Smart and Secured Home Automation System

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Abstract
The Era of time that we people live in safety and security of our homes in the society is questionable with number of crimes increasing in thefts and lack of good security to homes. The proposed system has a great feature of face recognition for security Controlling of home appliances. LPG leakage is detected through the sensor, since these devices and sensors are connected to common infrastructure, they form the internet of things. The project aims at providing remote access and control or not that effective in terms of being 'smart', this project includes concepts of few machine learning algorithms along with computer vision to shape and combine together a "smart learning automated system" that can detect both Gas leakage and Fire detection.

I. INTRODUCTION

In the present scenario, Security is required since crimes are escalating dramatically. Another way to think about security is as a precondition for one to grow and advance without restraint and with the assurance that no harm will come to them. For this reason, we are introducing any automatic door lock security system. With the growth of its content, cameras are employed more and more in a variety of applications. One of these is a camera-based automatic door lock security system. The Internet of Things (IoT) is the network of individually identifiable objects that are integrated into the current Internet infrastructure.

1.1.1 Fractional process

The proposed system consists of Interfacing of camera to capture live face images. Create a database of authorized person if they exist. Capturing current image, save it and compare with the database. Interface Wi-Fi module to send alert to authorized person while unlocking the locked door in the form of SMS.

1.1.2 Haar Cascade (Machine learning algorithms)

Each feature is represented by a single value that is derived from the difference between the sums of the pixels in the white and black rectangles. Numerous features are calculated using all available classifier sizes and positions. The computation of arithmetic operations appears to take a lengthy time as the number of classifiers increases. We make advantage of the idea of an integral image to prevent this. Integral images are a type of data structure used in image processing that contains a method for quickly and effectively calculating the sum of values in a subset of a rectangular grid. Integral Image: To solve the complexity Ad boost machine learning algorithm, a cascade classifier incorporated within the OpenCV library, is used to remove classifier redundancy from the number of classifiers employed for calculation. Weak classifiers are those that have a probability of detection that is 50% or higher.
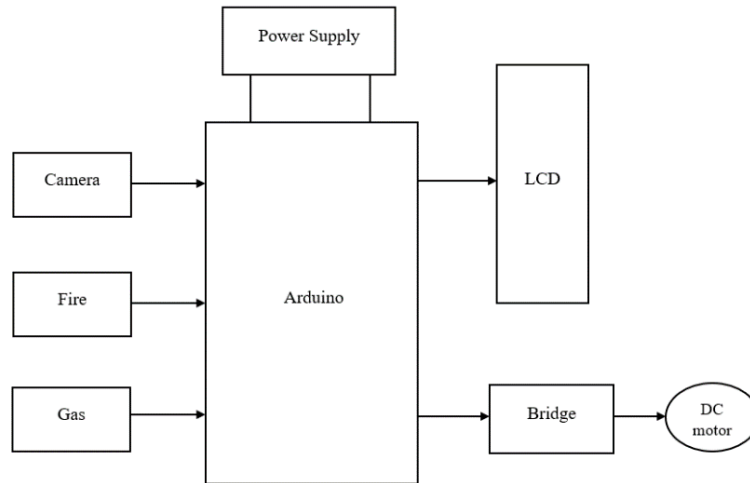
Figure : System Design of the proposed system

1.2 Use Case Diagram

A use case diagram consists of an actor-based network, a set of use cases bounded by a system boundary, communication links between actors and users, and generalisation between use cases.
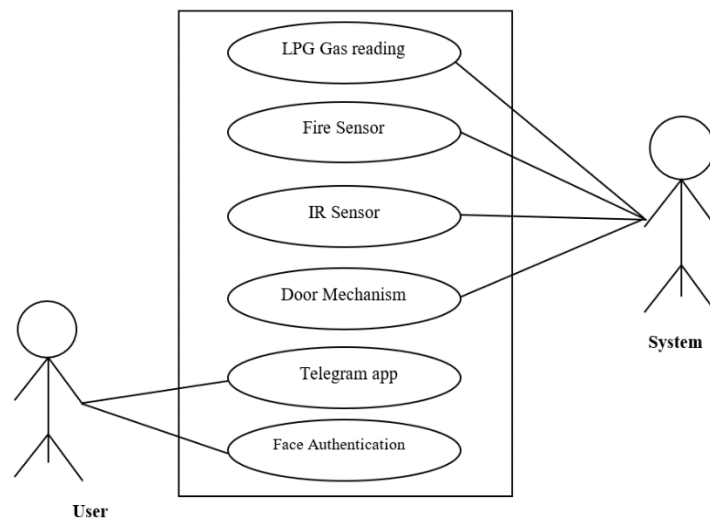

