REAL TIME CRIMINAL DETECTING SYSTEM Using Raspberry pi

G.Nagalakshmi[1]D.Indu Bhargavi[2] G.Nandini[3] P.G.K.Sirisha[4]

[1,2,3] B.Tech Students[4]Associate Professor
[1,2,3,4]Computer Science and Engineering
[1,2,3,4]KKR & KSR Institute of Technology and Sciences, Guntur

---

Abstract: Now-a-days, crime rates are increasing at an alarming rate. It is equally important to catch the thief and to prevent theft. Most of the time, thief escapes due to delay in action taken by concerned authorities at that time. In this paper, we present the design of a security system which solves this problem. Our aim is to detect criminal in the public places and shopping malls and provide information to the nearby police stations and user and gather information about person that whether the person is a wanted criminal or not. For this we gather information of the criminals from police and store the images in Database. We match the captured image with the database and find the similarities and If 80% of the image matches with person then we will send alert message to the user, this is done by image processing.

Keywords: Face detection, Face recognition, Raspberry pi, IOT, Python, Image processing.

1.INTRODUCTION

Recently, many cases have been filed under thefts/Crimes. In this paper, we have implemented a new system of criminal detection using face recognition which gives us the detailed image of the criminal and it also detects the faces which we have already kept in our database. As we all know, face detection is very useful in the detection of criminal which has a very large use in security related issues in real world scenarios. For this, we will first train the system with known faces which consists of many photographs of criminals taken from police and we will train it from different angles in order to establish the code needed to recognize the criminal from all directions. If the criminal has entered into our system then we will get a message from IOT devices and If any criminal is recognized by the system, the system will give a message to the owner that criminal has been detected. If it is a person who is not in database enter into the system, it will keep a record of all the timings of his/her entry, which will be helpful for future reference and will not deliver a message to the owner.

2. EXISTING SYSTEM

The existing CCTV's are able to capture the videos and images[1] but not able to intimate at the time when it find any criminal. Only after getting intelligence reports the Police department is going to check whether that criminal is at the town or not.

3. PROPOSED SYSTEM

Image Processing is a technique to enhance raw images received from Mat lab database and pictures in the database matches normal day-to-day life for various applications. By using this image processing technology and Mat lab database we can gather information from public places and by analyzing that data/information, by observing the collected data. We can conclude the criminal is wanted or not. And we will provide necessary information and also provide information required to reduce the crime rate in public areas.

In the proposed system all the criminal images are sliced before hand and kept ready for instant viewing. Since the images are preloaded into the system the images can be randomly viewed thus making the system more effective. Every sliced image will be linked to the original image and details of the criminal.

4. MODULES

Our system consists of three modules. They are namely

- Face detection
- Face Recognition (Data Base Matching Purpose)
- Sending message

Face Detection: By using this module, a camera is used to capture the images of the people. This is done Using OpenCV With Haar Cascade Classifiers[2].

Face Recognition (Data Base Matching Purpose): In database there will be criminal images with their information and the captured image matched with images present in the database. This is done by LBPH (Local Binary Patterns Histograms) Algorithm[3].

Sending message : If the captured image matches with the any of the image in the database then the message will be sent to the user with the blink app.[4]

