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Criminal Face Recognition using Raspberry Pi

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***Abstract* - This paper presents a real time face recognition using an automated surveillance camera. The proposed system consists of 4 steps, including (1) training of real time images (2) face detection using Haar-classifier (3) comparison of trained real time images with images from the surveillance camera (4) result based on the comparison. An important application of interest is automated surveillance, where the objective is to recognize people who are on a watch list. The aspiration of this paper is to compare an image with several images which has been already trained. In this paper, this system represents a methodology for face detection robustly in real time environment. Haar cascading is one of the algorithms for face detection. Here system uses Haar like classifiers to track faces on OpenCV platform. The accuracy of the face recognition is very high. The system can successfully recognize more than one face which is useful for quickly searching suspected persons as the computation time is very low. In India, we have a system for recognizing citizen called Aadhaar. If system uses this as a citizenship database, it can differentiate between citizen and foreigner and further investigate whether the identified person is criminal or not.**

Keywords: Raspberry Pi, Surveillance Camera, Face Recognition, Image Masking, Open CV.

I. INTRODUCTION

Face recognition which is a combination of machine learning and the biometric techniques which holds the qualities of not only high precision but also the reliability. For automatically detecting the human's face from the databases this system can be used. In recent years open computer vision has been widely used in different kinds of applications such as surveillance camera, robotics etc. This technology is used for authentication, validation, authorization, and identification. In developed countries, the government creates a datasets which is helpful for recognize the human face which compares the suspicious act with trained dataset and information stored in database.

Face identification [1] is defined in three steps (1) face detection (2) feature extraction (3) face recognition. Camera configuration is very important to track moving persons and recognize [2] them precisely. Facial feature points encode critical information about face shape. Precise location and facial feature points tracing are important. Each feature point is usually detected and traced by performing a local search for the better matching position [3]. There are very less researches on face recognition using edge-based detection [4]. The edges are not only carrying valuable data about face but are also simple to process. The Viola Jones method builds a classifier by selecting a few significant features using AdaBoost. Viola jones method successfully merges more composite classifiers in cascade structure [5] which exponentially increases speed of detector by focusing on the favourable features of the face.

II. METHODOLOGY

This paper is going to develop face detection and recognition system that is capable of processing images very fast while acquiring very high true positive face detection rates. Object recognition frameworks have been tried crosswise over different standard face databases, with and without noise and other obscuring effects. The outcome of Object recognition frameworks uncover that well utilized face recognition even from low quality pictures and shows astounding execution productivity, monitor threats, and avoid/examine criminal activities addition to face detection motion detection is always an important requirement.

Criminal Identification Using Raspberry Pi is mainly about maintaining a secure environment. OpenCV (open source computer vision) is the major software that is being used in this project. For detecting faces, system using various algorithms like Haar cascade, linear SVM, deep neural network, etc. The main method that is proposed in this work is, if any person comes in front of the pi camera, first it will look for potential matches that we have already stored in this system. If the module finds a match then it captures the person and sends an alert to the Headquarter.

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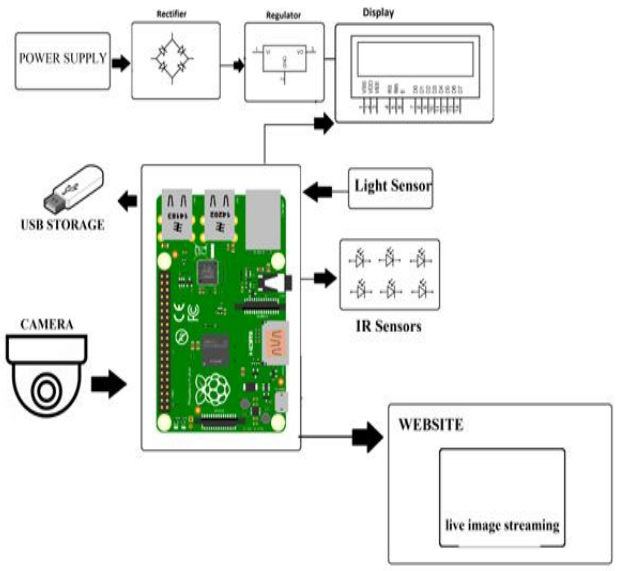

Figure 1: System Architecture

In this paper, system will use three databases. The images in all the three databases are pre-processed to remove noise and redundancy. Then it undergoes feature extraction where Haar cascade is used. First database will have the images and details of all the citizens of the given country. Second will have the images and details of criminals/suspects who belong to that country. Third database will contain the images and details of the criminals and suspects who are not the citizens of the country. The video obtained from the surveillance camera will be converted into frames. When a face is detected in a frame, it is pre-processed where noise and redundancies are reduced. Then it undergoes feature extraction where Haar cascade comes into picture.

