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AUTOMATED DOOR SYSTEM USING FACE RECOGNITION BY MACHINE LEARNING

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Abstract - This project proposes a survey on face recognition using by using python programming and from Open CV library Haar cascade method. Machine learning has been shown that is one of the most successful tool to build high performance face detection systems. The face is one of the easiest way to distinguish the individual identity of each other. The process of face detection mainly involves two important process detection and recognition. Hence it stands as the most secured way for locking systems in many fields. We designed an automated locking system by implementation this feature to 12 v solenoid electronic lock. This proposed is more effective, reliable, and this system consumes very less data and power compared to the other existing systems.

Key Words: Open CV, Database, Recognition, Detection,. 12 v solenoid electronic lock.

I. INTRODUCTION

Facial recognition is a way of recognizing a human face through technology. A facial recognition system uses biometrics to map facial features from a photograph or video. It compares the information with a database of known faces to find a match. While initially a form of computer application, it has seen wider uses in recent times on mobile platforms and in other forms of technology, such as robotics. It is typically used as access control in security systems and can be compared to other biometrics such as fingerprint or eye iris recognition systems.

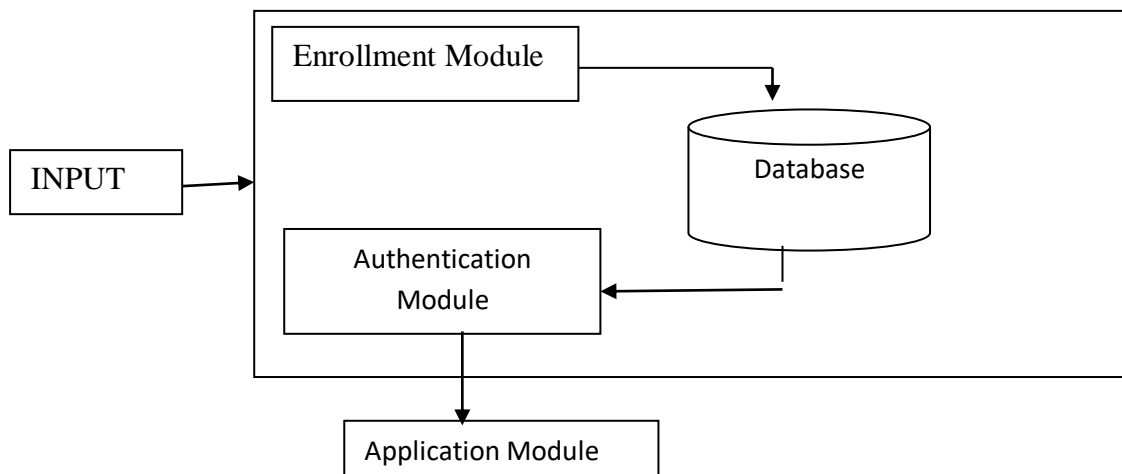
Face detection is more challenging because of some unstable characteristics, for

example, glasses and beard will impact the detecting effectiveness. Moreover, different kinds and angles of lighting will make detecting face generate uneven brightness on the face, which will have an influence on the detection process.

The major drawbacks in a common door lock is that anyone can open a conventional door lock by duplicating or stealing the key and its simply impossible if we want our friends and family to enter our house, without being actually present over there. Thus why not just eliminate these problems. So, to simply convert this normal door lock into a smart lock, which can open the door whenever we turn up in front of the gate or when we want it to open up for someone else without being physically present, we need to modify the door.

II. SYSTEM ARCHITECTURE

The Architecture of the proposed system is the design diagram which depicts the scope of the project with the whole system design. In architecture diagram, it highlights the modules with its various functions as a process. It aims to convey the internal design of the proposed system the following.



Input Unit

In input unit, the Facial images for Face Recognition and Video frames for person detection are captured from camera input devices respectively.

Processing unit

The data which is collected from Input unit that is captured Image and Video frames input is fed into the processing unit in which the processing or calculations are performed on the proposed person detection and door lock system module, Here the processing unit is nothing but a Raspberry Pi board, along with code scripts of the implemented modules.

Enrollments Module

In this enrolment module, the data which collected from input camera means person face image is stored in the database. Before storing the image it will use feature extraction means it is converted in Haar Feature-based Cascade Classifiers.

