



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 10, October 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Survey towards Criminal Identification through Face Recognition

Shantanu Sangle¹, Sarvesh Shinde², Sairaj Naikwadi³, Roshan Avhad⁴, Prof. Rushikesh S. Bhalerao⁵

U.G. Student, Department of Information Technology, Sir Visvesvaraya Institute of Technology, Nashik, India¹⁻⁴

Associate Professor, Department of Information Technology, Sir Visvesvaraya Institute of Technology, Nashik, India⁵

ABSTRACT: Face acknowledgment is a standout amongst the most difficult subjects in PC vision today. It has applications running from security and observation to amusement sites. Face acknowledgment programming are valuable in banks, airplane terminals, and different organizations for screening clients. Germany and Australia have conveyed confront acknowledgment at outskirts and traditions for Automatic Passport Control. Human face is a dynamic protest having high level of fluctuation in its appearance which makes confront acknowledgment a troublesome issue in PC vision. In this field, precision and speed of ID is a principle issue. Numerous difficulties exist for confront acknowledgment. The power of the framework can be blocked by people who change their facial highlights through wearing hued contact focal points, growing a mustache, putting on serious make-up, and so on. Moral concerns are additionally identified with the way toward recording, contemplating, and perceiving faces. Numerous people don't endorse of observation frameworks which take various photos of individuals who have not approved this activity. The objective of this paper is to assess confront discovery and acknowledgment procedures and give a total answer for picture based face location and acknowledgment with higher exactness, better reaction rate and an underlying advance for video observation. Arrangement is proposed in light of performed tests on different face rich databases as far as subjects, stance, feelings and light. algorithm.

KEYWORDS: criminal detection, face recognition neural networks, security, image processing.

I. INTRODUCTION

Image Face recognition is the task of identifying an already detected object as a known or unknown face. Often the problem of face recognition is confused with the problem of face detection. On the other hand is to decide if the "face" is someone known, or unknown, using for this purpose a database of faces in order to validate this input face. This project main objective is to create an efficient architecture for face recognition in playing videos using Neural Network. This product which two self contained Neural Network (CNNs) which are used to detect and recognize faces in regions containing a dense grouping of features from Accelerated Segment Test (FAST).

In the modern world, security is one of the main concerns. There is significant rise of threats to the society with increasing rate of crimes and terrorist activities. Even have many ways of identifying a person, Finger print recognition, voice recognition, Iris and voice recognition are the approaches of biometric identification. It also useful in footages taken by surveillance and application. This project is aimed to identify the criminal faces. Criminal Detection through Face Recognition is a challenging problem in the field of image processing. Images, acquired from different sources may be sensitive to noises and lighting conditions. Detection of face from noised and low resolution is difficult task. To solve these problems, there is need to perform some preprocessing techniques. Preprocessed images are helpful to get better accuracy and to improve face recognition performance of the system. The main objective of our project is to show matched faces in input images and in playing video so this type of application can be useful in security. By this project we are going to match any other contents of images into videos. Propose system are going to matches faces into uploaded images.

Paper is organized as follows. Section I describes the introduction to subject with motivation and objectives. Section II describes related work done in the field of face recognition. Section III describes the proposed system with system flow diagram and algorithm which will be used for recognition. While the paper concludes with conclusion.

II. RELATED WORK

In this section we have written literature survey wherein we have collected papers from various IEEE conferences and journals which are mentioned as below:

