

# IoT Operated Door Lock using ESP32 CAM Module

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**Abstract:-** In terms of house security, the doors are playing important roll. To have the residence safe and secure, the door will be kept locked by the owner at all times. When sometimes, landlords left the house. the landlords forget to lock the door, or the landlords are not definite if they close the door or not. This paper will represent a wi-fi base smart door lock system. It also uses the ESP32 CAM module and telegram. In the working system when a person presses the doorbell the landlord receives a message on his/her mobile handset with the photo of that person. This paper also represents that if the owner wants to operate the smart lock with his/ her phone he/she is free to do so or the landlord is able to open or close the door with his/her phone after checking the photo of that person. The ESP32 CAM and internet of things (IoT) is used by this door security system to monitor and watched the status of the door, so it enhances the security of the home.

**Keywords:-** Wi-Fi lock security system, House security, ESP32 Camera, IoT based door lock.

## I. INTRODUCTION

Nowadays everyone is worried about his/her security; either it could be a security about the data of security of home. Now a days the digital lock increase very rapidly in the recent years because of technology advancement and rapidly growth of internet. The digital locks are also known as smart lock because they do not required physical key to operate. The digital lock normally uses radio frequency identification (RFID), fingerprint, face ID, passwords, pins and other method to operate. With the help of these technologies a number of digital locks can be built. We use a camera (ESP32 CAM) and IoT (internet of things) for operating a digital lock smartly and for the better security. It is very straight forward operating model. once an individual press the doorbell, the landlord receives a notification on his/her phone with a photograph of that person. The landlord also can unlock the door with the mobile device after checking the photograph.

## II. LITRATURE REVIEW

Most of the industries working in the field of internet of things (IoT) in last few years and the major goal of these industries are to make things simples, easy and smart. it needs digital connectivity with internet of things (IoT) for security reasons. The internet of things (IoT) makes the digital locks smart and also introduced the use of stepper motor. It needs digital pad to receive the input and also required a Bluetooth module to operate the devices. It is the great thing that a smart digital lock does not require a stepper motor and this application also detect the person at the door. Using this application the owner also received the photograph of the person at the door. After removing the unused component

such as stepper motor and drivers we increase the utilization of this application. After adding the new unparallel features of Wi-Fi based door lock with an access point to open or close the door. Itis unique and very user friendly.

The people are taking more interest in digital lock because of its more attractive features. There is various advantages such as easy to use, compatible etc and it provide great functionality. The digital lock also have few disadvantages which are based on that the industries working in this field and trying to improve the security models. The creation ofthe smart home is weather the parts of a home is manipulated and designed to operate wirelessly, in this paper the example of parts of a home is the door. The system should be scalable so that new devices can easily be integrated or mounted on it. It must provide auser- friendly interface on the host side, so that the devicescan be easily setup, monitored and controlled. This interface should also provide some extra services so that ifthere is any problem with the system, it can be tracked down quickly. Moreover the overall system must be fast enough to realize the true power of wireless technology. Lastly the system should be cost effective .now a days, there are lots of thefts are going on, become significant issues for all. By these of wi-fi based door lock become more simple and secure in these fields, here we can use scanner for fingerprint recognition, so that unknown cannot enter inside.

## III. METHODOLOGY

In this part covered the essential settings including the ESP32 Camera board manager installation. The system is powered by ESP 32 CAM circuit. The Circuit Diagram for IOT operated door lock using ESP32-CAM and is combined with an USB to TTL for operating the Solenoid Lock we can use TIP NPN 122 transistor. The USB to TTL boards are employed to flash the code into ESP32-CAM because ESP 32 cam does not have the self programming IC, for that we can use USB to TTL convertor.

Here Arduino IDE is employed to program ESP32-CAM. The entire code is separated into four parts. One for the main code for the camera and relay module which is used to locks or unlocks the door consistent with face recognition, and so the other three codes are for website, camera index, and camera pins. After completing the code, insert the network credentials, SSID, password. After configure the SSID and password we can open the telegram app because in the programming section we can configure the telegram bot token that have generated by the telegram app and the BOT ID. BOT ID also generated by the telegram app. After generating the BOT ID and token open the telegram app and click on the link generated by the BOT Token after that you can see your new channel ID. In the channel id we can tap on the/start button then we will get a

interface:—Welcome to the ESP32-CAM Telegram SmartLock.