Figure 2:Use Case Diagram

1.2.2 Data Flow Diagram

Data flow diagrams are visual tools for describing and analysing how data moves through a system. These serve as the main resource and serve as the foundation for the creation of the other components.
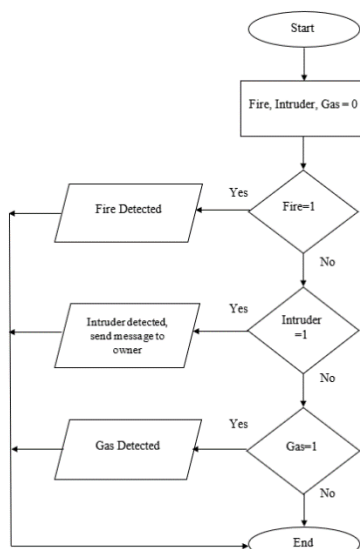
Figure 3:Data Flow Diagram

II. RESULT AND DISCUSSION

The results obtained are as discussed below

1.3.1 Face recognition

The proposed face recognition system overwhelms the current face recognition system's secure bounds. Its foundation is the mathematical manipulation of the values corresponding to the dominant traits that are extracted from a set of human faces kept in the database. Therefore, the primary features are extracted and computed to determine the distance between the input image and the stored photos when a fresh image is fed into the system for recognition. So, it is OK to accept minor modifications in the new face image to be identified. The system will be able to recognise the new face and recognise the person when the new image of a person differs from the photographs of that person recorded in the database.
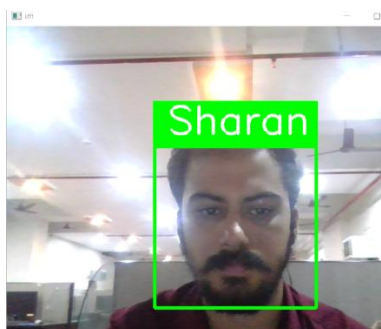

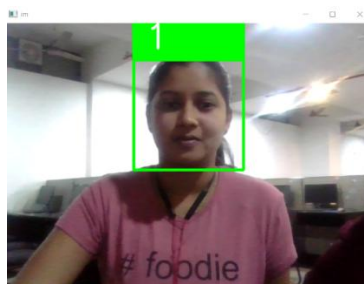**Figure 4: System Recognizing the authorized person**

Figure 5: System recognizing the unauthorized person

1.3.2 OTP process

If Face Didn't Match with Database, Face Intimation will be Sent to Owner through Telegram app and authorized person can give access through OTP.

Figure 6: System alerting the authorized person through telegram app

1.3.3 Door Lock

The motor turns in a clockwise direction to open the door once the info from the face through the camera matches the outline in the data base. This is accomplished by allowing current to passive through to drive the relay which triggers the motor to turn the door open and allow access.
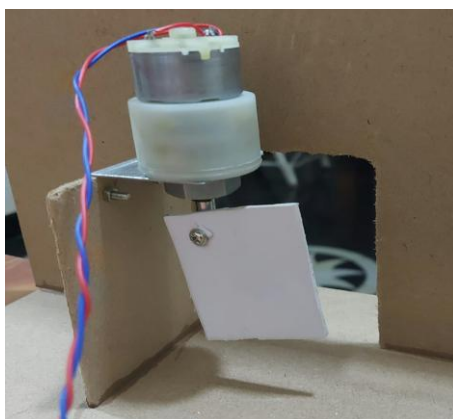

Figure 7: Front Door Mode

III. CONCLUSION

The procedure of a facial recognition system using Arduino board can make the system slight, lighter and work successfully utilizing lower control use. This development scheme is inexpensive, fast, and highly consistent and Arduino takes less power and provides enough flexibility to suit the requirement of different people. It will send a security alert message to the authorized person. If a unauthorized person tries to open the door.

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