International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 06 | Jun 2022 www.irjet.net p-ISSN: 2395-0072

Bank Locker System Using Fingerprint Authentication & Image Processing

Dipti Balasaheb Gaikwad [1], Rutuja Deepak Sabade [2], Prof. Pachhade R. C.[3]

[1,2]Students of Computer Engineering,
Vishwabharati Academy's College of Engineering, Ahmednagar, India.
[3]Professor of Vishwabharati Academy's College of Engineering, Ahmednagar, India

---

Abstract - *Nowadays, bank and locker theft are frequently circumstance this means our locker is vulnerable to robbery since it has no ultimate solution rather than a lock and key. Currently, many of the banks use two secret keys to open the lockers. One key is with the user and another key is with the bank person. This system is having many drawbacks. There is a chance of losing the key which make the system to be insecure and copy of keys may lead to unauthorized access of the locker. So in order to overcome that we are introducing Locker Security System based on Face Recognition and fingerprint technology, which can be used in Banks, Security Offices and Homes for giving protection to expensive possessions. In this system, only the authorized person can access the valuable things like money, licenses and jewels from locker. Face Recognition is done by using active appearance model algorithm with CNN prediction, which is used to identify the persons and verify their identity with the Raspberry Pi processor. Fingerprint or biometric technologies are combined together for accessing the locker securely. When an authorized person tries to access the locker, the system will shows unauthorised access. If he does any offensive acts on the locker, it will be sensed by the fingerprint sensor and the sensor will send the control signal to Raspberry pi processor and it will generate unauthorized access.*

Key Words: Raspberry pi, face recognition, biometric, fingerprint.

INTRODUCTION

Security is of primary concern and in this busy, competitive world, human cannot find ways to provide security to his confidential belongings manually. Instead, he finds an alternative which can provide a full-fledged security as well as atomized. In the ubiquitous network society, where individuals can easily access their information anytime and anywhere, people are also faced with the risk that others can easily access the same information anytime and anywhere. Because of this risk, personal identification technology, which can distinguish between registered legitimate users and imposters, is now generating interest.

Raspberry Pi is a credit-card sized computer manufactured and designed in the United Kingdom by the Raspberry Pi foundation with the intention of teaching basic computer science to school students and every other person interested in computer hardware, programming and DIY-Do-it Yourself projects. The Raspberry Pi is manufactured in three board configurations through licensed manufacturing deals with Newark element14 (Premier Farnell), RS Components and Egoman. These companies sell the Raspberry Pi online. Egoman produces a version for distribution solely in China and Taiwan, which can be distinguished from other Pis by their red coloring and lack of FCC/CE marks. The hardware is the same across all manufacturers. The Raspberry Pi has a Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZF-S 700 MHz processor, VideoCore IV GPU and was originally shipped with 256 megabytes of RAM, later upgraded (Model B & Model B+) to 512 MB. It does not include a built-in hard disk or solid-state drive, but it uses an SD card for booting and persistent storage, with the Model B+ using a MicroSD. The foundation provides debian and arch linux arm distributions for download. tools are available for python as the main programming language, with support for bbc basic (via the risc os image or the brandy basic clone for linux), c, java and perl.

Currently, passwords, Personal Identification Numbers (4-digit PIN numbers) or identification cards are used for personal identification. However, cards can be stolen, and passwords and numbers can be guessed or forgotten. To solve these problems, face recognition and biometric authentication technology which identifies people by their unique biological information is attracting attention. Biometrics can be defined as recognizing and identifying a person based on physiological or behavioral characteristics. In biometric authentication, an account holder's body characteristics or behaviors (habits) are registered in a database and then compared with others who may try to access that account to see if the attempt is legitimate. Fujitsu has researched and developed biometric authentication technology focusing on the methods: fingerprints, faces, voiceprints.

LITERATURE SURVEY & METHODOLOGY

Siddique Reza Khan and et al. Have proposed a system contains sensors to detect obstacle, touch, heat, smoke, sound. The whole system is controlled by a PIC microcontroller 16F76. It collects information from the sensors, makes a decision and sends SMS to a corresponding number by using a GSM modem. If it finds any interruption in its sensors like if the IR is interrupted then PIC will send a SMS to the home

owner and another SMS to the Police Station. In the same way for fire interruption a SMS will be sent to the fire brigade and another to the home owner. In this system require extra hardware components like Sensors, GSM Modem. Alerts are sent through only SMS.

