A Mini Project Synopsis on

CRIMINAL FACE RECOGNITION (CRIMINAL EYE)

S.E. – Computer Science and Engineering-Data Science

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CERTIFICATE

This to certify that the Mini Project report on **CRIMINAL FACE RECOGNITION** has been submitted by **Sonal Sonarghare** (21107033) ,**Harsh Shelke** (21107022),**Meghraj Padwal** (21107025) and **Swapnil Rathod (**21107064) who are a Bonafede students of A. P. Shah Institute of Technology, Thane, Mumbai, as a partial fulfilment of the requirement for the degree in **Computer Science and Engineering(Data Science)**, during the academic year **2022-2023** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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CHAPTER 1

Introduction :

There is an abnormal increase in the crime rate and also the number of criminals is increasing, this leads towards a great concern about the security issues. Crime preventions and criminal identification are the primary issues before the police personnel, since property and lives protection are the basic concerns of the police but to combat the crime, the availability of police personnel is limited. With the advent of security technology, cameras especially CCTV have been installed in many public and private areas to provide surveillance activities. The footage of the CCTV can be used to identify suspects on scene. This Real time criminal identification system based on face recognition works with a fully automated facial recognition system

Criminal face recognition, also known as facial recognition technology, is a biometric technology that uses algorithms to match a person's facial features with a database of images to identify individuals. The criminal face recognition system is an initiative to develop a technology that can aid law enforcement agencies in identifying individuals who have been accused or convicted of a crime. The project involves creating a program that can analyze Real-Time footage and images of a suspect's face and compare it to a database of known criminals to identify a match based on specific facial features and characteristics.

Our aim, which we believe we are reaching, was to develop a system that can be used by police or investigation department to recognize criminal from their faces. The method of face recognition used is fast, robust, reasonably simple and accurate with a relatively simple and easy to understand algorithms and technique.

1.1. Purpose:

CRIMINAL EYE primary purpose of a criminal face recognition system is to help law enforcement agencies identify suspects or persons of interest in criminal investigations. By comparing images of an individual's face captured by surveillance cameras, body-worn cameras, or other sources against a database of known faces, the technology can help law enforcement agencies quickly identify individuals who may have committed a crime.

In addition to identifying suspects, criminal face recognition systems can also be used to track the movements of individuals who are already under investigation, to help locate missing persons, or to prevent crime by identifying potential threats before they can act.

Criminal face recognition systems can be particularly useful in cases where other identifying information, such as a name or address, is not available. The technology can also help law enforcement agencies solve cold cases by identifying suspects from old surveillance footage or other sources of images.

1.2. Objectives:

The primary objective is to accurately identify suspects in Real-Time thus reducing the risk of false positives and minimizing the chances of innocent individuals being wrongly accused. By identifying criminals and preventing future crimes, criminal face recognition can enhance public safety and security in communities. Automate and streamline the process of identifying suspects, saving time and resources. By automating the identification process, criminal face recognition can reduce the potential for human error or bias in suspect identification. The system is cost-effective, with minimal hardware and software requirements, and affordable for law enforcement agencies. This application is fast, robust, reasonably simple and accurate with a relatively simple and easy to understand GUI.

1.3 Scope:

The scope of criminal face recognition system can vary depending on the specific application and context in which it is used. In general, criminal face recognition systems can be used in a variety of ways to support law enforcement and public safety efforts. Some of the key areas where criminal face recognition systems can be used include: Criminal face recognition systems can be used to quickly identify suspects or persons of interest in criminal investigations. By comparing images of an individual's face against a database of known faces, the technology can help law enforcement agencies to narrow down their search and focus their investigation on individuals who are most likely to have committed a crime. Criminal face recognition systems can also be used to track the movements of individuals who are already under investigation or who are known to be a threat to public safety. This can help law enforcement agencies to locate and apprehend individuals who may be involved in criminal activity or who pose a risk to public safety. Criminal face recognition systems can be used to identify potential threats before they can act, helping to prevent crimes from occurring in the first place. For example, the technology can be used to monitor public spaces and alert law enforcement agencies to individuals who are behaving in a suspicious or threatening manner. Criminal face recognition systems can also be used to solve cold cases by identifying suspects from old surveillance footage or other sources of images. This can help to bring closure to families and victims of unsolved crimes.