1. Mayuri S. Takore, Pallavi R. Wankhade, "Criminal Face Identification System" February 2015 Criminal record usually contains personal information concerning explicit person Alongside photograph. To spot any Criminal we need some identification related to person, that are given by viewer. In most cases the standard and backbone of the recorded image segments is poor and hard to identify a face. To beat this drawback, we tend to be developing code. Identification can be done in various ways like finger print, eyes, DNA etc. One in all applications is face identification. The face is our primary focus of attention in social interactions taking part in significant role in conveying identity and establishing emotion. Though the power to infer intelligence or character from facial look is suspect, the human ability to acknowledge face is outstanding.
2. Nurul Azma Abdullah, Md. Jamri Saidi, Nurul Hidayah Ab Rahman, Chuah Chai Wen, and Isredza Rahmi A. Hamid, "Face recognition for criminal identification- Associate Degree implementation of principal component analysis for face recognition", The second International Conference on Applied Science and Technology 2017 In this paper, an automatic face recognition system for criminal info was proposed using known Principal Component Analysis approach. This technique are going to be ready to discover face and recognize face automatically. This can facilitate the law enforcements to detect or recognize suspect of the case if no thumbprint present on the scene. The results show that about 80% accuracy
3. E-CRIME DETECTION Using FACE RECOGNITION SYSTEM 8616 Volume three, Issue 2 April 2014. Proposed system is goes to spot criminals at numerous security place like airdrome, railway etc. Video Camera captures a hard and fast range of frames of a person coming in front of sign on counter. Proposed system compares these captured pictures taken through the camera with the pictures of the Criminals which are stored in the database. Proposed system is connection of two stages Face detection using Haar Based Cascade classifier and recognition using Principle Component analysis with Eigen Face. The goal is to implement the system (model) for a selected face and distinguish it from an oversized range of stored faces with some period of time variations as well.
4. Prarthana Sandip Patil, Pournima Paman Patel, Snehal Prakash Sonar, Chaudhari Vrushali Kishor, "Crime Identification using 3-D Face Recognition", International Journal of Emerging Technologies in Engineering Research, 2018. The objective of this paper is to assess confront discovery and acknowledgment procedures and provides a complete image based mostly face location and acknowledgment with higher truth, higher reaction rate associated an underlying advance for video observation. Arrangement is planned in light of performed tests on totally different face made databases as so much as subjects, stance, feelings and light.
5. Ashutosh Chandra Bhensle, Rohit Raja, "An Efficient Face Recognition using PCA and Euclidean Distance Classification", IJCSMC, 2014. Person identification using face is incredibly exigent and knotty drawback. Recognition of a person from an arbitrary perspective is crucial necessities for security measures and access management. Recognition of a specific face may be useful for countless issues like person laptop interaction, criminal detection, etc. The present system has additional calculation because of higher dimensional and no more effectual still. Rather than feat of face vectors with high speciality it is higher to use face vectors with lower speciality. This enforced face recognition system is easy and comparatively simple to recognize the faces from videos taken from a distance and web cams. The improved PCA rule removes facial expressions and classification is performed by minimum distance classification algorithm.
6. Multi-scale feature extraction for single face recognition. The Single sample face recognition has always been a hot but difficult issue in face recognition. By considering selecting robust features and generating virtual samples simultaneously, the paper proposes a multi-scale support vector transformation (MSSVT) based method to generate multi-scale virtual samples for single image recognition. The methods to solve problem are divided into

two categories. One is to look for and select features that are robust to the number of samples, from the point of view of feature selection, such as PCA and 2DPCA. But when each person has only one face to be trained, the feature information extracted from the feature extraction algorithm will also be very limited, resulting in a bad recognition performance. The other is to generate multiple virtual samples from the point of view of the extended sample, thus reducing the impact of the sample size.

7. .Face recognition method based on sparse representation and feature fusion. The authors propose a multi-feature fusion face recognition method based on sparse representation. The core idea is to find the sparseness through training, and then use the sparse coefficient and training samples to represent the test samples, and then the optimal sparse solution is obtained by solving the l_1 -norm problem. The recognition results of feature fusion method are better than any single feature algorithm under the condition of non-occlusion or occlusion. When there are less than 10 pictures of each category of people in the training sample and the occlusion type is not controllable, our algorithm can still obtain a high recognition rate.
8. Spatial pyramid pooling in deep convolutional networks for visual recognition .For Visual Recognition, Scales, Sizes and Aspect Ratio are considered as important factor. SPP (Spatial Pyramid Pooling) is a flexible solution for handling these factors. In context of deep networks, these factors have received less consideration ,thus the system is trained with deep layer networks considering SPP layer. SPP-net shows outstanding accuracy in classification/detection tasks and greatly accelerates DNN-based detection. Their studies also show that many time-proven techniques/insights in computer vision can still play important roles in deep-networks-based recognition.
9. Face and Gender Recognition System Based on Convolutional Neural networks.The proposed Face and Gender Recognition System realizes the combination of image face recognition and gender recognition module, which enables not only face recognition but also gender recognition in complex background. Based on the ResNet50 neural networks, we use the global average pool (GAP) instead of the fully connected layer before final output, followed by the softmax layer, which reduced the size of the networks. By constructing such a simple structure, the accuracy of the system recognition has been improved.
10. Dynamic Feature Matching on Partial Face Recognition. In The partial face recognition is having application in a broad spectrum of different fields. The different approaches used for the partial face recognition are the key point-based approach, region-based approach, and CNN-based approach. In key point-based, the popular method was MKD-SRC. In region-based partial face recognition approach, the prominent model is MR-CNN. In the midst of different approaches in partial face recognition, it is concluded that the CNN-based approaches are the comparatively best approach. The current novel approach proposed for partial face recognition. in CNN– based is called Dynamic Feature Matching (DFM). The dynamic feature dictionary correlating to the probe is achieved. DFM is able to yield the advantages of the properties of FCN and generate identifying features more precisely. DFM is having a promising application in various video recognition approaches in the future.
11. Implementation of Principal Component Analysis on Masked and Non-masked Face Recognition.The paper analyses non-masked face recognition and masked face recognition accuracy using Principal Component Analysis (PCA) to recognize a person. It proved that, a face without mask gives better recognition rate in PCA based face recognition system. But when a person is wearing mask, facial recognition gives poor recognition rate. It is found that extracting feature from a masked face is less than non-masked face. Because of missing features for wearing mask which decrease the recognition rate. Finally, it is concluded that traditional statistical algorithm Principal Component Analysis (PCA) is better for normal face recognition but not for masked face recognition. So, in the future, concern to improve the accuracy of masked face recognition using other sophisticated machine learning methods.

