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ijircce@gmail.com

www.ijircce.com

# Facial Recognition Based Safety Locker System

Gokul Vignesha A T<sup>1</sup>, Gokul R<sup>2</sup>, Ilavenil P<sup>3</sup>, Naveen M<sup>4</sup>, Dr. B. Anni Princy<sup>5</sup>

UG Student, Dept. of I.T., Panimalar Engineering College., Chennai, Tamilnadu, India<sup>1,2,3,4</sup>

Assistant Professor, Dept. of I.T., Panimalar Engineering College., Chennai, Tamilnadu, India<sup>5</sup>

**ABSTRACT:** A day to day home security level grown up to provide security to our house IOT based face recognition can be implemented. It's a method that identifies the visitor. If the face recognizes visitor, it will greet them by name and the door will be unlocked and opened. If they are not identified door will not be unlocked. The system will perform detection and recognition rapidly in real time when face in front of camera. This project basically utilizes the camera, and then internet connection to create a door unlocks itself by facial recognition. If the user at the door is recognized, door will be unlocked! This project is mainly for future features: safety, monitoring, security and control to home automation. Firstly the system needs a face authentication for the visitor to be able to enter the home (lock/unlocked). When an unauthenticated tries to log into system, this face will be capture the image of visitor

**KEYWORDS:** Deep Learning; Facial Recognition; Internet of things; Raspberry Pi; Face Detection;

## I. INTRODUCTION

Deep Learning is a piece of AI, is utilized to take in a chain of command of highlights from input information. These days, specialists have seriously examined Deep Learning calculations for taking care of testing issues in numerous regions, for example, picture grouping, discourse acknowledgment, signal preparing, and natural language processing.

Deep Learning calculations have been widely concentrated as of late. As a result, there are many related methodologies. As a rule, these calculations can be gathered into two classifications dependent on their structures:

1. Restricted Boltzmann machines (RBMs).
2. Convolutional neural networks (CNNs).

Face detection is a PC innovation being utilized in an assortment of utilizations that recognizes human countenances in computerized pictures. Face discovery likewise alludes to the mental procedure by which people find and take care of appearances in a visual scene. Face location can be viewed as a particular instance of item class recognition. In object-class discovery, the undertaking is to discover the areas and sizes of all articles in a picture that have a place with a given class. Models incorporate upper middles, people on foot, and vehicles. Face-location calculations center around the identification of frontal human appearances. It closely resembles picture recognition in which the picture of an individual is coordinated a tiny bit at a time. Picture matches with the image stored in the database. Any facial component changes in the database will ruin the organizing method. A dependable face-identification approach dependent on the hereditary calculation and the eigen-face strategy:

Initially, the conceivable natural eye districts are distinguished by testing all the valley locales in the dark level picture. At that point, the hereditary calculation is utilized to produce all the conceivable face districts which incorporate the eyebrows, the iris, the nostril and the mouth corners. Every conceivable face applicant is standardized to lessen both the lighting impact, which is brought about by lopsided brightening, and the shirring impact, which is because of head development. The wellness estimation of every competitor is estimated dependent on its projection on the eigen-faces. After various cycles, all the face competitors with high wellness esteem are chosen for additional confirmation. At this stage, the face evenness is estimated, and the presence of the distinctive facial highlights is checked for each face up-and-comer.

OpenCV (Open Source Computer Vision Library) is a library of programming limits chiefly focused on constant PC vision. Initially created by Intel, it was later bolstered by Willow Garage then Itseez (which was later obtained by Intel). The library is cross-stage and free for use under the open-source BSD permit.

Facial recognition is one of the most energizing uses of profound learning. The ascent in the appropriation of Facial recognition frameworks has been amazing as of late; be that as it may, it went under a ton of examination of late. There are different AI devotees who feel that the utilization of any sort of Facial recognition framework ought to be appropriately controlled so as to forestall terrible exercises. The dangers like information spillage, security infringement and so on, beginning from reckless utilization of Facial recognition frameworks are truly genuine, and henceforth legitimate measures

ought to be taken to maintain a strategic distance from them, yet significantly after all the ongoing analysis, you need to concede that it is as yet a truly valuable application which can be generally used to improve individuals' lives.