CHAPTER 2

Problem Definition

2.1. Existing System

As the crime rate and criminals are increasing day by day managing, finding and tracking these criminals is a major issue for police personnel. There are application which will help police department to store the records and data about a criminal but these applications won't help in finding those criminals. Criminal details were mainly managed using records books or stored as software records in the database. Previously when a criminal is found guilty the picture of the criminal is being taken and stored in records but these pictures serve no purpose. The existing methods will only help in managing criminal records and those methods will not finding criminals from any location.

2.2. Problems Identified:

Traditional methods of investigation can be time-consuming and require a lot of resources, which can delay the identification of a suspect. Crowded places can limit visibility, making it difficult for law enforcement officers to get a clear view of the suspect. In crowded places, time is often of the essence, as the criminal may attempt to flee the scene or blend in with the crowd. Witnesses may not have seen the suspects face clearly to make a positive identification. Physical evidence, such as fingerprints or DNA samples may be difficult to obtain. Crowded places can often have multiple suspects.

CHAPTER 3

Proposed System

This project is aimed at developing an application called Criminal Eye based on face recognition. We are able to detect and recognize faces of the criminals in an image and live from a camera in real time. We have used Haar feature based cascade classifiers in OpenCV approach for face detection. It is a machine learning based approach where a cascade function is trained from a lot of positive and negative images. It is then used to detect objects in other images. Also, we have used *(Local Binary Patterns Histograms LBPH for face recognition. This application helps police personnel in many ways. In our application we can register a criminal, once it is successfully done, we can track and find criminals using camera (CCTV footage) or by manually giving image as input. Data is each criminal is managed through dataset. When a criminal is detected at any time on camera details will be displayed. In this way a lot of time is saved and this is a highly secure process and one can detect criminals easily. Our application is 95 percent accurate and it is fast, robust, reliable and easy to use.

3.1 Features and Functionality

Using advanced algorithms and artificial intelligence to identify criminal face in real time. Can quickly and accurately identify suspects based on their facial features, providing law enforcement agencies with a powerful tool to identify criminals. This involves collecting images of suspects and storing them in a database. Requires minimal human intervention, making it faster and more reliable. Scan large databases in a matter of seconds, making it easier to identify suspects in real-time. Can enhance safety and security in communities, making it easier for law enforcement agencies to apprehend suspects and prevent future crimes.

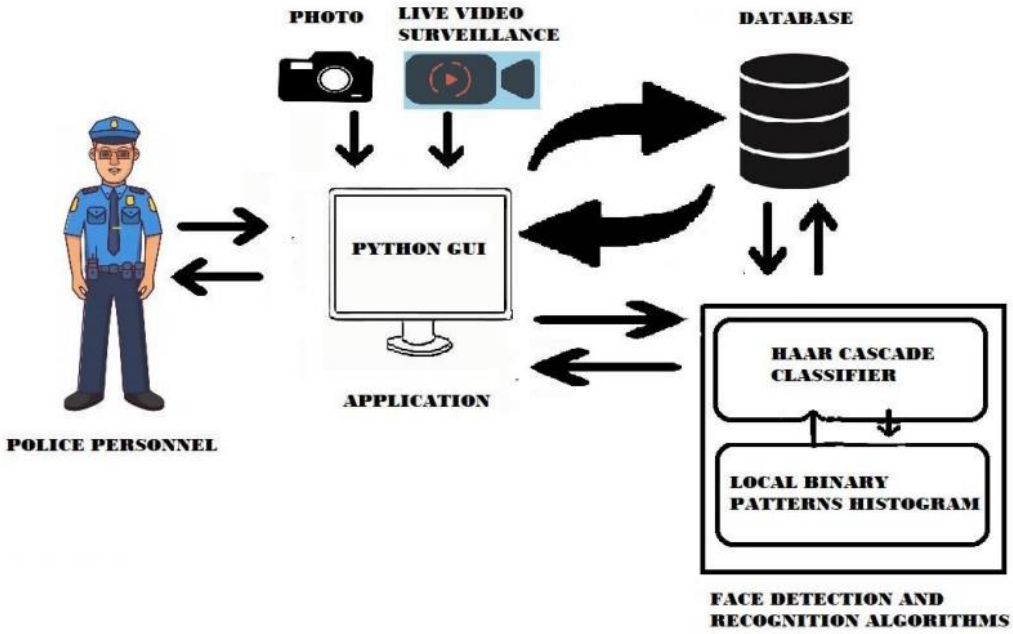


Figure 3.1: Waterfall model

CHAPTER 4

OUTCOMES

This Criminal Face Recognition will make it easier for law enforcements to find appropriate Criminals, Time, Place etc. with best identifying facilities for the Police Dept upload the image of the criminal and link it to the database. It will save resources for searching the criminal. It will also save the physical hard work and invaluable time to find the matching faces among common people. Our system will be a service which help trace criminals for Police Dept.

