

IOT BASED DOOR ACCESS CONTROL SYSTEM USING FACE RECOGNITION

Harshada Bamnote¹, Ashirwad Rakhonde², Shweta Ghagare³, Sandhya Dharpure⁴, Kiran Kapse⁵,
Prof. Sarvesh Warjurkar⁶

¹²³⁴⁵⁶ Department of Information and Technology, Tulsiramji Gaikwad-Patil College of Engineering and Technology, Nagpur

Abstract— In this paper , the creation of a door lock system is accomplished using facial recognition in conjunction with the ESP32 cam for more accurate face detection than the present system. The ESP32, which is powered by a battery, is the system's backbone, and it controls the door's locked and unlocked systems.. This door lock system is controlled by face recognition and a smartphone., Face recognition and a smart phone are used to run this door lock system. Authorized users can use the face detection system, while unauthorised users can use the ESP32 CAM. ESP32 CAM captures the image of an unauthorised individual and sends a notification to the owner. As a result, all processing and control is completed.

Keywords— Image capturing and Notification , Safety and Security , Smart Door System

I. INTRODUCTION

, Today's homes, companies, enterprises, and banks all require a high level of protection for security reasons. Modern systems have been deployed to provide security in this location. The Face Detection System (FDRS) is a technology that recognizes body features by using mathematical factors inherent in human appearance. This technology is easy to use and secure. The Internet of Things (IoT) is a popular technology that allows you to track and control harmful devices in your house. Identifying a person to enter and exit the house is an important aspect of a home security system.

Biometrics is a type of analysis that is specific to human comprehension. Facial recognition is one of the most widely used forms of facial recognition technologies, with finger skills. one is called certification and the and the is called valid. Understanding the face mains telling structure of whose , or perhaps it is , the image of the face . Face recognition means that the system will tell you the truth and lies about the assumption given to the facial image and the detection assumption .So far , many sources have come out of non-renewable sources,

II. SOME COMMONLY USED COMPONENTS

A.ESP32 –CAM

The ESP32-CAM is a full-featured controller that has a built-in video camera and a microSD card slot. It's inexpensive, simple to use, and great for IoT devices. For compact microcontrollers, the ESP 32 series is a costly and low-power system. Dual-mode Wi-Fi and Bluetooth connection The Tensilca xtensa LX6 dual-core and single-button microprocessor in the cheaparfin ESP32 is clocked at above 1GHz. ideal for IoT devices requiring advanced camera functionality such as tracking and picture output The ESP32 camera gives you all you need to handle wonderchip compatibility and improvements with the ESP32 tool. Without the need of special technology, people can be identified and issued identification cards. You may use IoT to control your gateway and deliver notifications over the internet.



Fig. ESP32 CAM

B. BLYNK SERVER

. It can run in a local environment , a private business server , or a host on your computer . Blynk services is responsible for all communication between the phone and the device . A digital control panel that allows you to create graphic design for your work by dragging dropping widgets Blynk is a platform for the internet of things.. . You can control equipment from a distance, view sensor data, and perform a range of other functions. Blynk combines cloud platforms with applications that put people and data at the centre of business processes, and is built on the Blynk cloud. It can be installed locally, on a private enterprise server, or on your PC as a host. Blynk provides service. An optical sensor is a transitory device that converts a spectrum's visible "light energy" or infrared component into an electrical signal. Because they convert photons into electrons, optical sensors are commonly referred to as "photosensors." A photovoltaic is a device that, in some manner, replaces electrical equipment, such as a photo register or a photo conductor. The next device is now isolated.

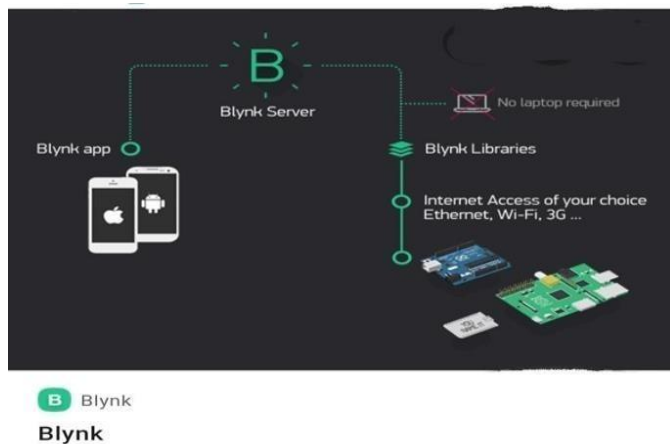


Fig. . Blynk Server

C. ARDUINO UNO

.Smaller devices are more powerful , simpler , cheaper able to do more work , and more expensive with the ability to perform smaller task compare to there predecessors , which take up more space . Microcontroller have been introduced into the electronics industry with the goal of simplifying operations with remote connectivity and automation in every way . . In an integrated system, microcontrollers are utilised to keep devices working according to their demands and requirements. A USB cable, 14 digital I/O numbers, 6 analogue pins, and an Atmega 328 microcontroller are all included in the electronics. . It also has Tx and Rx pins for serial connection. There are many various types of Arduino display models on the market, including the Arduino ONE and IOT. Using the Arduino ONE interchangeably is the ideal method to use them.