FaceNet gives one of a kind design to performing errands like face acknowledgment, confirmation and bunching. It utilizes profound convolutional organizes alongside triplet misfortune to accomplish best in class exactness. FaceNet gives a brought together implanting to confront acknowledgment, check and grouping undertakings. It maps each face picture into a euclidean space with the end goal that the separations in that space relate to confront comparability, for example a picture of individual A will be put nearer to the various pictures of individual A when contrasted with pictures of some other individual present in the dataset.

## II. RELATED WORK

Sowmiya et al Created to associate any entryway with web. In this framework client likewise actualized PIR sensor and camera. PIR sensor utilized for identifying individual and camera utilized for catching the video of the individual who comes at the entryway. The video was sent through 3g dongle to approved individual. They had additionally talked about certain focal points of this framework. They had finished up utilization of this framework in banks, emergency clinics and so forth. Be that as it may, their proposed model didn't give the office of sending messages to the approved individuals.

Lately, the procedures J. Kartik et al . Have proposed two frameworks are proposed, one depends on GSM innovation and different uses a web camera to identify the gatecrasher. The main security framework utilizes a web camera, introduced in house premises, which is worked by programming introduced on the PC and it utilizes the Internet for correspondence. The camera distinguishes development of any interloper before the camera estimations or camera go. The item bestows to the arranged customer through Internet organize and meanwhile, it gives a sound caution. The second security framework is SMS based and uses GSM advancement to send the SMS to the proprietor. dependent on the organic properties of people having the much huge in the recognizable proof of people where different methods like passcodes, OTP age and different kinds of security modes having the potential outcomes of getting taken, abused and fashioned and so forth. Consequently the organic properties like distinguishing proof of face fingerprints, Palm, ear, Iris, retina and mark can be utilized which are not effortlessly gotten to by anybody. The significant motivation behind face acknowledgment is to check and distinguish. Face acknowledgment applications are assuming huge job in the accompanying fields like security examination, Camera reconnaissance process, General character check, criminal case examination, database the board frameworks, application dependent on shrewd card and different sorts of attractive cards.

Likewise, the basic procedures have additionally been adjusted and utilized in important applications like sex characterization, motion acknowledgment, facial acknowledgment and following. The motion acknowledgment can be utilized in the field of medication for checking emergency unit. The facial acknowledgment can be executed for following vehicle driver face where face acknowledgment can likewise be mixture with different biometrics like discourse, unique finger impression and step acknowledgment. It is like article acknowledgment. Human countenances are for the most part seeming, by all accounts, to be comparable and contrasts between them are insignificant. Despite the fact that face is definitely not a novel, there are a few calculates that show up of the face. It very well may be delegated follows; Intrinsic elements and extraneous components. Natural speaks to the target of a face. It is separated into relational and intrapersonal.

The programmable electronic code lock gadget is customized so that it will work just with the right passage of predefined digits. It is additionally called a coordinated combinational sort lock. A cellphone controlled secret phrase ensured entryway lock framework is as appeared in which was proposed to open the entryway with the assistance of phone gadgets by entering a particular code. The client can make a call to a system's number. This call is answerable for opening or shutting of the section with the utilization of the right secret word.

The palmtop acknowledgment is the following stage for unique mark acknowledgment. It works on the picture of the palmtop. Right off the bat framework takes a picture of the palmtop, then it takes a shot at that picture by parceling it and the procedure is required. Toward the end, confirm the opportune individual.



### III. PROPOSED ALGORITHM

Continuous human recognizable proof frameworks are significant for security, observation and biometric applications. Normally it is attractive to identify, follow and perceive people in open zones, for example, air terminals, malls, in territories with confined access, for example, private workplaces, houses and so on. Human recognizable proof can be performed by investigating its biometric data, for example, fingerprints, face, iris, palm prints, palm veins, and so on. In any case, for quick and advantageous individual acknowledgment, still the most reasonable biometric boundary is facial data.