CHAPTER 5

SOFTWARE REQUIREMENTS

The Software Requirements Specification is produced at the culmination of the analysis task. The function and performance allocated to software as part or system engineering is refined by establishing a complete information description, a detailed functional and behavioural description, an indication of performance requirements and design constraints, appropriate validation criteria, and other data pertinent to requirements.

- The proposed system has the following requirements:

1. System needs store information about new post of criminal.
2. System needs to maintain time, date, place records.
3. System needs to keep the record of all criminals.
4. System needs to update and delete the record.
5. System also needs to capture a search area.
6. It also needs a security system to prevent data loss.

SOFTWARE REQUIREMENTS

Operating system: Windows7/8/10/11
Coding Language: Python
Data Base : PHP, MYSQL Server
Tools : Pycharm, Pyqt5,
Software Development Kit: Python 3.8

CHAPTER 6

PROJECT DESIGN

In this phase, a logical system is built which fulfils the given requirements. Design phase of software development deals with transforming the user's requirements into a logically working system. Normally, design is performed in the following in the following two steps:

- Primary Design Phase: In this phase, the system is designed at block level. The blocks are created based on analysis done in the problem identification phase. Different blocks are created for different functions emphasis is put on minimizing the information flow between blocks. Thus, all activities which require more interaction are kept in one block.

- Secondary Design Phase: In the secondary phase the detailed design of every block is performed. The general tasks involved in the design process are the following:

    1. Design various blocks for overall system processes
    2. Design smaller, compact, and workable modules in each block
    3. Design various database structures.
    4. Specify details of programs to achieve desired functionality
    5. Design the form of inputs, and outputs of the system.
    6. Perform documentation of the design.
    7. System reviews

SYSTEM DESIGN AND IMPLEMENTATION

6.1 DESIGN STANDARD

The system is designed with several interaction on each page that makes up the criminal face recognition. These cues are well-defined such as to make several functionalities that the system exposes to collect, process and output data. Access to these functionalities is made possible by the well-designed user interface which embodies several technologies to process data. The system is built in a modular form where these functionalities are built into modules. Some of the modules are as follows:

1. Create Criminal Database.
2. View Criminal Database.
3. Detect Criminal by Image.
4. Detect Criminal Real Time.

6.2 OUTPUT SPECIFICATION

The system is designed in such a way that it efficiently provides output to the user promptly and in a well-organized manner. The format for the several outputs is made available on the output pages. Output can be relayed using the following page modules:

1. View Database: This displays the criminal databases (Name, Crime committed, Last Place Found.
2. Detect Criminal by Uploading Image: This Recognizes faces of criminals by giving the name.
3. Detect Criminal Real Time: This Recognizes face of criminals realtime/live proving us with details of the criminal.

6.3 INPUT SPECIFICATION

The system is designed to accept several input details efficiently through input forms and user clicks. The data captured through the user keystrokes and clicks are received by specific modules on the system and relayed to the back end of the system for processing. Input is collected using the following page modules:

1. User Profile: This is used to view the account details like - name, mobile no., address, email id(optional). Also, user is provided with the options of edit profile and delete account.

GRAPHICAL USER INTERFACE (GUI):

