IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

APPENDIX Smart Security System with Face Recognition Using IOT

D. Swathi

Assistant Professor

Dept of Electronic & Communication Engineering

TKR College of Engineering and Technology, Meerpet

ABSTRACT:

Over the course of last decade, home security and automation systems have been gaining extreme popularity because of the enhancement in the field of science and the concomitant risks of breaking in the system. This paper envisions a smart home based on the two independent and emerging technologies via face recognition for the security purposes. Security system ensures the working of the smart home by taking the image on the ringing of the bell and comparing it with the stored database of owners in a robust and reliable manner through microcontroller. Privacy and Security are two of the most important universal rights. To ensure security in our daily life through technology, a lot of research is going on. Among them facial recognition is a popular and well-established technology. In this technology, faces are detected and identified out of images and with the help of Internet of Things (IoT), it becomes even more useful and precise. Using face recognition and IoT, we aim to create a smart door, which secures the gateway on the basis of who we are. In our proof of the concept of such a smart security system, we have used Viola-Jones method to detect faces and Eigenfaces method to recognize people. A microprocessor has been used as for ensuring low-cost and small size of the system.

Keywords: Microprocessor, ESP32 CAM, Door lock, Relay, IOT

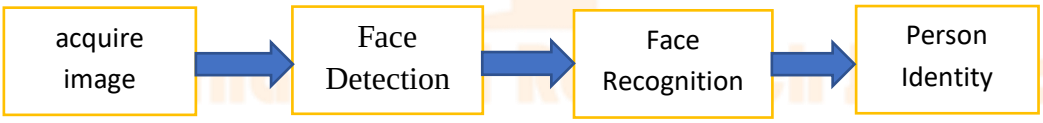
INTRODUCTION:

Human face detection is often the first step in applications such as video surveillance, human computer interface, face recognition, and image database management. The aim of face detection is to classify the segment of image as face or non-face (background of image). The task of describing the human face is difficult due to

the fact that the image varies based on external factors like viewpoint, scale, different individual, occlusion, lighting, environmental conditions and internal factors like facial expression, beard, moustache, glasses.

Face recognition system is a complex image-processing problem in real world applications with complex effects of illumination, occlusion, and imaging condition on the live images. It is a combination of face detection and recognition techniques in image analyzes. Detection application is used to find position of the faces in a given image. Recognition algorithm is used to classify given images with known structured properties, which are used commonly in most of the computer vision applications. Recognition applications use standard images, and detection algorithms detect the faces and extract face images which include eyes, eyebrows, nose, and mouth. That makes the algorithm more complicated than single detection or recognition algorithm.

The first step for face recognition system is to acquire an image from a camera. Second step is face detection from the acquired image. As a third step, face recognition that takes the face images from output of detection part. Final step is person identity as a result of recognition part. An illustration of the steps for the face recognition system is given in Figure . Acquiring images to computer from camera and computational medium (environment) via frame grabber is the first step in face recognition system applications. The input image, in the form of digital data, is sent to face detection algorithm part of a software for extracting each face in the image. Many methods are available for detecting faces in the images. Briefly, knowledge-based methods are derived from human knowledge for features that makes a face. Appearance-based methods are derived from training and/or learning methods to find faces.



Applications After faces are detected, the faces should be recognized to identify the persons in the face images.

Existing System:

Face recognition System can't monitor Real time, it is the major disadvantage of the system. It can't alert the owner. A facial recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces. Such a system is typically employed to authenticate users through ID verification services, and works by pinpointing and measuring facial features from a given image. Facial recognition systems are employed throughout the world today by governments and private companies. Their effectiveness varies, and some systems have previously been scrapped because of their ineffectiveness.

Proposed System:

Security system has now in advance stage. Face recognition using IOT has a major change it can be Real time monitoring and alerting the person through the sending notification, owner has monitor system any time it can work also CCTV. facial recognition systems have seen wider uses in recent times on smartphones and in other forms of technology, such as robotics. Because computerized facial recognition involves the measurement of a human's physiological characteristics. Although the accuracy of facial recognition systems is improved high in recognition, it is widely adopted due to its contactless process