The Proposed system was fabricated utilizing a superior processor. As and when a human is distinguished, the Pi camera catches the picture of the individual. Face acknowledgment calculation is run on the caught picture utilizing Open CV in the Raspberry Pi based on the pictures spared in the framework. In the event that the face is remembered it suggests that an approved individual is going after for the entryway get to and subsequently, the entryway lock is opened. On the off chance that the face isn't perceived, at that point, the remote client will get the picture of the individual by means of mail. At that point, the client can have the option to see the mail for the picture of the individual attempting to get to the entryway.

### IV. PSEUDO CODE

- Step 1. User gives connections and gives power supply to the connected system.
- Step 2. After giving the connections, user opens the VNC Viewer in laptop.
- Step 3. User has to enter the IP address of the Raspberry pi to see the screen and operate it virtually.
- Step 4. The Laptop and the Raspberry have to be connected to the same network.
- Step 5. The user then opens the opens the python file in Raspberry pi and execute it in command prompt by using following command.  
**LD\_PRELOAD=/usr/lib/arm-linux - gnuabihi/libatomic.so.1 python demo.py**
- Step 6. After executing the python file the video will be on.
- Step 7. When user faces the camera, the code will perform face detection and face recognition by comparing the person facing the camera with the databases images.
- Step 8. If both the faces are matched, the door will be open.
- Step 9. Otherwise, the captured image of the person will be sent to the owner's mail.

### V.RESULTS

#### 1.Outlook:

Outlook

#### Description:

The above figure(5.1) represents outlook of the project. Here, user connects Raspberry pi to servomotor and the Laptop.

#### 2. Connecting to Raspberry PI:

Connecting to Raspberry pi

#### Description:

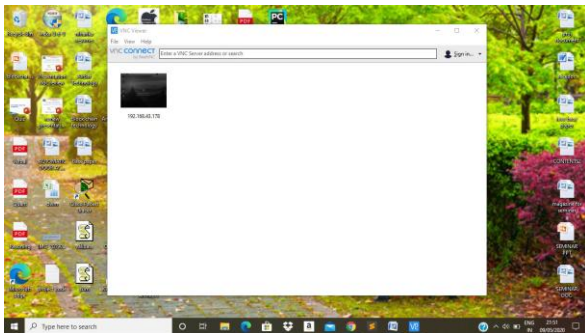
VNC(virtual network computing) Viewer is a type of remote-control software that makes it possible to control another computer over a network connection. Here we have used this to connect to raspberry pi and operate the code.

#### 3. Receiving mail for Unknown person:

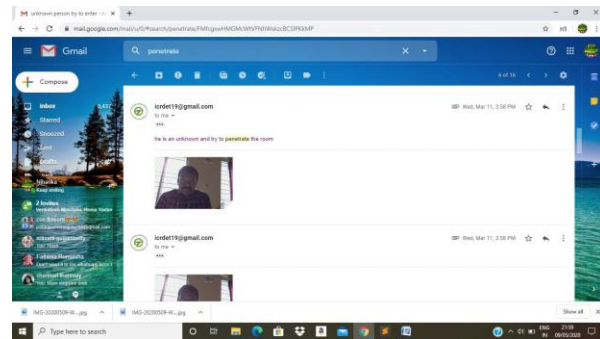
Receiving mail for unknown person. figure(5.2)

#### Description:

The door will be open for known person. If unknown person tries to enter, it will send the image of the unknown person to mail.



Fig(5.1) Connecting Raspberry pi



Fig(5.2) Receiving mail for unknown

## V. CONCLUSION AND FUTURE WORK

In this venture, we are helping clients for the development of the entryway security of delicate areas by utilizing. Face identification and acknowledgment utilizing CNN Facenet. In the event that a face is remembered, it is known, and else it is obscure. The entryway will open consequently for the known individual by coordinating with the realized database picture. Then again, for the obscure individual, the picture will be sent through Google Cloud Messaging to the proprietor's mail. Albeit many preparing pictures are utilized, computational productivity can't be diminished altogether. This framework can distinguish and perceive a picture fastly. Subsequently, this framework can be utilized in programmed confirmation of individuals to improve entryway security for obscure people. This improvement plot is modest, quick, and exceptionally solid and Raspberry pi takes less force.

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