B. Udaya Kumar and et al. presents the implementation of a low-cost wireless home security system using ZigBee protocol and remote access through internet. A ZigBee based star network with two nodes had been established employing Xbee radio, ARM7, PIC, and MBED microcontroller. The detection of the intruder motion, gas leakage detection and visual surveillance of the home were provided with the help of Passive Infrared Sensor (PIR), Gas sensor (GH-312) and Camera (LS_Y201). Problem is here multiple micro controllers are used; usage of ZigBee based network to communicate with the base station is limited to 100-150 meters long distance only. Base station is dependent on only Ethernet for internet connectivity

J. Shankar Kartik and et al. Have developed systems, where one is based on GSM technology and other uses USB camera to detect the attacker. The first security technology uses a USB camera, installed in house place, which is handled by software installed on the PC and it uses Internet for transfer data. The camera fetch motion of any attacker in front of the camera range or camera dimension. The software info to the deliberate user via Internet network and at the same time it gives sound alert. The second security techniques is SMS based and uses GSM system to send the SMS to the owner. Mae. Y and et al. presented the technology; it detects everything by moving cameras. The technology can increase the output of detecting and can eliminate the blind dots of fixed cameras. In this technology, a mobile manipulator is designed which is equipped with cameras at the arm end for purpose of monitoring.

In many ways, users used to lock their doors to be safe from soft lifter or other users. There are many home and other security access control technology such as keys, Barcode ID, or another technology any unauthorized person can enter there. But on time the face recognition technology, the face data are stored on Linux operating system based Raspberry pi and it'll compare real-time with the users are coming before the webcam. Raspberry Pi3 has been used because it's a debit card sized computer that may work faster than other huge size computers as a result the project will take a tiny low area but work effectively.

PROPOSED METHODE

This proposed system shows of the report will include the proposed work as to how the system has been working out showing the Hardware used, Software's used, and Algorithms utilities with respect to machine learning part of the project and working of the project. In order to make this system development running smoothly and complete in dedicated period, the project is divided into five steps which started with project planning, hardware development and software development. After that it's followed by simulation and lastly, build the prototype. When a person wants to open the locker, he/she has to keep their face in front of camera, then the camera will recognize their face if they are authenticated person or not. After that user should put their thumb on fingerprint sensor to check the unauthorised access. If they are authenticated person then the locker will open, if no then it will shows unauthorized access.

1. Raspberry Pi Camera: used for to take the Driver Face image.

2. The first stage of any vision system is the image acquisition stage. After the image has been stored, various techniques of processing can be done to the image to perform the many different newest tasks required today.

3. The images used in the analysis are in large sized in different scales to obtain how various sizes impact the recognition process. Different image sizes carry different data that's why the best image size needs to be examined in details. The purpose of image resizing is to produce a lower data size, which hastens the processing speed. The resize scale randomly varies from 0.1 to 0.9 points, which produces different image sizes.

4. This step consists of capture image; recognize faces in the image, feature extraction, template comparison, and declaration of matching template.

5. Register the peoples with the help of thumb expression detection or biometric detection.

6. Make the locker and finger based system for particular user to their perspective locker.

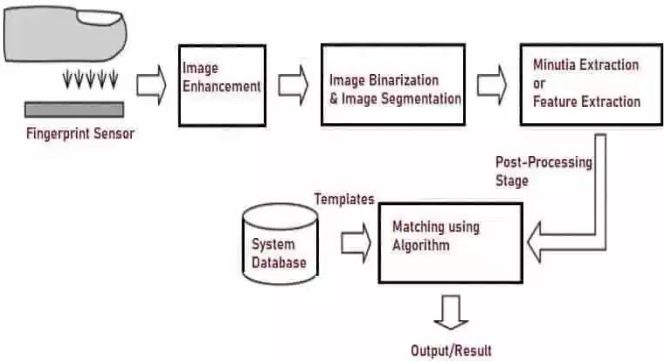

Fig: System Architecture

SYSTEM WORKING

This paper is presenting a proposed work of an automated image Capture sys- tem using) using Raspberry pi camera . This work is experimented on user face we have to used classification methods, viola jones, CNN convolution neural networks algorithms, etc. But improvements are expected to

increase its efficiency of classification. This techniques automatically detects the peoples face and detect the by recognizing their face. This system is designed by capturing real time peoples faces. The detected faces are matched against the reference faces in the dataset and detect the user. Also user will identified fingerprint of user for more security.

