



ISSN: 2454-9940



**INTERNATIONAL JOURNAL OF APPLIED
SCIENCE ENGINEERING AND MANAGEMENT**

E-Mail :
editor.ijasem@gmail.com
editor@ijasem.org

www.ijasem.org

<https://doi.org/10.5281/zenodo.14066153>

INTELLIGENT CRIME DETECTION USING FACIAL RECOGNITION TECHNOLOGY

¹L.Priyanka, ²Byri.Soujanya
¹Assistant Professor, ²MCA Student

Department Of MCA

Sree Chaitanya College of Engineering, Karimnagar

ABSTRACT

Since protecting people and property is the police's top priority, crime prevention and criminal identification are the main priorities of police officers. However, there is a shortage of police officers to combat crime. This project's objective is to recognise the faces of people who have been convicted in the past and offer a solution that is more accurate, has a higher response rate, and serves as a first step for video surveillance. The nature of the criminal psychology of committing or participating in a recurring crime informs the suggested solution. History sheeters are tracked and identified using this method both before and after any mischief or illegal action. To facilitate data retrieval and ensure prompt implementation of findings in the real world, we are keeping the criminal's photograph and other details in a database within the system. The project is based on Python 3.5 and uses Open CV to record the details of the people we have utilised, along with techniques like LBPH, facial recognition, and Haar cascade classifier. CSV.

I. INTRODUCTION

A criminal record includes biographical information, a picture, and data about a specific individual. We require the person's identification in order to identify any history sheeters. Face identification is one method. In social interactions, the face is the main object of our attention and is crucial for expressing identity and

feelings. It is amazing how well humans can recall and identify faces. The goal of this system is to efficiently follow repeat offenders by providing a copy of their identifying characteristics and personal information in real time. In a distributed context, a criminal face identification system builds a database of criminals and can identify a person if their image matches one that already exists. The initiative will mark a significant advancement in surveillance and video-based facial recognition.

Problem Identification

There is no consult thing regarding criminal face detection in india , although india is a developing country and are working / using these face detection projects by which they are able to find the criminals easily by matching the face in their criminal database by removing the complexity or by matching the victim's face organs like eyes, ears, nose, by which they can easily recognize the face of the criminals in any difficult condition, so this project help the police of our country and help them by matching the imaginary data / sketch or the image with the complexity of photo matching .so we remove the complexity from the image and then matches with the criminal database ,if the data has been matches with the current existing record it will be very beneficial for the department.

Motivation and Scope of the project

<https://doi.org/10.5281/zenodo.14066153>

There is no dedicated Criminal Face Detection System to assist in facial detection of criminals rather police technicians have to go through to different pictures of criminals and manually slice each picture to generate images, this will usually lead to the generation of low resolution and blurred images. This system is aimed to identify the criminals in any investigation department. Scope of the system is completely identification of the face. Within the allocated time completing the system with the specified user requirements. One system is for the administrator and the other one is for the users. It can be used in many fields there are Bank, Hotel and Police Station. A throughout survey has revealed that various methods and combination of these methods can be applied in development of a new face recognition system. Among the many possible approaches, we have decided to use a combination of knowledge based methods for face detection part and neural network approach for face recognition part. The main reason in this selection is their smooth applicability and reliability issues. The accuracy of text and face recognition is based upon pose, illumination, emotions, facial components and image quality. Certain features need to be incorporated in the system to process real time images at faster rate with high precision. Another aspect of the research includes, developing a model which if trained on given criminal record dataset can predict the face sketch of a criminal based upon features fed as input by a witness.

Purpose of This Project

- To improve the current existing criminal face detection system.
- To provide a fast detection of a criminal in a mean time.
- To remove the complexity from the image.
- Easy detection of criminal by using a getting an image through the CCTV camera or difficulty in detection of a criminal or to match the data with the criminal record.

Objective of the project

This project is intended to identify a person using the images previously taken. The identification will be done according the previous images of different persons.

Project Scope of the project

The scope of the project is confined to store the image and store in the database. When a person has to be identified the images stored in the database are compared with the existing details.

II. LITERATURE SURVEY

LBPH Based Improved Face Recognition at Low Resolution Aftab Ahmed, Jiandong Guo, Fayaz Ali, Farha Deeba and Awais Ahmed 2018 International Conference of Artificial Intelligence and Big Data, China Automatic individual face recognition is the most challenging query from the past decade in computer vision. However, the law enforcement agencies are inadequate to identify and recognize any person through the video monitoring cameras further efficiently; the blur conditions, illumination, resolution, and lighting are still the major problems in face recognition. Our proposed system operates better at the minimum low resolution of 35px to identify the human face in various angles, side poses and tracking the face during human motion. We have designed

<https://doi.org/10.5281/zenodo.14066153>

the dataset (LR500) for training and classification. This paper employs the Local Binary Patterns Histogram (LBPH) algorithm architecture to address the human face recognition in real time at the low level of resolution.