III. METHODOLOGY

In this project, System propose a Criminal Detection through Face Recognition. Over come the drawbacks that were in the existing system we develop a system that will be very useful for any investigation department. Here the program keeps track of images from different sides of faces. Based on this record number the program retrieves the personal record of the suspect (which face from comparing and get result more than 90% match then show that person location and information also) on exercising the 'locate' option.

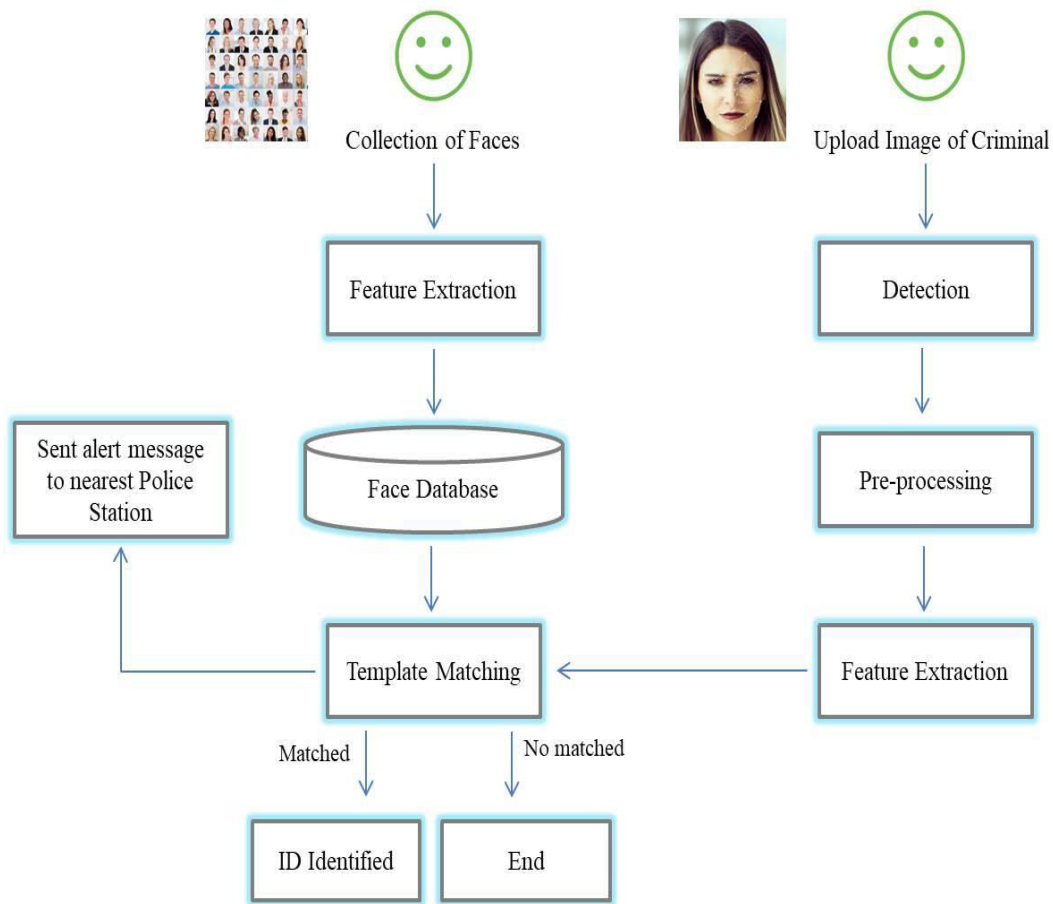


Fig1: System Architecture

The system architecture(Fig 1) compares the image of criminal with dataset available for criminals. The process consists of feature extraction, matching the template with available images. Then the criminal is identified. The data flow diagram of level 0(Fig 2) gives the view of application to be created for execution of task.