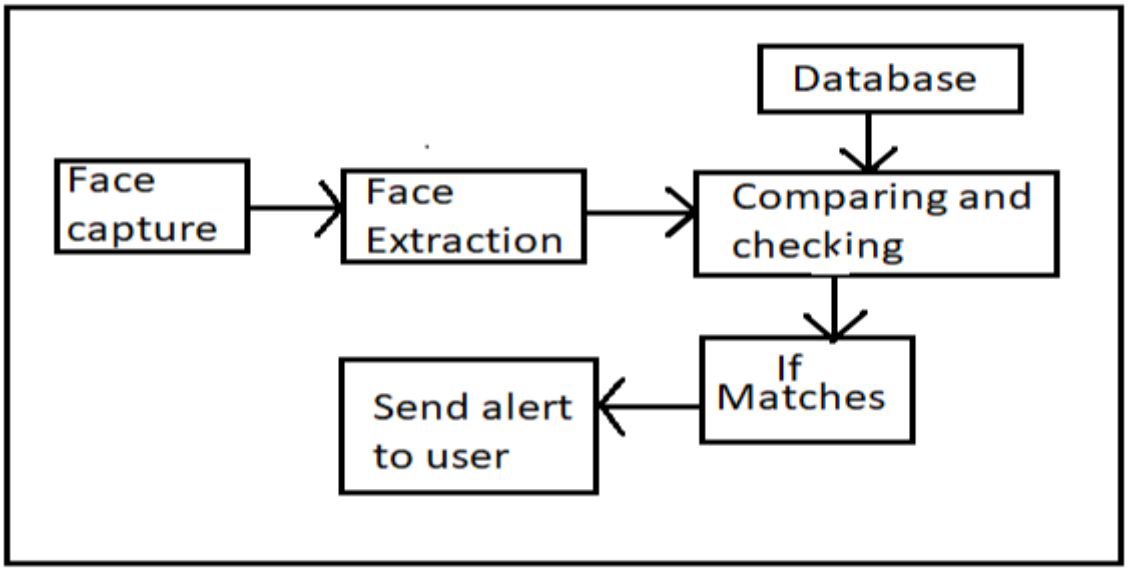

Fig-1: System's Overview

5. ALGORITHM USED

We are using LBPH (Local Binary Pattern Histogram) face recognizer to recognize the faces of all the persons. This is stored in the form of matrix of pixels. These can be solved by using Eigen values and Eigen vectors. We treat the image in the form of matrix as the vector for the verification of the face. The Eigen faces maximizes the total scatter which is very helpful for the identification of the faces, and to preserve some discriminative information, we applied a linear discriminant analysis and optimized.

6. ARCHITECTURE

Camera is attached to a raspberry pi. Any type of camera can be used, preferably camera with motion detection or an infra-red sensor can be used for motion detection. Each raspberry pi is connected to a single server. This server will have all the trained dataset of criminals. When motion is detected, the code inside starts recognizing faces. Camera captures image and that is matched with database images and if matched an alert message will be sent to the user.

Functional Architecture: This involves collection of data, training and recognition.

1) Data collection: criminal information was taken the police.

2) Data Training: Collected data is analysed and then stored. Followed algorithm is Local binary pattern histogram. Python library used here is PIL.

3) Recognition: Here the face captured by camera is matched within the existing data set created during training process. Incase face matches, the user gets alert messag. Libraries used here Opencv and numpy.

Things needed here are numpy library[5] , opencv library[6] ,PIL library[7] , Python idle[8]. Hardware Architecture: Camera, raspberry pi[9] , active internet connection and pc.