fig. Arduino UNO

D. Electronic door lock 12v :

Electrical keys that run on 12 volts Customers can open and close remote screws without using a key with automatic locks. The program's login keys can also be screwed and unlocked under certain conditions without the need for human participation. IoT sensors are used in user locks to employ wireless inbound devices that allow users to access the port using their smartphone or other connected devices via the internet. Without a key, a smart lock allows users to open doors and distribute virtual keys to guests from anywhere. To activate or remove power from the key, electrical locks use magnets, monsters, or motors. Essential functions, such as variables, can be performed independently. You can, for example, remove a network access point from a home or do difficult tasks like managing device user access. By creating or removing power, power locks drive the keys with a magnet, electric motor, or machine. Using keys is as simple as using a switch..

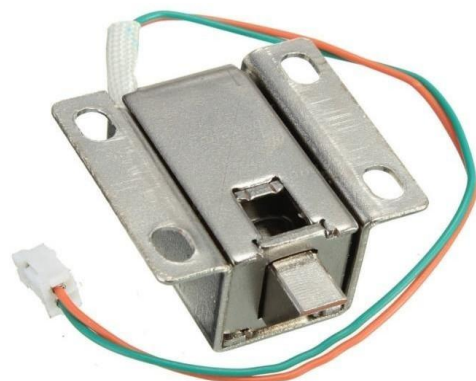


Fig. Electronic Door Lock 12V

III. LITERATURE REVIEW:

A . "Motion Sensing and Image Capturing Based Smart System on Android Platform"

Smart locks were previously utilized to improve the security aspects of the home. Because security is provided by the door itself, the proposed approach can eliminate the concept of a door lock mechanism. When someone walks in front of the door, a motion is triggered, the image is captured, and the owner is notified. In this system, a mobile phone is linked to the door, and the owner is notified whenever someone comes to his house. By glancing at the photographs, the owner of the house can send an open door signal to only trustworthy visitors. During the implementation of this project, a smart phone was used. If the owner is busy and someone knocks on the door, the owner receives a notification but is unable to respond, an issue arises.

B . "Design And Implementation of Automated Door Accessing System with Face Recognition".

Biometrics is a type of analysis that is specific to human comprehension. Facial recognition is one of the most widely used forms of facial recognition technologies, with finger skills. one is called certification and the and the is called valid. Understanding the face mains telling structure of whose , or perhaps it is , the image of the face . Face recognition means that the system will tell you the truth and lies about the assumption given to the facial image and the detection assumption .So far , many sources have come out of non-renewable sources,

During the implementation of this project, a smart phone was used. If the owner is busy and someone knocks on the door, the owner receives a notification but is unable to respond, an issue arises.

C . "Development of Intelligent Door Locking System on Face Recognition Technology".

This paper describes a low-cost smart door locking system that uses facial recognition technology to make decisions. The system is controlled by an Arduino UNO and an Android-based smartphone. It can handle all aspects of facial recognition on its own, including face detection, feature extraction, and face recognition using open CV libraries. The system isn't a fully automated security system. It does, however, provide a more comfortable means of accessing the facilities. The user does not need to do anything because the camera searches for the registered faces in real time.. is project is It is more expensive since it employs additional door locking and unlocking techniques. It makes use of a facial

recognition system. It also uses an electromechanical locker system. However, if a facial recognition system is in place, there is no need for a keyword system.

IV. EXISTING SYSTEM

Biometric door lock system-

. If you use a typical key-based system, you'll either have to travel to a key-cutting shop and receive actual keys for the authorized persons, or you'll have to hide your key outside where anyone may find it. If there is electronic lock code cracking, some of it is done by those who are the most knowledgeable. If your password is critical, it is recommended that you choose a random password to increase your security because it is easier to guess the number at important dates. If you don't know what the benefits and drawbacks of getting a biometric entry door lock are, fingerprint scan door locks require electricity to operate, and a power outage might render them completely worthless. The Internet of Things (IoT) has ushered in significant progress in the realm of home automation. Many items can be operated using a passive approach that detects the individual's infrared signal and is quite inexpensive. Ultrasound and radio waves are used to analyse the environment and return a signal for door access and conflict resolution. .

