FACIAL RECOGNITION BASED DOOR LOCKING SYSTEM

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Abstract

Security describes protection of life and property. The main purpose of this system is to provide better security by using face recognition technique. Eigen face algorithm is a basis for face recognition that provides high accuracy and moderate sensitivity to variations in the intensity of light. It is one of the fastest way to identify faces. This project works in two modes: offline and online. Firstly, the PIR sensor senses the person standing outside the door. Then camera receives instruction to capture image of person standing in front of the door. This captured image is compared to the images stored in the database. The person standing in front of the door will be granted access, if his/her image is recognized. If it's not the authorized person gets a notification via GSM. If the authorized person grants permission, only then the door will open. Or else it will remain closed for further action. This project makes use of Laptop as a processing unit. It uses MATLAB software to carry out the face recognition procedure. The system takes input image by capturing a real time image for online process. For offline process the input image is given manually.

Keyword:- Security, face recognition, PIR sensor, Eigen face algorithm, MATLAB etc

INTRODUCTION:- In today's world of connectivity and smart devices there is an urgent need to modify our existing day to day objects and make them smart, also it is not the era when we can blindly trust the old and conventional security measures, specifically speaking is our door locks. To change and modernize any object we need to eliminate its existing drawbacks and add extra functionality. Face detection is more challenging because of some unstable characteristics, for example, glasses and beard will impact the detecting effectiveness. An intensive study of OpenCV platform and its inbuilt libraries has been conducted to generate a code, which does correct and reliable facial recognition with new and efficient use of hardware. This proposed system also acts as a home security system for both Person detection and provide security for door access control by using facial recognition for the home environment. The human body is identified as an intruder within a home environment achieved by capturing live video from web camera and processing will be done on captured video frames. The advantage of this system is for accessing the door is that face detection and recognition are performed by using face detection technique. Face recognition includes feature extraction from the facial image, recognition or classification and feature reduction. As the world is progressing people are scared about the safety of their possessions, information and themselves. With the model of Smart Door, a profound impact is expected in the security industry and it is somewhat anticipated as the time has come to make all daily life objects interconnected and interactive. This model will be a major contribution to the field of Home Security.

Literature Survey:- Currently, the number of thefts and identity fraud have frequently been reported and has become significant issues Traditional ways for personal identification requires external element, such as key, security password. RFID card, and ID card to have access into a private asset or entering public space. Many processes such as drawing out money from banks requires password. Other such parking in private space would also need parking ticket. For some houses, the house key is very important. However, all this method also has several disadvantages such as losing key and forgetting password. When this happens, it can be hassle to recover back. This method is slowly taken over by biometric methods as it is the possible way to solve those problems. This technique required to use the special hardware such as s fingerprint scanner, palm print scanner, DNA analyzer to gather

information for the vast majority of the biometric applications and the target objects have to touch with the hardware to acquire information.

As biometric is a technique that distinguishing physical high lights of people accordingly it has an extensive variety of utilization in security frameworks and it is viewed one of the most secure methods. Basically, biometrics can be classified in two categories which are physical and behavioral Recently, the face recognition technology has engaged an overwhelming number of researchers and it is gradually supplanting other biometric security frameworks. Face recognition is also known as image matching. It is a rapidly growing field where it is heading in a direction such that it will replace the traditional method. Face recognition is more stable among others biometric identification method as it is using the human face that results in high accuracy, lowest false recognition rate and it does not change in people's life. This this method is much practical for a lot of usage, including face recognition for the unlocking house door.
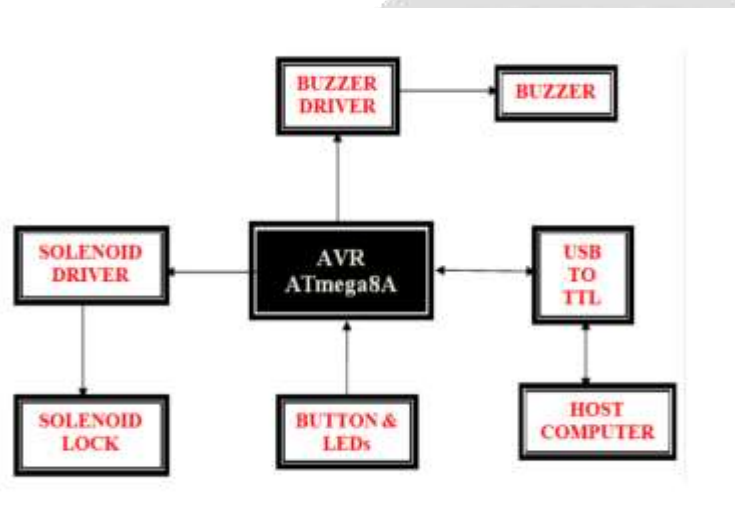
BLOCK DIAGARAM