7.FLOW CHART

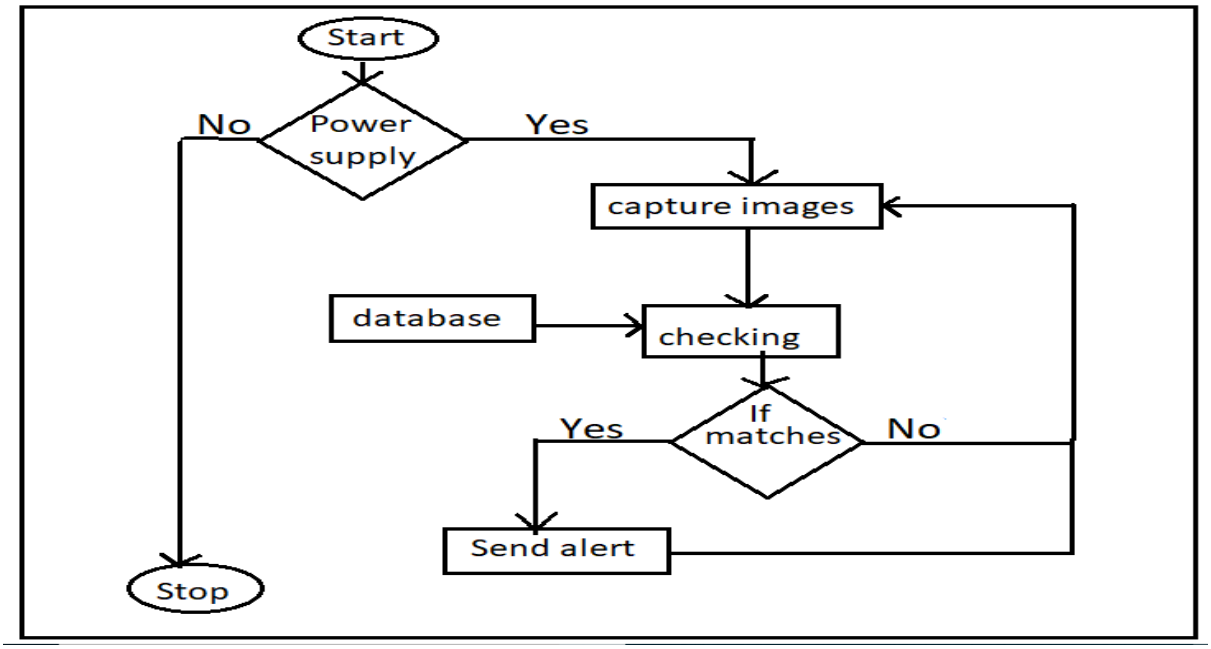

Fig-2: Process of project

8. RESULT

Fig-3: Dataset

The Database taken from police and these images trained to our system. There will be same person image in many different angles.

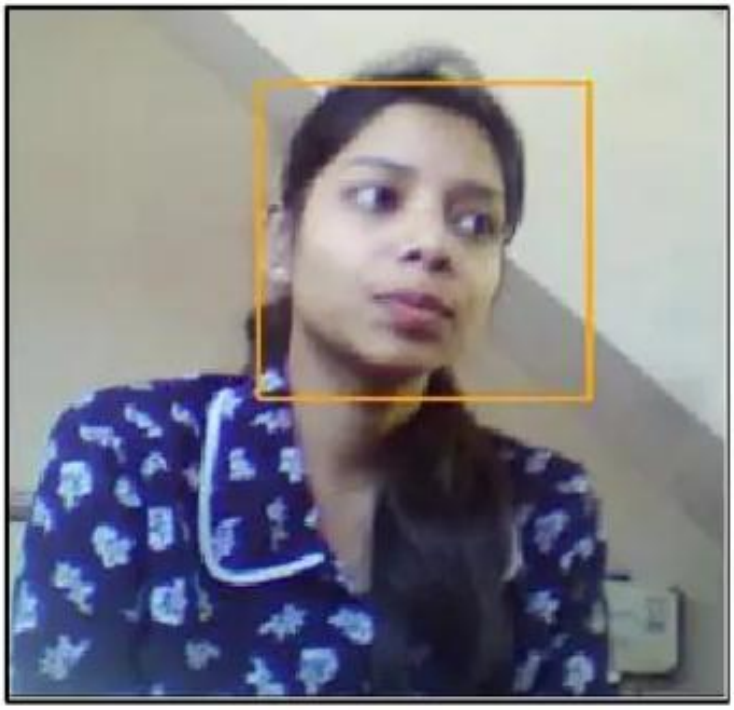

Fig-4: Face Detection

The camera captures images and that faces are detected using Open CV and it shows box indicating the face detection.

Fig-5: Normal person

When normal person's face who is not in database is detected it shows green box and alert will not sent.