The processed real time image is compared with the processed images already stored in the citizen database. If match is found, it is further compared with the images stored in local watch list database to identify if the person is criminal/suspect. If he is criminal/suspect the time for which he was under the surveillance of the camera is noted. If he is not a citizen, it is further compared with the images stored in international watch list database. If match found, the time for which he was under the surveillance of the camera is noted. If match is not found in both the watch lists, he is considered as an innocent.

III. DATASET

In this paper, system will use three databases. The images in all the three databases are pre-processed to remove noise and redundancy. Then it undergoes feature extraction where Haar cascade is used. First database will have the images and details of all the citizens of the given country. Second will have the images and details of criminals/suspects who belong to that country. Third database will contain the images and details of the criminals and suspects who are not the citizens of the country.

IV. RESULTS AND DISCUSSIONS

This section pays special attention to the main consequences of face recognition for criminal identification. This deals with outline development and testing the Face recognition. Here, software's out there that resemble the same services as the face recognition system, however, this also has its own merits that can contribute to the society.

Due to its intricacy and revelation building, the recognition of the automated face identification tool might be burdensome. Moreover, there is also possibility for giving the interface as user – friendly which wants the minimal amount of interaction among the users. With this system, which automatically processes the image, users need only requires to offer input a real time image & the system will do the rest. Furthermore, new functions can be added by experienced developer because this is an open source system. This is a simple model which always makes the system easier for utilize. As completely, there are some of the advantages which have to be recognized as below:

It is a healthier substitute which used for identifying the thumb print. Criminal photo captured through a video source is fed the identification of the system. This system has the capacity for automatically doing the process like recognize, detect and extract the features of the images and identifies the actions.

V. CONCLUSION

This paper has introduced the face recognition system based on Haar cascade. Even though the stored set of images of the person in the database differ from the input image, the system serves as a fruitful method of identifying the faces. In order to find the difference between input image and stored images the system takes out and calculates main features from the input image.

Thus, some changes in the new face image to be recognized can be allowed. Recognition precision and better discriminatory power, computational cost because smaller images with only main features require least processing to train the Haar wavelets. The main advantage is that system uses citizenship database which already exists.

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REFERENCES

[1] International Conference on Intelligent Computing and Control, Volume 1, Karpagam College of Engineering, Coimbatore India. June-2017. (Published on IEEE Xplore Digital library).

[2] Published in Inderscience (International publishers of academic, scientific and professional indexed by Scopus(Elsevier), ACM Digital Library, Asian Digital Library, Academic OneFile(Gale)). Volume 8 No. 4 pp. 403-417 http://dx.doi.org/10.1504/IJCVR.2018.093968

[3] Jyoti Nautiyal, Shivali Gahlot and Pawan Kumar Mishra, "An automated technique for criminal face identification using biometric approach",Conference on Advances in Communication and Control Systems 2013(CAC2S 2013)

[4] Unsang Park, Hyun-Cheol Choi, Anil. K Jain and Seong-Whan Lee, "Face tracking and recognition at a distance: A coaxial and concentric PTZ camera system", IEEE transactions on information forensics and security, vol.8, no.10, October 2013.

[5] Yongqiang Li, ShangFei Wang, Yongping Zhao and Qiang Ji, "Simultaneous facial feature tracking and facial expression recognition", IEEE Transactions on image processing, vol.22, no.7, July 2013.

[6] Reza Moradi Rad, Abdolrahaman Attar, Reza Ebrahimi atani, "A Robust Face Recognition method using edge based features", 2012 IEEE Symposium on Computers and Informatics.

[7] Paul Viola, Michael Jones, "rapid Object Detection using a Boosted Cascade of Simple Features".

[8] Face Recognition using Local Binary Patterns (LBP) By Md. Abdur Rahim, Md. NajmulHossain, Tanzillah Wahid & Md. ShafiulAzam.

[9] G. Bradski& A. Kaebler (2009), "Learning OpenCV", China: Southeast Univ. Press.

[10] Open Source Computer Vision Library Reference Manual-intel.

[11] Gary Bradski& Adrian KaehlerO"Reilly (2008), "Learning OpenCV", O'REILLY Media.

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