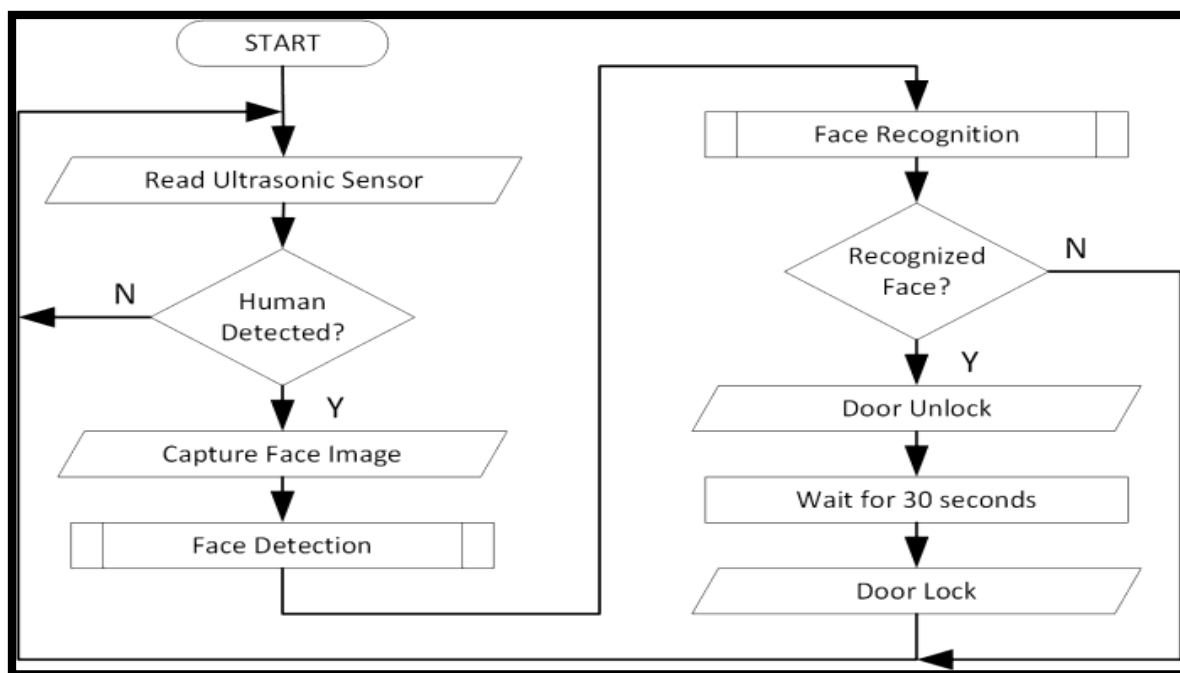
Authentication Module

In this module, we recognize and detect the input images. This module is connected to the outer side of the door, where the captured image converted into Haar Feature based Cascade Classifiers. And matching this feature extraction image with the database.

Application Module

The Application specific unit which consists of Door lock circuitry, it is associated with Door lock system module of authentication module and it starts functioning according to results of the module to perform door lock open/close operation based on Face Recognition.

Testing procedure: Install Open CV and Python 1. Write the code for detecting and recognition of image through the camera. 2. Then start the training code, and the camera will open up, Accuracy depends on the number of data sets as well as the quality and lighting conditions. 3. Take pictures of the person for face recognition after running create database by script. It automatically creates Train folder in Database folder containing the face to be recognized. You can change the name from Train to the person's name. The result in the creation of the real-time database is recorded. The real-time database is created by using python. While executing it 100 images of each subject. Likewise, databases should be created a dictionary and it creates each image size of variable pixels of height and width. While creating the database, the face images must have different expressions, which is why a 0.38-second delay is given in the code for creating the dataset. In this example, we take about 45 pictures/images and extract the face, convert it into greyscale and save it to the database folder with its name. 4. After program execution, the database is created and then run face recognition program. And the database is accessed by the program and it will match the live stream video image with it.



III. EXPERIMENTAL RESULTS AND DISCUSSION

The experimental results shown below defines two different cases like if it is an authenticated person then the magnetic door will be opened automatically and in the case of unauthenticated person the magnetic door will remain closed and with the help of the GSM an SMS will be delivered to the user. The captured image is compared with the image in the database, by extracting the eigen face and eigen values. With these features the image is decided to be an authenticated one.

IV. FUTURE WORK

- If a blacklisted person tries to open the door, the system will send a message to the admin using GSM module regarding the same.
- A real time speaking assistant can be deployed to make the system more user friendly and efficient.
- Database can be linked to cloud in case of power failures and data loss.
- Highly secure protocols such as TLS can be deployed to ensure there is no security breach.

V. RECOMMENDATION

- We proposed the system where the student can show their RFID tag which initiates the

- camera and a face is captured and recognized so that attendance is marked.
- We can use in central libraries

VI. CONCLUSION

In this proposed system door access system by using face recognition and along with the e-Mail alert system has been presented. This system has been used with home door lock access control based on face recognition method by verifying enrolled facial images. Concern persons will be informed successfully about the person detection via e-mail alert generations along with details attached. Face recognition is one of the several techniques for recognizing people. The Haar Cascades algorithm is one of those algorithms. As we show Haar Cascades has very good performance and is very accurate

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