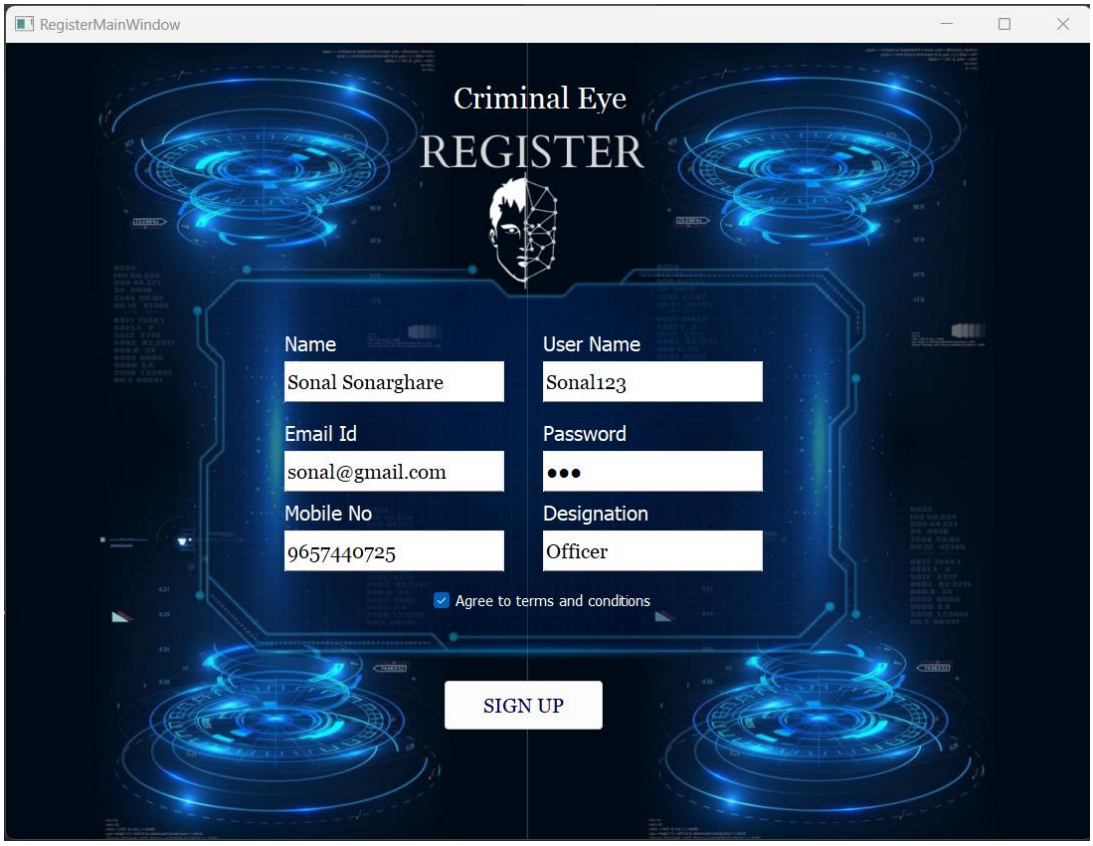


Figure 6.1: REGISTRATION PAGE

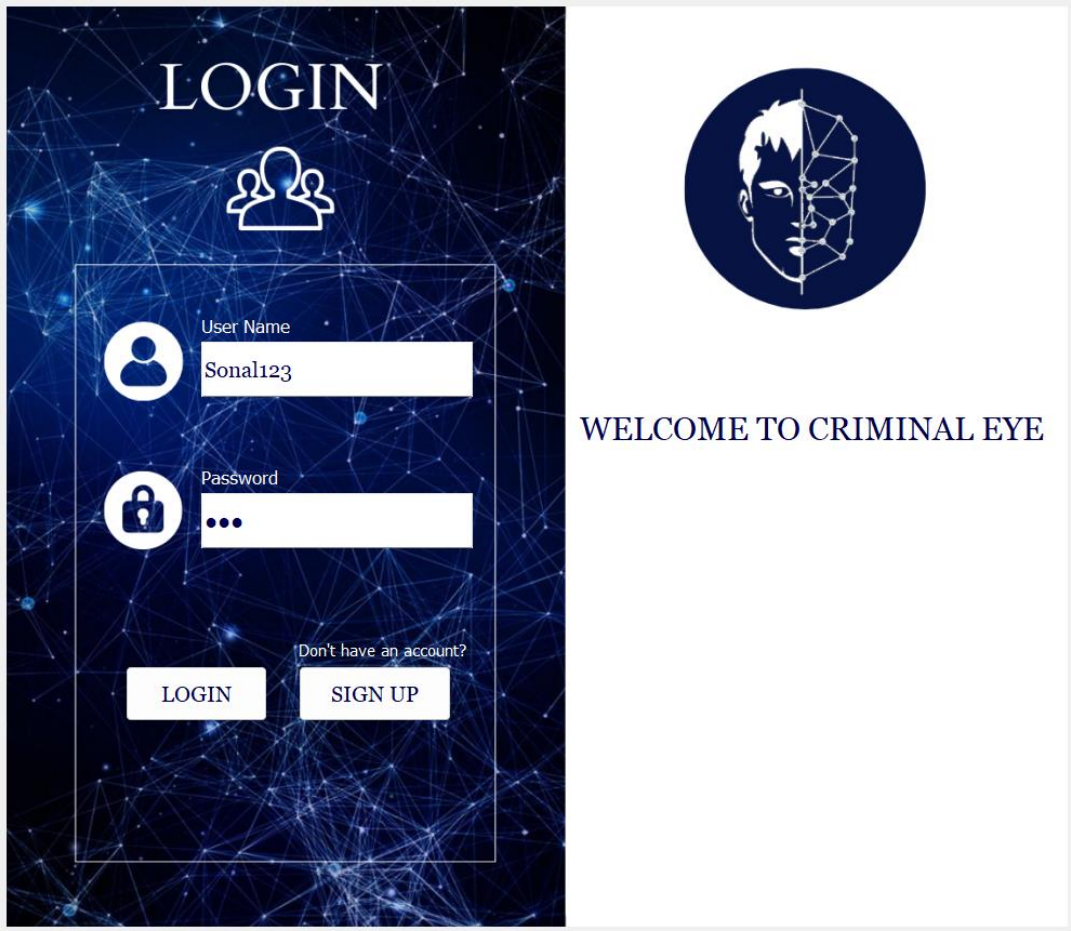


