the current which passes through become low and takes a picture of a person who is outside the door with the buzzer sound on and sends the picture to the owner through blynk application. Through blynk application we can unlock or lock the door and also there is an option to take picture by selecting that, it will take more pictures of a person. After receiving the notification through blynk application, if the command from owner is “yes”, then the door will be unlocked and if the command from the owner is “no”, then the door remains locked. If the owner commands to take one more picture of a person who is outside the door through blynk app it will take the pictures as many as possible whenever owner commands to take. This is how the owner can control locking or unlocking the door remotely through blynk application. There is also a button which is placed inside the door. The power is always high in the button so, whenever we push a button from inside the door will be opened automatically without any permission. This whole process is done whenever an object or person are detected outside the door and the process will be automatically stopped when no object or person are detected outside the door.

V. RESULTS

Here we get the output from blynk app. First, we will get the notification that someone is arrived. Next, we have to take the photo and allow the access to unlock the door, that we can see in fig.



From the figure we can see that, whenever some object or person detected it takes the image and sends a notification that some has arrived. In the app it will show two options Yes and No. By selecting option ‘yes’, door is opened with buzzer sound on and if owner selects the option ‘no’ the door remains locked. There is also an option to take picture so, whenever the picture is not clear it will more pictures of a person by selecting the option take picture.

VI. ADVANTAGES

- Low power consumption
- Cost efficient
- High security
- It reduces the human efforts.

VII. DISADVANTAGE

- Insufficient ESP32 board pins.
- It is difficult to work with this equipment when there is no power.

VIII. APPLICATIONS

- Childcare: children must be picked up to verify the identity of the individual.
- Banking with ATM: Software can quickly identify customers' faces.
- Voter Verification: Where voters need to verify their identity during the voting process, this is aimed at stopping voting in cases where voting may not proceed as expected.

IX. CONCLUSION

Whenever a person comes in front of the door the IR sensor detects and it will give information to the ESP32 microcontroller and that microcontroller process that information & updates the server, here server is nothing but blynk app. The blynk will updates and gives notification that someone is arrived. Along with we can also take picture of a person from particular scenario. The blynk will shows that who the person is arrived. Based on that instruction we give the command to open the door or not.

In the future, this system can be switched to dual verification mechanisms, such as retina scanner, fingerprint scanner, OTP, PIN code, etc. This system will first recognize the face. If a face is found in the database, will require the second verification mechanism to be any of the above one. If the person passes the verification test, only the door will open. If face is not found in the database, the image will be sent to the website. The system will provide excellent security. The face recognition mechanism can be used in combination with any other mechanism.