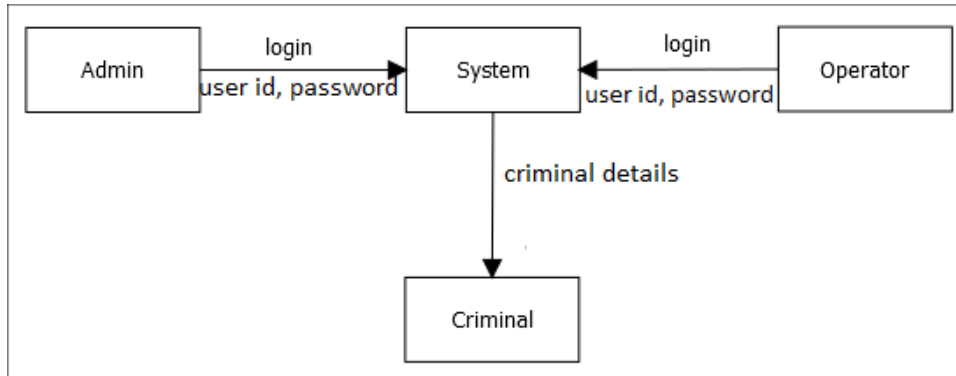


Fig2 : Data flow Diagram Level 0

IV. ALGORITHM - CNN

Convolutions Neural Network (CNN) is comprised of one or more convolutions layers (often with a sub sampling step) and then followed by one or more fully connected layers as in a standard multi layer neural network. The architecture of a CNN is designed to take advantage of the 2D structure of an input image (or other 2D input such as a speech signal). This is achieved with local connections and tied weights followed by some form of pooling which results in translation in variant features. Another benefit of CNN's is that they are easier to train and have many fewer parameters than fully connected networks with the same number of hidden units

- Step 1: Dataset containing images along with reference caption is fed into the system
- Step 2: The convolutional neural network is used a encoder which extracts image features 'f' pixel by pixel.
- Step 3: Matrix factorization is performed on the extracted pixels. The matrix is of m x n.
- Step 4: Max pooling is performed on this matrix where maximum value is selected and again fixed into matrix.
- Step 5: Normalization is performed where the every negative value is con-verted to zero.
- Step 6: To convert values to zero rectified linear units are used where each value is filtered and negative value is set to zero.
- Step 7: The hidden layers take the input values from the visible layers and assign the weights after calculating maximum probability.