Figure 6.2: LOGIN PAGE

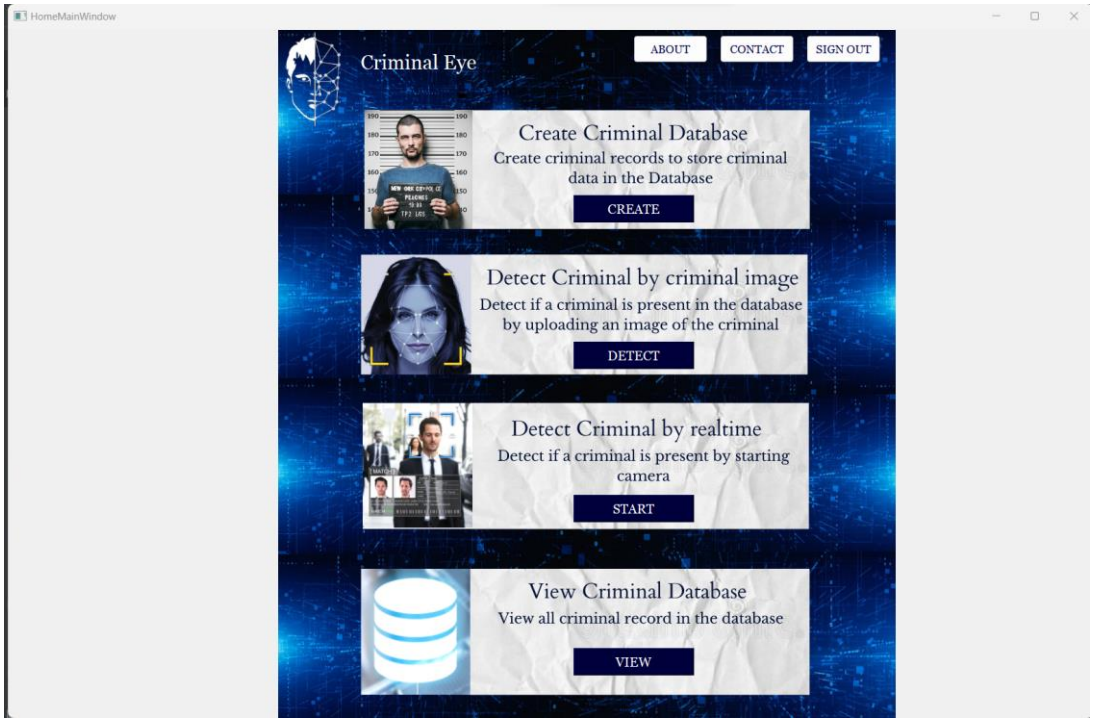


Figure 6.3: HOME PAGE

