SURVEY ON A CRIMINAL IDENTIFICATION SYSTEM USING FACE DETECTION AND RECOGNITION

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***Abstract*: Face recognition and detection are unimaginable inventions in today's world when it comes to experiencing every crime. Protection, surveillance, entertainment sites, and criminal identification are just a few of the amazing applications. This device is particularly useful for customer screening in banks, airports, and other businesses. CNN needs more data for deep learning because it is still a facial recognition system, which is particularly problematic in the case of applications such as criminal investigations (murder, robbery, etc.). As a result, this project incorporates a face- recognition system that makes it easier and more reliable to scan for offenders, thus assisting police officers effectively and organization. In this paper, we implement the Deep Metric Learning to construct the face embedding for recognition process usingdib face recognition library**

***Keywords*: Crime Detection, Neural Network, Deep learning Algorithm-task**

INTRODUCTION

Crimes and criminal activities are increasing day by day and there are no proper criteria to search, detect, identify, and predict these criminals. Despite various surveillance cameras in different areas still, crimes are at a peak. The police investigation department cannot efficiently detect the criminals in time. However, in many countries for the sake of public and private security, the initiation of security technologies has been employed for criminal identification or recognition with the help of footprint identification, fingerprint identification, facial recognition, or based on other suspicious activity detections through surveillance cameras. However, there are limited automated systems that can identify the criminals precisely and get the accurate or precise similarity between the recorded footage images with the criminals that already are available in the police criminal records. To make the police investigation department more effective, this research work presents the design of an automated criminal detection system for the prediction of criminals. The proposed system can predict criminals or possibilities of being criminal based on Lombrosso's Theory of Criminology about born criminals or the persons who look like criminals. A deep learning-based facial recognition approach was used that can detect or predict any person whether he is criminal, or not and that can also give the possibility of being criminal. For training, the ResNet50 model was used, which is based on CNN and SVM Classifiers for feature extracting from the dataset. Two different labeled based datasets were used, having different criminals and noncriminals images in the database. The proposed system could efficiently help the investigating officers in narrowing down the suspects' pool. Crime poses a serious threat to humanity. An action or omission that constitutes an infraction and is sanctioned by the law is referred to as a crime. While some crimes cause the least damage, some might result in a fatality. Crimes don't have a particular place of concern because they can occur anywhere, from small towns to major metropolia. It is crucial to find a speedier solution to this issue in order to protect our society from all threats. To identify suspicious conduct and safeguard the defenseless, the police force must constantly observe people's actions and behavior

LITURATURE SURVEY

1. This project dives into the topic of facial recognition andfacial detection in a digital communications system. Facerecognition is a technology that is widely used today which brings various benefits to society. Facial recognition differsfrom facial detection in the aspect that facial detection onlyfinds and detects the present face/s in an image whereas, in facial recognition, the computer finds the face/s present in a subject and is able to distinguish the face from a sample of different faces. This research focuses on the implementation of both a facial recognition system and a facial detection system in MATLAB. This research would use the different imaging toolboxes available in the program and would be judged on its ability to accurately detect and recognize asample in a given database. Additionally, this system should be able to create and to read a database of different faces.[1]

2. We all know that our Face is a unique and crucial part of the human body structure that identifies a person. Therefore, we can use it to trace the identity of a criminal person. With the advancement in technology, we are placed CCTV at many public places to capture the criminal's crime. Using the previously captured faces and criminal's images that are available in the police station, the criminal face recognition system of can be implemented. In this paper, we propose an automatic criminal identification system for Police Department to enhance and upgrade the criminal distinguishing into a more effective and efficient approach. Using technology, this idea will add plus point in the current system while bringing criminals spotting to a whole new level by automating tasks. Technology working behind it will be face recognition, from the footage captured by the CCTV cameras; our system will detect the face and recognize the criminal who is coming to 8 Computer Engineering Department, PVG'S , Nashik-2022 Sales prediction system using ML that public place. The captured images of the person coming to that public place get compared with the criminal data we have in our database. If any person's face from public place matches, the system will display their image on

the system screen and will give the message with their name that the criminal is found and present in this public place. This system matching more than 80% of the captured images with database images.[2]