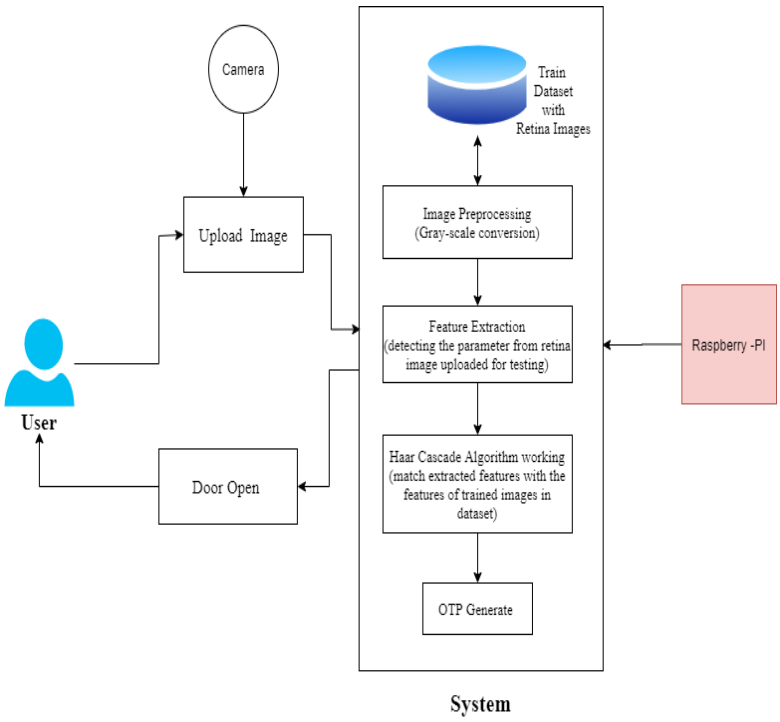

Fig: Proposed face detection system

CONCLUSION

This project focuses on developing an automated system for lockers. It saves time and effort, especially if it has huge number of person. It can be extended to video surveillance to detect person at crowded areas such as bus stands, theatres, railway stations where in by face recognition and thumb based techniques, the identity of the culprits can be found. Face detection is a challenging issue in the field of computer system, which has received a great deal of attention over the past years because of its several systems in various domains. Although research efforts have been conducted vigorously in this area, achieving mature thumb recognition systems for operating under constrained conditions, they are far from achieving the ideal of being able to perform adequately in all various situations that are commonly encountered by applications in the real world.

REFERENCES:

1. B. Quintana, S. A. Prieto, A. Adan, and F. Bosche, "Door detection in 3D colored laser scans for autonomous indoor navigation," in 2016 International Conference on Indoor Positioning and Indoor Navigation (IPIN). IEEE, oct 2016, pp. 1–8
2. Llopart, O. Ravn, and N. A. Andersen, "Door and cabinet recognition using Convolutional Neural Nets and real-time method fusion for handle detection and grasping," in 2017 3rd International Conference on Control, Automation and Robotics (ICCAR). IEEE, apr 2017, pp. 144–149.
3. Axelrod and W. H. Huang, "Autonomous door opening and traversal," in 2015 IEEE International Conference on Technologies for Practical Robot Ap- plications (TePRA). IEEE, may 2015, pp. 1–6.
4. Y. Karayiannidis, C. Smith, F. E. V. Barrientos, P. Ogren, and D. Kragic, "An Adaptive Control Approach for Opening Doors and Drawers Under Uncer- tainties," IEEE Transactions on Robotics, vol. 32, no. 1, pp. 161–175, feb 2016.
5. Hteik Htar Lwin, Aung Soe Khaing, Hla Myo Tun, Automatic Door Access System Using Face Recognition International Journal Of Scientific Technol- ogy Research,Issue 06, Volume 4,June 2015.
6. Ilkyu Ha, Security and Usability Improvement on a Digital Door Lock System based on Internet of Things, International Journal of Security and Its Applica- tions Vol.9, No.8 (2015), ISSN: 1738-9976.
7. Neelam Majgaonkar, Ruhina Hodekar, Priyanka Bandagale, Automatic Door Locking System, International Journal of Engineering Development and Re- search, 2016 IJEDR , Volume 4, Issue , — ISSN: 2321-9939.
8. Prathamesh Timse, Pranav Aggarwal, Prakhar Sinha, Neel Vora, Face Recog- nition Based Door Lock System Using Opencv and C with Remote Access and Security Features, Int. Journal of Engineering Research and Applications, Vol. 4, Issue 4(Version 6), April 2014, ISSN : 2248-9622. 9. Ylber Januzaja , Artan Luma