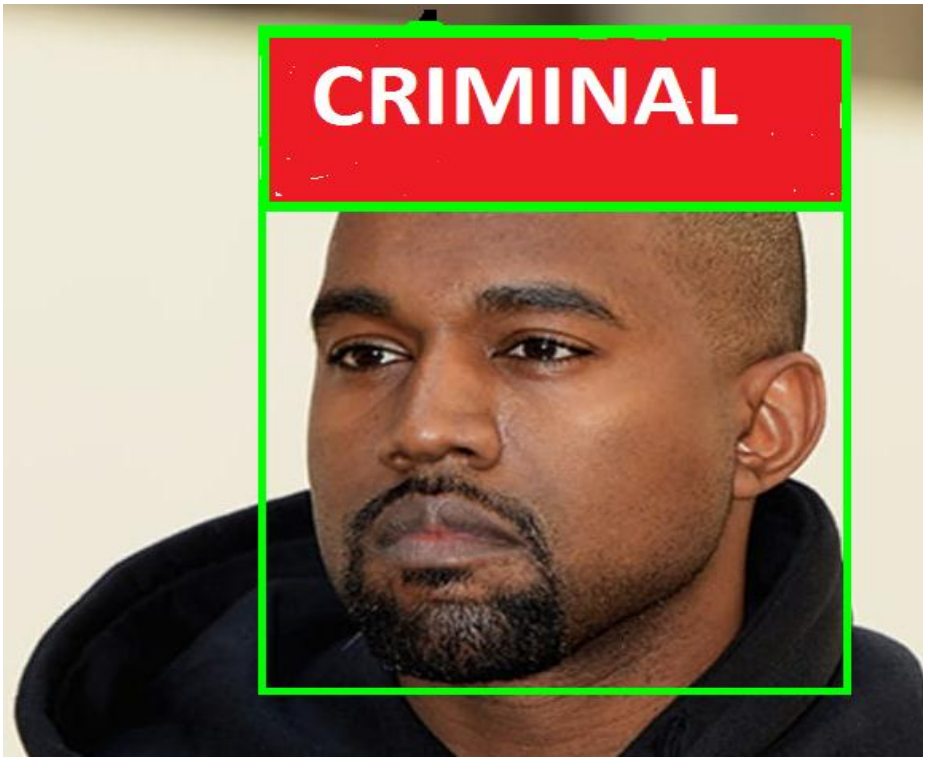

Fig-6: Criminal

When the criminal face is detected ,which is in database then, it shows criminal and message alert will be sent to user.