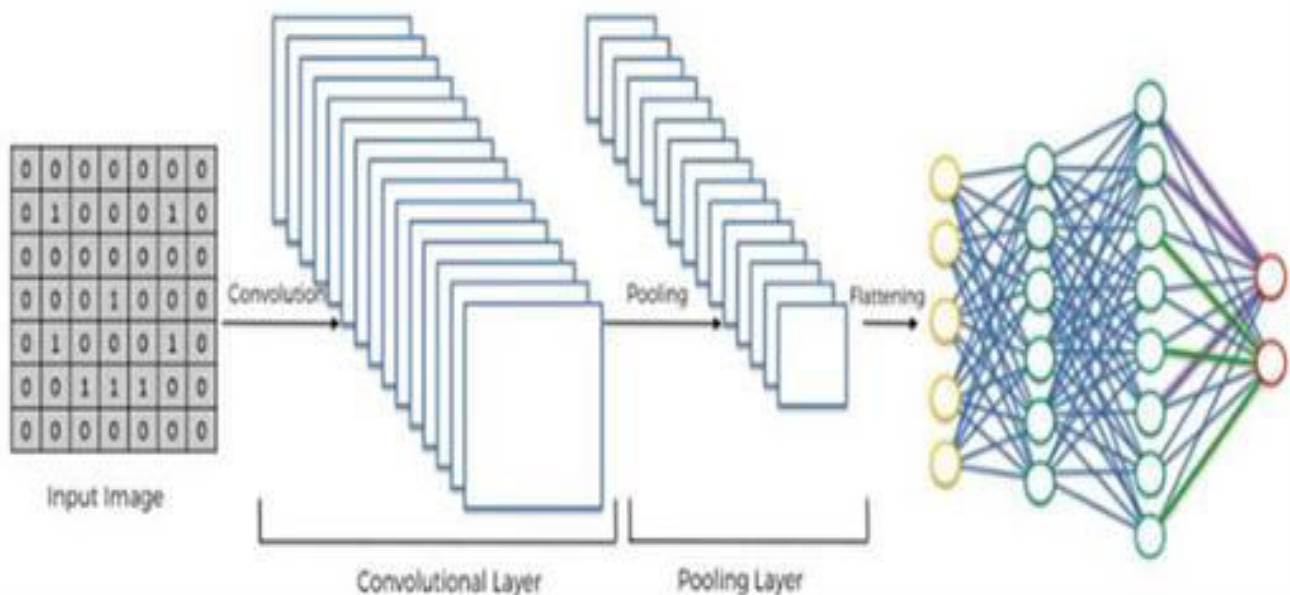


Fig3: CNN Architecture

V. CONCLUSION

We have proposed Face recognition using Neural Network. The system aims to find solutions for a robust method for face recognition from videos, reducing the time requirements for face recognition with introduction of frames. This system provides better approach to detect criminal. We have demonstrated various concerns related to the face recognition process, such as the lighting and background condition in which the facial images are taken. In future we introduce a new face recognition technique to accomplish a system to handle video-based images under variety of pose and illumination conditions. And, we make use of PCA, FLDA technique to obtain virtual frontal face for Dimensionality reduction and Presentation respectively. LLR technique to obtain virtual frontal face and we appoint DCT for illumination normalization. We also intended to introduce a new algorithm which is more efficient than NN, SVM, HMM region. The system can be enhanced with use of hybrid method to increase the accuracy for given dataset.

REFERENCES

- [1] Takore, M.S. and Wankhade, P.R., 2015. Criminal Face Identification System.
- [2] Abdullah, N.A., Saidi, M.J., Rahman, N.H.A., Wen, C.C. and Hamid, I.R.A., 2017, October. Face recognition for criminal identification: An implementation of principal component analysis for face recognition. In AIP conference proceedings (Vol. 1891, No. 1). AIP Publishing.
- [3] E-Crime Detection Using Face Recognition System 8616 Volume three, Issue 2 April 2014.
- [4] Patil, P.S., Patel, P.P., Sonar, S.P. and Kishor, C.V., Crime Identification using 3-D Face Recognition. measurements, 2, pp.1-2.
- [5] ChandraBhensle, A. and Raja, R., 2014. An efficient face recognition using PCA and Euclidean distance classification. Int. J. Comput. Sci. Mob. Comput, 3(6), pp.407-413.
- [6] X. Xu, L. Zhang and F. Li, "MSSVT: Multi-scale feature extraction for single face recognition," 2018 24th International Conference on Pattern Recognition (ICPR), Beijing, 2018, pp. 1996-2001, doi: 10.1109/ICPR.2018.8545343.
- [7] C. Jiang, M. Wang, X. Tang and R. Mao, "Face recognition method based on sparse representation and feature fusion," 2019 Chinese Automation Congress (CAC), Hangzhou, China, 2019, pp. 396-400, doi: 10.1109/CAC48633.2019.8997456.
- [8] He, K., Zhang, X., Ren, S. and Sun, J., 2015. Spatial pyramid pooling in deep convolutional networks for visual recognition. IEEE transactions on pattern analysis and machine intelligence, 37(9), pp.1904-1916.
- [9] Y. Zhou, H. Ni, F. Ren and X. Kang, "Face and Gender Recognition System Based on Convolutional Neural networks," 2019 IEEE International Conference on Mechatronics and Automation (ICMA), Tianjin, China, 2019, pp. 1091-1095, doi: 10.1109/ICMA.2019.8816192.
- [10] M. R. Reshma and B. Kannan, "Approaches on Partial Face Recognition: A Literature Review," 2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI), Tirunelveli, India, 2019, pp. 538-544, doi: 10.1109/ICOEI.2019.8862783.
- [11] M. S. Ejaz, M. R. Islam, M. Sifatullah and A. Sarker, "Implementation of Principal Component Analysis on Masked and Non-masked Face Recognition," 2019 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT), Dhaka, Bangladesh, 2019, pp. 1-5, doi: 10.1109/ICASERT.2019.8934543."



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.423



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

9940 572 462 **6381 907 438** **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details