 Fig. 1 Block diagram of the Proposed System

Hardware Consist of the following are

1 AVR Microcontroller (ATmega8A)

2 DC SMPS (12v 1.5A)

3 DC Jack (DC Jack Mountable)

4 MOSFET (P55NF06)

5 BJT (BC547)

6 Diode (1N4007)

7 USB-TTL (PL2303)

8 Regulator IC (LM7805)

9 Solenoid (Solenoid Lock 12v)

10 PCB

11 LEDS

12 Micro Switch (2-Leg Push-To-On)

13 Wire Bundle

14 Resistors

15 Capacitors (1000uF)

16 Buzzer (5v)

 17 Heat Sink

18 IC Base

Methodology:-

Face recognition door lock system uses camera to capture image which is connected to the microcontroller for face recognition. If the image is known door will open and if the image is unknown then it will send the image to the website where owner of the house will decide based on the image whether to open the door or not. If the bell is pressed, it activates the camera which captures the image. The image captured is checked against images in the database. If the image matches then the door will be opened and if the image is not recognized then the image of the person is sent to the owner of the house can lock or unlock the door. Login credentials are provided to the owner of the house by which he/she has to login and get complete access to the door lock mechanism. Ones we system is turned on for the first time. LCD display will show you three options: 1. Registration 2. Start 3. clear data For the first time, we have to select first option i.e. Registration. When we click on the Registration, camera will open and it will capture images of owner and save it in database. Now, as the owner images are stored in database, we can start the system by selecting second option i.e Start When we click on start, system will boot up and now if owner presses the bell, camera will recognize the face of the owner and it will open the door without any human intervention.

CIRCUIT DIAGRAM:-
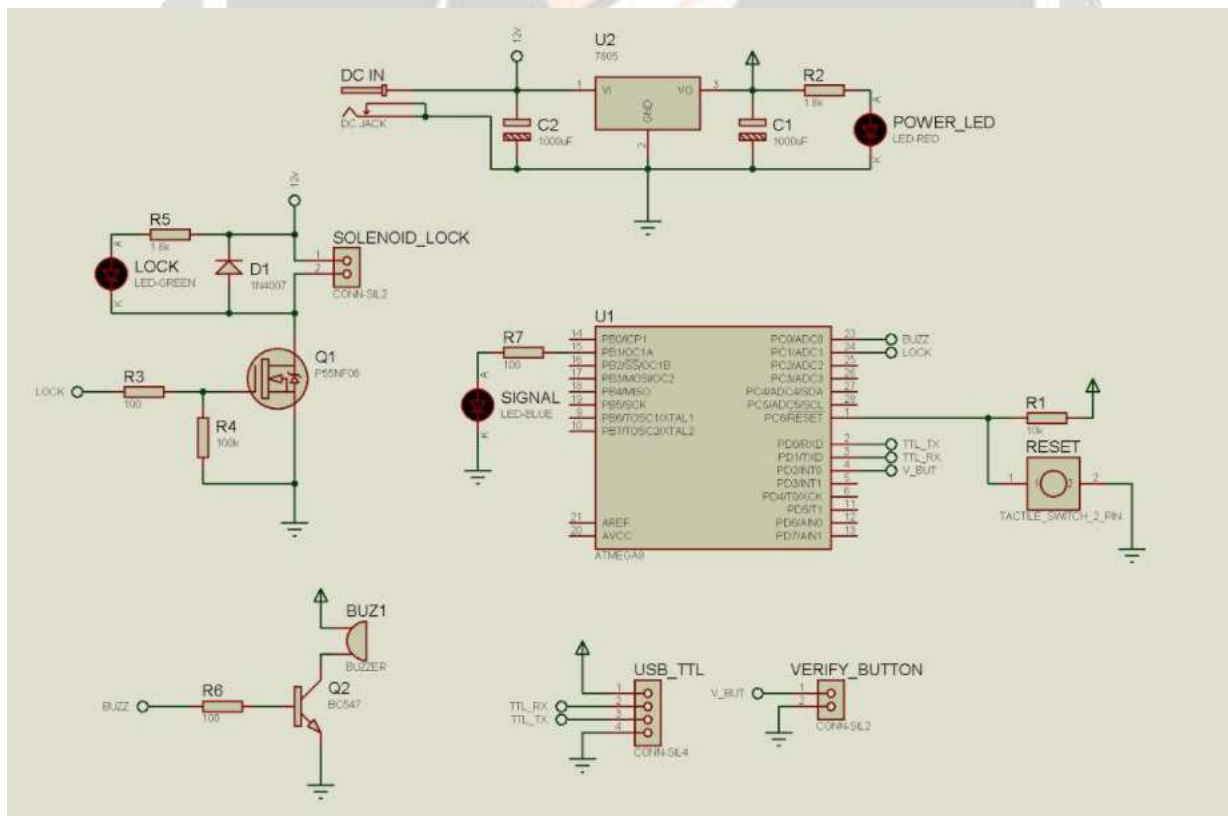
V. RESULT AND DISCUSSION

In this section, the output of the training stage. experiment on face detection, and experiment of face recognition will be elaborated. The performance evaluation includes recognition rate, reliability, memory management, and power management.

VI. CONCLUSION

Face recognition based door locking has been developed to provide better security. It is user friendly system. The use of Eigen face recognition technique makes system more secure. This system can be used in several places where high security is required where confidential information and equipment is kept. For example, research institutes, banks, forensic Laboratories. This system can also be used for domestic purposes. This project helps to reduce problem of thefts and frauds. In case of unauthorized person's entry, system alerts authorized person with SMS and at the same time the buzzer beeps to alert people. This is a cost efficient and reliable door locking system**.**

VII. FUTURE SCOPE

The In future, this system can be changed into double verification mechanism such as retina scanner, fingerprint scanner, OTP, PIN Code, etc. This system will first recognize the face and if face is found in the database then it will ask for second verification mechanism will may be any one of the above and if the person passes both the verification test then only door will open and if face is not found in the database the image will be sent to website. This system will provide excellent security. The face recognition mechanism can be combined with any other.

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