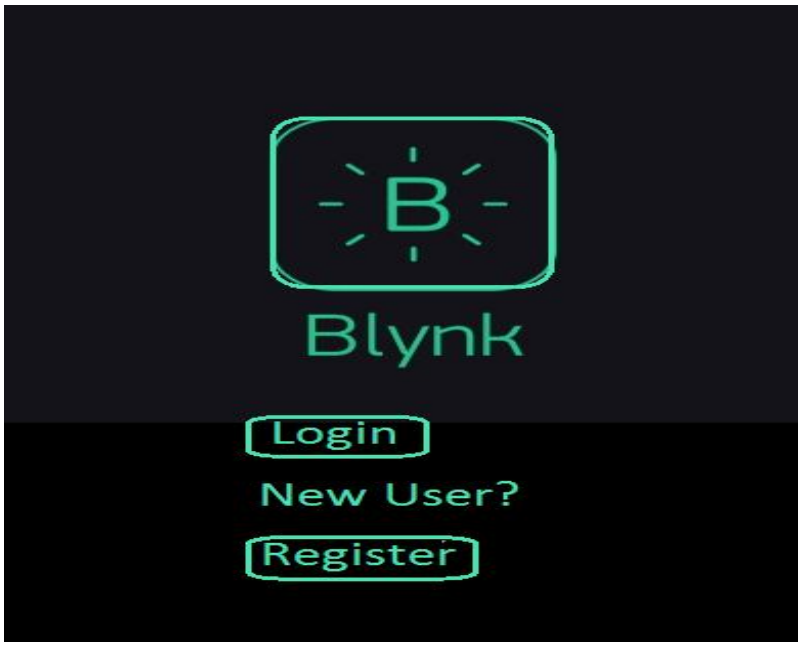

Fig-7: Blynk app

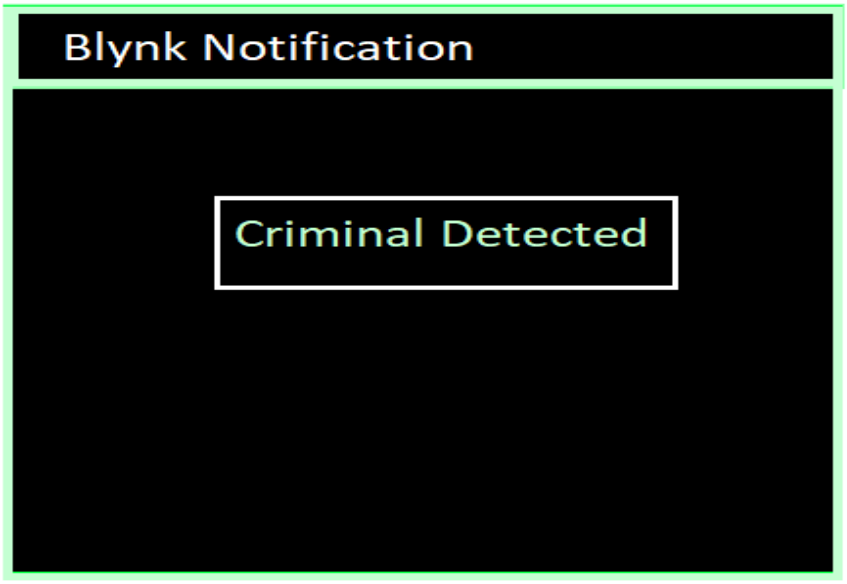

Fig-8: message alert

Blynk app for Raspberry pi:

- Download Blynk app on user mobile.
- Create New Account.
- Create New Project.
- Add Widgets to project(alert message).
- Connecting with Raspberry Pi(code).
- Execution.
- Output(Fig 8).

9. CONCLUSION

Prototype for Security system using face detection is successfully implemented and tested. Since it can be implemented on raspberry- pi it can be used for security systems in real time. The test results shown in the paper show that criminal can be accurately detected and the user will receive an alert. This paper shows that by using openCV and Raspberry pi in real time, implementation is possible for small scale industries. Future Work: even more efficient algorithm can be made and implemented for large scale breach detection.

REFERENCES

[1] R. Chellappa, et al. Human And Machine Recognition Of Faces: A survey. Proceedings of the IEEE, 83 (1995), pp. 705-741.

[2] R. Padilla, C. F. F. Costa Filho And M. G. F. Costa "Evaluation Of Haar Cascade Classifiers Designed For Face Detection" International Journal Of Computer, Electrical, Automation, Control And Information Engineering Vol:6, No:4, 2012.

[3] Snehal Humne1, Prachi Sorte2 " A Review On Face Recognition Using Local Binary Pattern Algorithm" International Research Journal Of Engineering And Technology (IRJET) Volume: 05 Issue: 06 (2018).

[4]Https://Www.Learn.Sparkfun.Com/Notification/Blynk

[5]Https://Www.Jouraldev.Com/Python-Numpy-Tutorial

[6] Shervin Emami, Valentin Petruț Suciu " Face Recognition Using Open Cv" Journal Of Mobile, Embedded And Distributed Systems, Vol. Iv, No. 1, 2012.

[7]Https://Www.Blog.Pythonlibrary.Org/Pil

[8] Python Using Idle By Herb Norbom. Publisher: Createspace Independent Publishing Platform; First Edition Edition (2013).

[9] Monirul Islam Pavel, Israth Chowdhury, Afrin Akther "Raspberry Pi For Image Processing" International Journal Of Scientific & Engineering Research(IJSER) Vol. 5(2018).

[10] S.Kalas, Mamata "Real Time Face Detection And Tracking" International Journal of Computing and Artificial Intelligence Volume:2 Issue :1(2014).