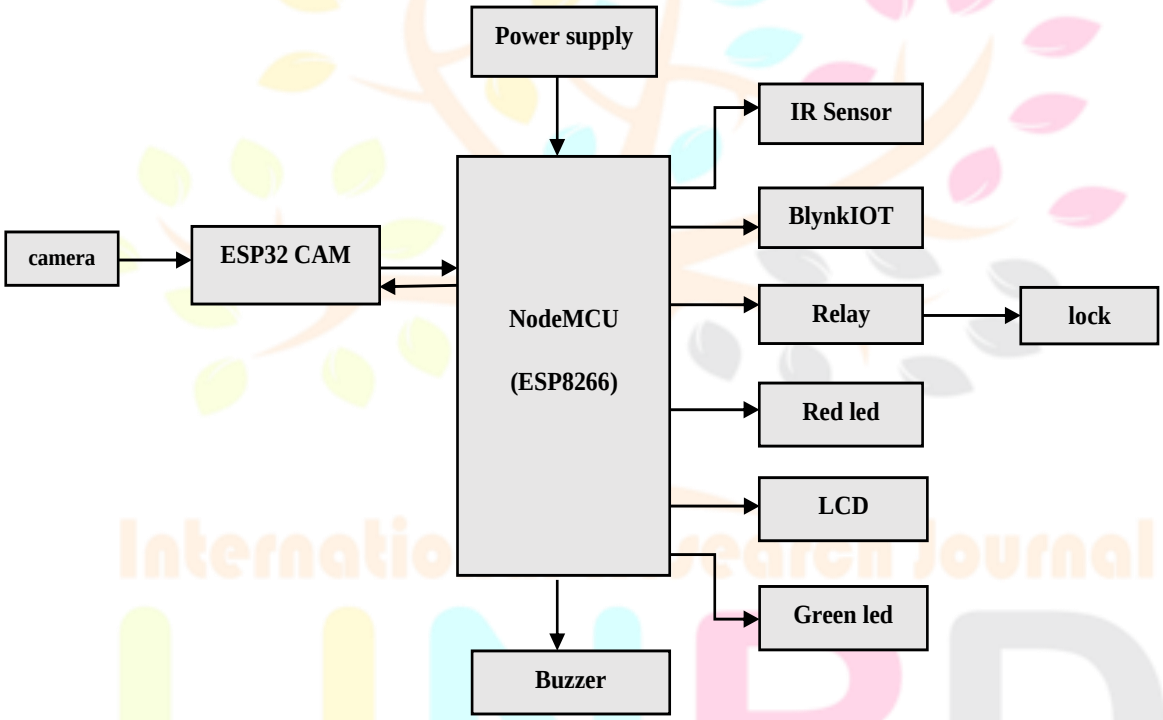


Fig: Block Diagram

Working:

This section presents the system overview, design, and implementation details. The specification of the smart security system with face recognition using IOT.It monitor the person face and send data to NODEMCU it will detect the person face which is already stored in a ESP32CAM,if person is known person it will open the door lock. For unknown person, if the unknown person is detected NODEMCU send back to ESP32CAM it can't

open door lock and simultaneously send notification to owner through Blynk IOT server app. IOT devices can use the facial recognition with extreme precision in milliseconds. By using Blynk IOT app owner has access to Lock and Unlock the door and camera monitor all the time, owner can also type a message to person on the LCD display.

1. **ESP32 CAM:** It store the data and send to NodeMCU. It has a inbuilt wi-fi module and Storage with 4MB ROM and 32KB RAM. ESP32-CAM is a advance development board with Wi-Fi camera. It allows creating IP camera projects for video streaming with different resolutions.

2. **NODEMCU:** It is a 32-bit microprocessor with 16 GPIO pins,12 Data pins,1 UART,1 SPI. It works at 5V power, with wi-fi frequency 2.4 GHZ, 1 analog input pin and 1 **I_2C** pin.

3. **RELAY:** Relay which is act as a switch and it give 12V power to the lock. Relay is also a switch that connects or disconnects two circuits. But instead of manual operation a relay is applied with electrical signal, which in turn connects or disconnects another circuit.

4. **BLYNK IOT:** It is a server, used for the send notification to the owner and real time monitor through the app. It provides High Security Service and Server for IOT applications.

CONCLUSION:

Five different methods in face detection and recognition have been reviewed namely, PCA, LDA, Skin Color, Wavelet and Artificial Neural Network. There are four parameters that are taken into account in this review, which are size and types of database, illumination tolerance, facial expressions variations and pose variations. From this independent review, please note that the results a typical and variant as they correspond to different experiments or studies done by previous researchers. Thus, no specific justification can be made as a conclusion on which algorithm is the best for specific tasks or challenge such as various databases, various poses, illumination tolerance and facial expressions variations. The performance of the algorithms depends on numerous factors to be taken into account. Instead of using these algorithms solely, they can be improved or enhanced to become a new method or hybrid method that yields a better performance.

REFERENCES:

[1] CHELLAPPA, R., WILSON, C.L., and SIROHEY, S. (1995). Human and machine recognition of faces: A survey. In Proceedings of IEEE. Vol. 83, No. 5, Page. 705–740.

[2] WECHSLER, H., PHILLIPS, P., BRUCE, V., SOULIE, F., and HUANG, T. (1996). Face Recognition: From Theory to Applications. Springer-Verlag.

[3] ZHAO, W., CHELLAPPA, R., ROSENFELD, A., and PHILLIPS, P.J. (2000). Face Recognition: A Literature Survey. CVL Technical Report, University of Maryland. Retrieved from <ftp://ftp.cfar.umd.edu/TRs/CVL- Reports-2000/TR4167-zhao.ps.gz>.

[4] GONG, S., Mckenna's., and PSARROU, A. (2000). Dynamic Vision: from Images to Face Recognition, Imperial College Press and World Scientific Publishing.

[5] Retrieved on 16 April 2009 from http://www.xidtech.com/our_news_2008.htm.

[6] PENTLAND, A., MOGHADDAM, B., and STARNER, T. (1994). View-Based and Modular Eigenspaces for Face Recognition. In Proceedings of IEEE Conference on Computer Vision and Pattern Recognition. Page. 84-91.

[7] DONATO, G., BARTLETT, M., HAGER, J., EKMAN, P., and SEJNOWSKI, T. (1999). Classifying Facial Actions. In Proceedings of IEEE Transactions on Pattern Analysis and Machine Intelligence. Vol. 21 No. 10, Page. 974–989.

[8] LIN, S.H. (2000). An Introduction to Face Recognition Technology. Informing Science on Special Issue on Multimedia Informing Technologies.Vol.3, Part 2, No. 1.

[9] YANG, M.H.,KRIEGMAN, D.J., and AHUJA, N. (2002).Detecting Faces in Images: A Survey. In Proceedings of IEEE Transactions on Pattern Analysis and Machine Intelligence.Vol.24, No. 1, Page. 34-58.

[10] TURK, M., and PENTLAND, A. (1991). Eigenfaces for Recognition. Journal of Cognitive Neuroscience. Vol. 3, No. 1, Page. 71-86.