Other automatic smart door systems exist, however they are only focused on signal creation and processing. Some smart doors have their own remote control that may be used to operate them. This strategy, however, has a number of flaws. The entire system becomes inaccessible if the remote is lost or damaged.

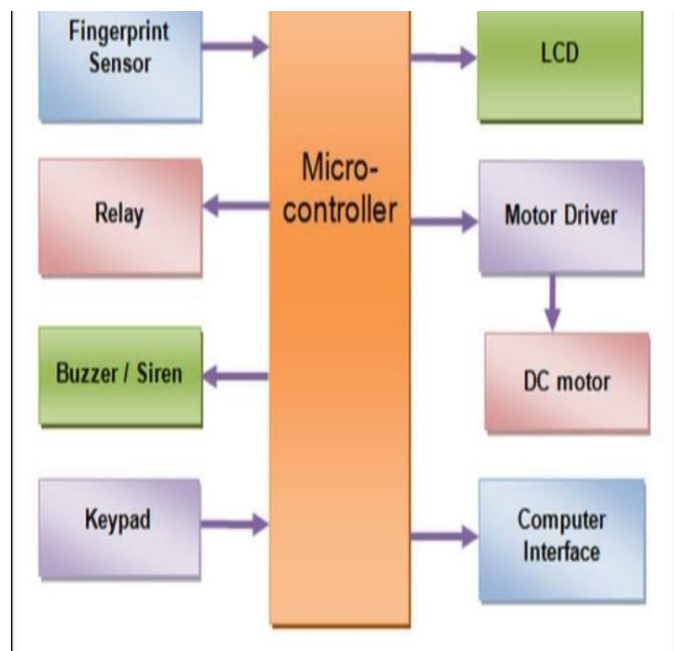


Fig. biometric door lock system

V. PROPOSED SYSTEM

IOT based Door Access Control Using Face Recognition System-

We're working on an IoT solution that will allow us to operate doors using facial recognition. Let's take a look at how it works: Using a face-to-face system, manage IoT capabilities. We're working on a technology called IoT function that allows you to control the gateway from the exit screen. Let's take a look at how it works: We're working on an IoT-based portal entry system named "IoT-based gateway system employing face recognition." The smart door system needs to be redesigned for some test questions.

distinct applications in smartgate systems.. We sell computer hardware that includes complex compilation systems, as well as systems that incorporate hardware, computer control, and computer hardware. These images, unlike backpackers, include a photo booth to separate persons. People break into homes and attempt to look after their occupants.

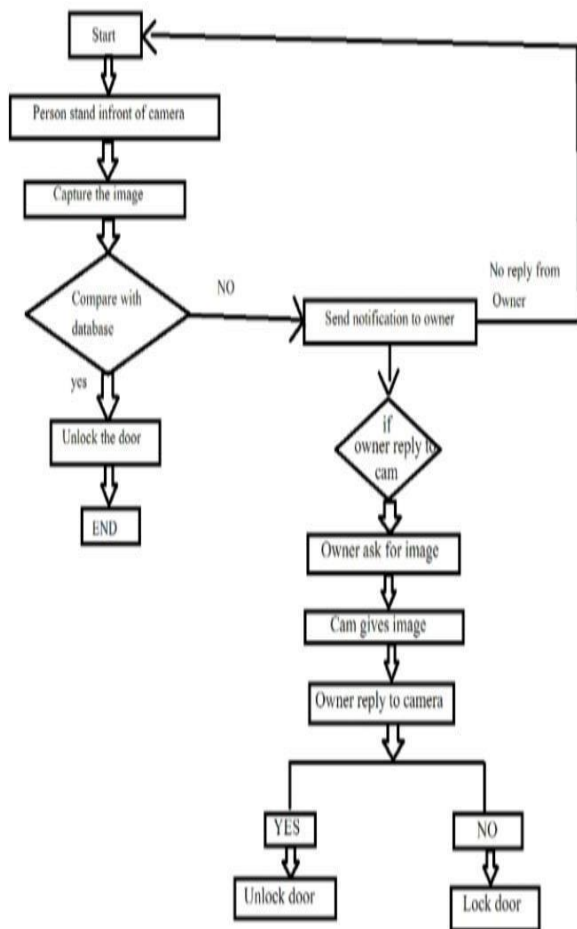


fig: Working flow of digital door lock system using Face detection and Smartphone

. For some test problems, the smart door system needs to be changed. It provides a methodology for making complex building connections that includes the deployment of equipment, software, and tablets. Unlike runners, this frame contains a shot to determine who is attempting to enter the sand while being considerate to the owner. Images are saved in the cloud and can be accessed at any time.. The information you'll need later is saved in the cloud this way. This system has the advantage of an easy-to-use ESP32 battery with doors and knobs. Due to communication challenges, these services need the creation of

Relevant data is kept in the cloud in this manner for future study. .. The main goal is to make a map of all the doors. and put the phone away When you make a call between phones, the panel sends you an SMS. This is an IoT-based gateway control system for any operation that uses a facial recognition system if a visitor finds the host and its surroundings.