- /photo: Takes a new photo;
- /unlock: Unlock the door
- /lock: Lock the door
- To get the photo please tap on /photo

When someone press the doorbell we get notification on our telegram app, and also get the photo of the person entered at the door. After getting the notification with the telegram app we can take the multiple photos by just click on /photo. We can lock and unlock the door with telegram app by click on the /lock and /unlock.

ESP 32 Cam, latest small-size camera module released by Essence. This component can easily work separately due to its tiniest design with a size of 27\*40.5mm and wide sleep current as low as 6mA. ESP32-CAM is usually broadly utilized in various internets of things (IoT) applications,

suitable smart devices for home, industrial wireless control system, wireless monitoring system, QR wireless identification, wireless positioning system signals and other internet of things (IoT) applications. The AN-USB-TTL module is a less expensive and it is used to convert TTL signal a USB interface. When connected to the PC USB port it is automatically detected module and is installed as a native COM port which is suitable with any existing serial communication interface.

The TTL Serial cables are a range of USB to serial converter cables that provide connectivity between USB and serial UART interfaces. There are various cables are available offering connectivity at 5V, 3.3V or user specified signal levels with Varsity of connector interfaces. The USB-TTL Interface is a USB module which provides 16 I/O lines that can have very high accuracy. It can be used to replace parallel port interfaces that are no longer common on computers.

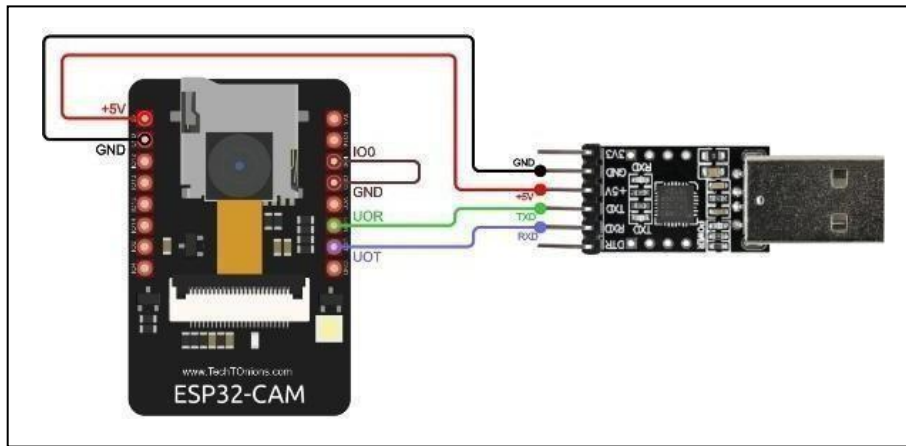


Fig. 1: Circuit Diagram of ESP32-CAM

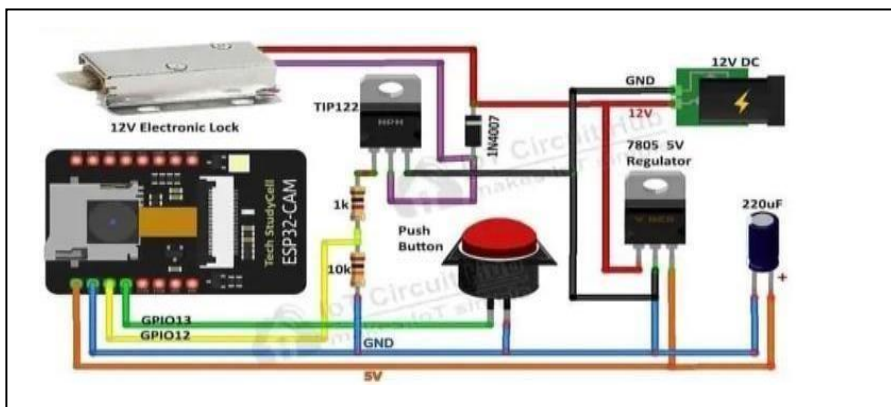


Fig 2: ESP32-CAM programming with USB to TTL convertor

#### IV. RESULT AND CONCLUSION

We successfully designed internets of things (IoT)-based door lock security system which uses the ESP32Cam to monitor the status of door and boost home security. The communication protocols are used between the smart phone and the door lock system. In this situation, due to the current COVID environment, the smart locking door system is very important and applying this internet of things (IoT)-based door lock system without using our hands is necessary and

our proposed model can be extended by integrating temperature sensors, that can be used to trigger the system to open and close the doors automatically as per the variations of the room temperature. The android applications should be able to manage more doors, windows, and basic home electronic equipment. To assure the system's completeness, a battery backup system must be considered

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