Criminal Identification System Using Face Detection and Recognition Piyush Kakkar and Vibhor Sharma International Journal of Advance Research in Computer and Communication Technology Vol 7 issue 3 march 2018

As the world has seen exponential advancement over the last decade, there is an abnormal increase in the crime rate and also the number of criminals are increasing at an alarming rate, this leads toward a great concern about the security issues. Various causes of theft, stealing crimes, burglary, kidnapping, human trafficking etc. are left unsolved because the availability of police personnel is limited, many times there is no identification of the person who was involved in criminal activities. To avoid this situation an automated facial recognition system for criminal identification is proposed using Haar feature-based cascade classifier. This paper presents a real-time face recognition using an automated surveillance camera. This system will be able to detect and recognize face automatically in real-time.

Criminal Face Recognition System. Alireza Chevelwalla, Ajay Gurav, Sachin Desai and Prof. Sumitra Sadhukhan International Journal of Engineering Research & Technology

The increasing crime rate and the need for efficient criminal identification and prevention have led to the adoption of security technologies such as CCTV

cameras. In this study, we propose an automated facial recognition system using the Local Binary Patterns Histogram (LBPH) classifier and Fisherface algorithm. The system utilizes a Haar feature-based cascade classifier to detect faces in real-time, and the identified faces are then matched against a criminal database. Although accurate face identification remains a challenge, the Viola-Jones framework is utilized to pinpoint face positions and other features in a picture. Face detection classifiers are publicly available through organizations like OpenCV. Our proposed system has the potential to enhance criminal identification and prevention in public and private space.

III. SYSTEM ANALYSIS & SYSTEM DESIGN

Existing System

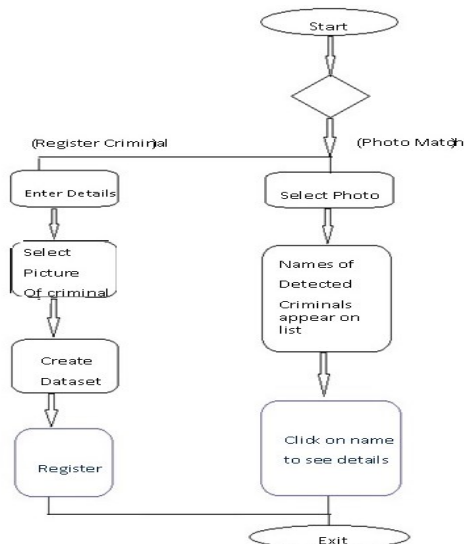
There is no dedicated Criminal Face Detection System to assist in facial detection of criminals rather police technicians have to go through to different pictures of criminals and manually slice each picture to generate images, this will usually lead to the generation of low resolution and blurred images. Linking of each sliced image to the original image is also a herculean task. The Criminal Face Detection System is ineffective because a witness will not be able to continually peruse the different images rather they will receive a broken stream of images and randomness of the sliced image is not achievable. In the current System the complexity in the photo can't be removed and as we are not able to remove the complexity of any image, we can't clarify the criminal or any person with conviction.

Proposed System

<https://doi.org/10.5281/zenodo.14066153>

The proposed method implements an efficient Face Detection and Recognition technique which is independent of variations in features like color, hairstyle, and different facial expressions etc using Viola Jones algorithm.

SYSTEM ARCHITECTURE:



IV. SYSTEM IMPLEMENTATION

Modules

Pre Processing:

A standard image database which is readily available either in color or gray scale is considered. In the Pre-processing stage contrast stretching is performed on the acquired image where the white pixels are made whiter and black pixels are made blacker.

Create the Face Recognizer Object (training)

The next step involves creating the face recognizer object. The face recognizer object has functions like Face Recognizer. train () to train the recognizer and Face Recognizer. predict () to recognize a face. Open CV currently provides Eigenface Recognizer, Fisher face Recognizer and Local Binary Patterns. Histograms (LBPH) Face Recognizer. We have used LBPH recognizer because Real life isn't

perfect. We simply can't guarantee perfect light settings in your images or 10 different images of a person. LBPH focus on extracting local features from images. The idea is to not look at the whole image as a high-dimensional vector but describe only local features of an object. The basic idea of Local Binary Patterns is to summarize the local structure in an image by comparing each pixel with its neighbourhood. LBP operator is robust against monotonic gray scale transformations.

Face Detection (Testing):

For testing the Face Recognizer, we check if the recognition was correct by seeing the predicted label when we bring the trained face in front of camera. The label is extracted using the os module and the string operations from the name of the sample images folder. Lower is the confidence score better is the prediction.