3. The rapid economic development in South Korea has resulted in increase of crimes. Timely detection and reduction of crimes are primary focus of police officers. Internet of Things (IoT) and increasingly cheap and wearable sensors can be used to facilitate this task. Generally, the application of IoT technologies to the fields of smart cities, smart logistics and healthcare can be seen more often. In this paper, we present the design of IoT based smart crime detection system. The proposed system is able to detect crimes in real-time by analyzing the human emotions.[3]

4. Considered as object-based image analysis (OBIA). It is an effective technique for high spatial resolution (HSR) imaging. Classification by a clear and intuitive technical process. However, OBIA relies on manual adjustment of the image. Classification function. This is tricky work. Deep learning (DL) The technology automatically learns image features from a large number of images, Achieving higher image classification accuracy than before Technique. The study uses a new method called object scale adaptive convolutional neural networks (OSA-CNN), Combine OBIA and CNN, recommended for HSR images classification. First, OSA-CNN collects image blobs Principal axis of the object primitive taken from the image segmentation; the size of the former is determined automatically By the axial width of the latter. This step generates the input Units required for CNN classification. Second The squeeze and excitation blocks are extracted from the SE network.[4]

AIM & OBJECTIVES

- The main objective of Real-time criminal identification based on face recognition Application is to help police personnel identify criminals.
- The objective of this application is to provide information about a particular criminal which we are finding.
- Police personnel can use this application anytime, anywhere to find a criminal
- Any police personnel can access this application using internet from anywhere and anytime.
- We can also find criminals from live CCTV surveillance cameras.
- This application is fast, robust, reasonably simple and accurate with a relatively simple and easy to understand GUI.

MOTIVATION

To develop an application which will serve a way to register and track criminals remotely with the help of criminal data. This application provides two ways to identify criminals. One is by manually providing the photos of criminal and the other way is by using live CCTV cameras.

SYSTEM ARCHITECTURE

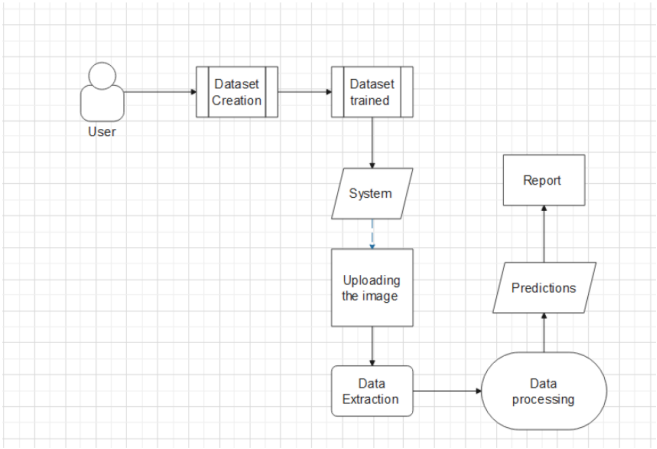

Fig -1: System Architecture Diagram

APPLICATION:

- Personal
- Organization
- Company
- Malls
- Airport
- Temples

FUNCTIONAL & NON-FUNCTIONAL REQUIREMENTS

Functional requirements: may involve calculations, technical details, data manipulation and processing and other specific functionality that define what a system is supposed to accomplish. Behavioral requirements describe all the cases where the system uses the functional requirements; these are captured in use cases.

Nonfunctional Requirements: (NFRs) define system attributes such as security, reliability, performance, maintainability, scalability, and usability. They serve as constraints or restrictions on the design of the system across the different backlogs.

Functional requirements

- Registration
- User Login
- Creation of database: Users Mandatory Information

Design Constraints:

1. Database
2. Operating System
3. Web-Based Non-functional Requirements

Security:

1. User Identification
2. Login ID
3. Modification

Performance Requirement:

1. Response Time
2. Capacity
3. User Interface
4. Maintainability
5. Availability

SYSTEM REQUIREMENTS

Software Used:

- Python 3.9.0 or above, Kaggle and PyCharm

Hardware Used:

- I3 processor or above
- 150 GB Hard Disk or above
- 4 GB RAM or above

CONCLUSION

In this work, we compare the various types of images and the accuracy level of results is very satisfying. It performs well with both images and videos. The results displayed are 90% accurate. This requires less memory space to implement and takes less time when compared with other approaches. By using this the criminals and missing children/person can be easily identifiable and it keeps on updating dynamically. The analysis process carried out with real criminal images in the web and it provides good results. We believe that, this application will decrease the crimes in our environment Hence, we are overcoming the drawback of exiting system and provide better solution in low cost

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