VI. Conclusion

This demonstrates that it is both dependable and enjoyable. It is only accessible from a distant point. Locker rooms, bank keys, auto doors, bank vaults, and home offices are all easy to use. It's a global perspective on what's dedicated to the Internet. We have successfully created a strong face-to-face export system that may be used as a low-cost project to replace fingerprint / facial recognition systems.

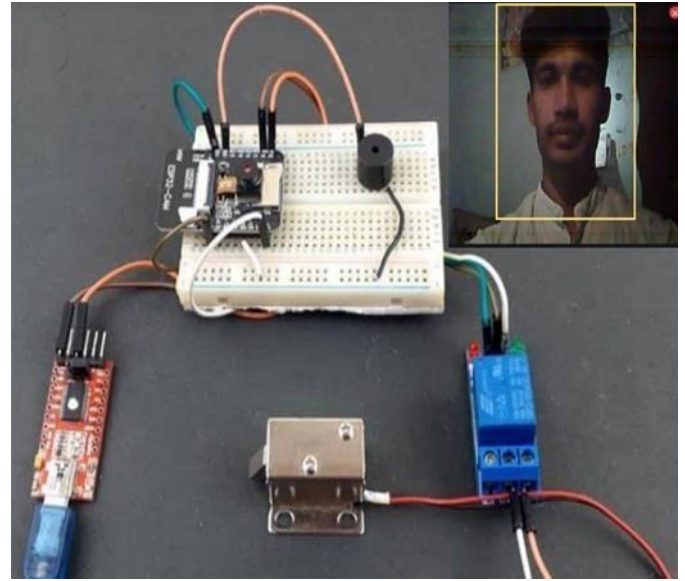
VII. Result

Face and face design can be employed with this door lock system. The facial detection system allows authorized users to log in. Those who do not have access to it can use ESP32CAM to log in. The ESP32 CAM records the image of an authorized people and sends a notification to the owner. All of the data created is saved in the cloud. As a result, all control is in the cloud... Utilizes a digital camera.

.fig. working of digital door lock system using face recognition.

VIII. Future Scope:

In the future, the detection system will only accept social media photographs with file protection. Flexibility to work with the camera in a variety of ways and to feel at ease with it. We are not attempting to demonstrate student attendance at this time. We also figure out who can do it if it doesn't work out. In some lighting circumstances, the present output system works effectively, but not in others .A different method for face control is recommended: environmental detection devices. Cut off the road. Improve the accuracy and satisfaction of test results.



IX. REFERENCES

1. "Real-Time Monitoring Security system integrated with Raspberry pi and e-mail communication link " 2019 author Jayendra kumar , Saurabh Kumar, Anupma Kumar.
2. Mrutyunjay Sahani, Chiranjiv nanda, Abhijit Kumar and Biswajeet Pattnaik, "Web Based Online embedded door Access control and home security system based on face Recognition" 2015 International conference on Circuit, Power and Computing Technologies.
3. "IOT based facial recognition door access control home security system using raspberry pi" 2020 International Journal of power, Syafeeza Ahmad Radzi, M.K Mofid Fitri Atif.
4. "Face Recognition System using IOT" 2017 International Journal of Advanced research in computer Engineering and Technology, Sandesh Ku
5. "Home security system with face Recognition based on convolutional Neural network" 2020 International Journal of Advanced computer science and application, Nourman irjanto, Nico surantha.
6. "Design and Implementation of Automated door accessing system with face Recognition" 2013 International Journal of science and modern Engineering, L.Yugashini, S. vidhyasari.
7. "Face Detection in color Image" 2015 IEEE transaction on pattern analysis and machine intelligent, Rein-lien Hsu, Mohamed Abdel.
8. "A Practical Digital Door Lock Smart Home" 2018 Yuan Chih yu.
9. "Motion Activated Security camera using Raspberry pi" 2017 IEEE, Author K.N.K Kumar and Nataraj and t. p. Jacob.
10. "Prototype Design of Smart Home System Using internet of hings", 2017 IEEE Author T.S. Gunawan , I. rahmithul ,H. Yaldi , M. Kartiwi and N. ismail. Decheng Peng and chen Peng.
11. "A design and implement for simple smart home system for consumers" 2016 28th Chinese Control and Decision Conference (CCDC).