V. SCREEN SHOTS

A. Homepage

Homepage is the main page of Criminal Identification System application. It contains three buttons for: Register Criminal, Photo match and Video Surveillance.



B. Criminal Registration

Criminal Registration page will take atleast 20 images of the criminal while creating dataset of criminal that needs to be registered and also provides input form for providing various details of the

<https://doi.org/10.5281/zenodo.14066153>

criminal like his Name, DOB, Identification mark, Profile picture etc. After selecting images and filling details, user will click register. The criminal will be successfully registered if any error doesn't occur.

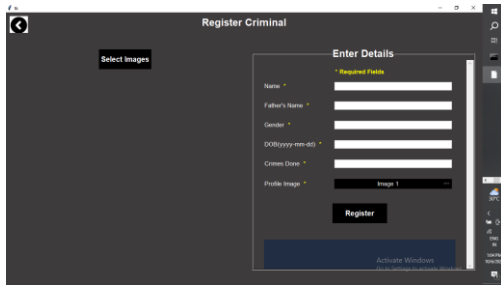


Fig 4.1 Registration page

C. Detect Criminal Page

This page allows the user to browse an image from the system and helps in detecting one or more criminals in it. User can also see the profile of the criminal by clicking on detected criminal names.



Fig 4.3 Details of Criminal

D. Criminal Profile Page

This page will show criminal profile after clicking criminal name from detect criminal or video surveillance page.

VI. CONCLUSION

With the help of this technology, we can identify and detect criminal faces in real time in both images and video streams captured by a camera. In the OpenCV method for face detection, we have employed cascade classifiers based on Haar features. A cascade function is developed using a large number of both positive and negative pictures in this machine learning-based method. Additionally, for face

identification, we have employed Local Binary Patterns Histograms (LBPH). The initiative will mark a significant advancement in surveillance systems and video-based facial recognition.

The following are some benefits of this algorithm: Effective feature selection, By scaling the features rather than the picture itself, we create a size and position invariant detector that can be trained to identify different kinds of objects, such as automobiles, sign boards, number plates, etc.

The LBPH recogniser is highly accurate in identifying faces in a variety of lighting situations. Additionally, LBPH is capable of efficient recognition even when each participant is given a single training image. The following are some drawbacks of our application: Only frontal photographs of faces are the most effective for the detector; it barely handles 45° face rotation around the vertical and horizontal axes.

Future Works:

1. The threshold value could rise as a result of light normalisation.
2. Future research may focus on enhancing face identification by employing certain facial features (distance between eyes) and analysing faces in three dimensions utilising several cameras. These two techniques will reduce the likelihood of mistake and increase the accuracy of the system.

REFERENCES

1. LBPH Based Improved Face Recognition at Low Resolution Aftab Ahmed, Jiandong Guo, Fayaz Ali, Farha Deeba and Awais Ahmed 2018 International Conference of Artificial Intelligence and Big Data, China

<https://doi.org/10.5281/zenodo.14066153>

2. Criminal Identification System Using Face Detection and Recognition Piyush Kakkar and Vibhor Sharma International Journal of Advance Research in Computer and Communication Technology Vol 7 issue 3 march 2018
3. Criminal Face Recognition System. Alireza Chevelwalla, Ajay Gurav, Sachin Desai and Prof. Sumitra Sadhukhan International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Vol. 4 Issue 03, March-2015
4. Jigar M. Pandya, Devang Rathod, Jigna J. Jadav,” A Survey of Face Recognition approach”, International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com Vol. 3, Issue 1, January -February 2013, pp.632- 635, (IEEE) Research papers.
5. Jyoti S. Bedre ,Shubhangi Sapkal, ”Comparative Study of Face Recognition Techniques: A Review”, Emerging Trends in Computer Science and Information Technology – 2012(ETCSIT2012) Proceedings published in International Journal of Computer Applications® (IJCA) .
6. S. Tolba, A.H. El-Baz, and A.A. El-Harby, ” Face Recognition: A Literature Review”, International Journal of Signal Processing 2:2 2006.
7. Sushma Jaiswal, Dr. (Smt.) Sarita Singh Bhadauria, Dr. Rakesh Singh Jadon,” COMPARISON BETWEEN FACE RECOGNITION ALGORITHM-EIGENFACES, FISHERFACES AND ELASTIC BUNCH GRAPH MATCHING”, Volume 2, No. 7, July 2011 Journal of Global Research in Computer Science [5]
8. Ming-Hsuan Yang, David J. Kriegman and Narendra Ahuja, “Detecting Faces in Images: A Survey,” IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE, VOL. 24, NO. 1, JANUARY 2002 [6].