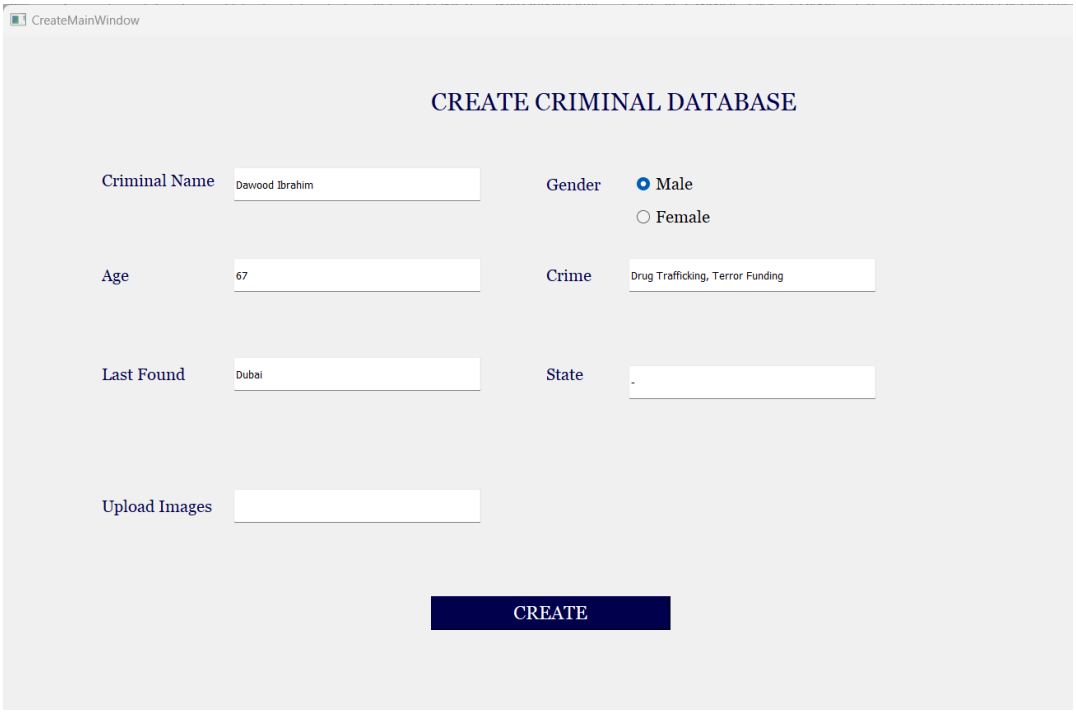
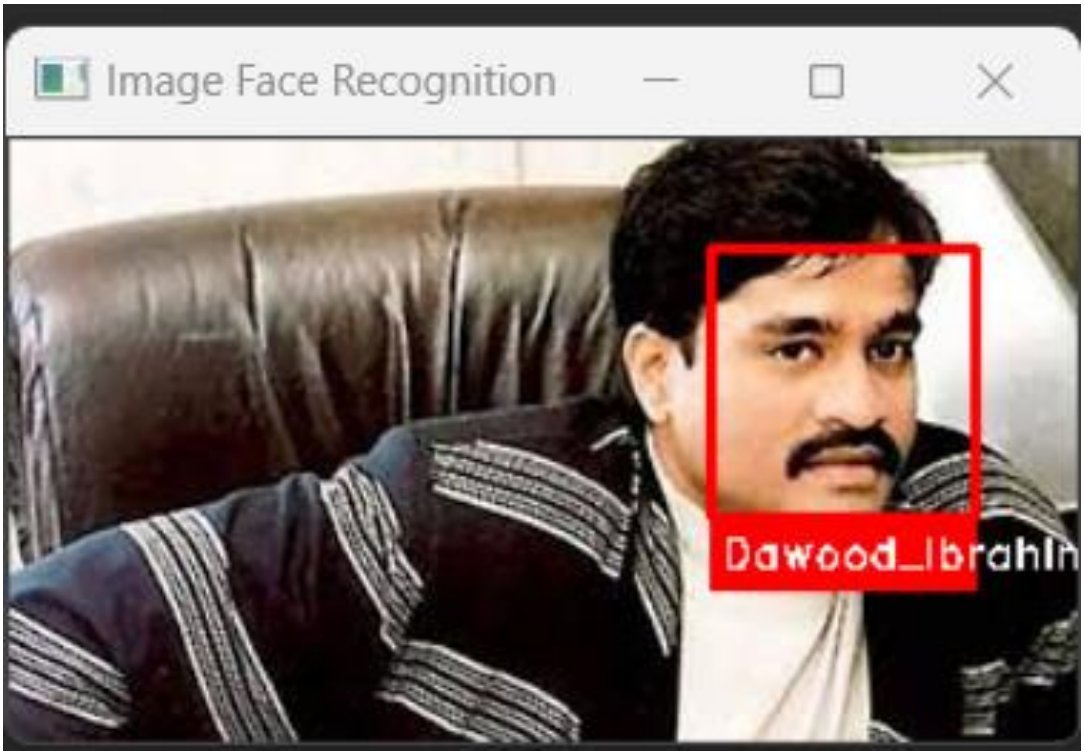


Figure 6.4: CREATE CRIMINAL DATABASE PAGE



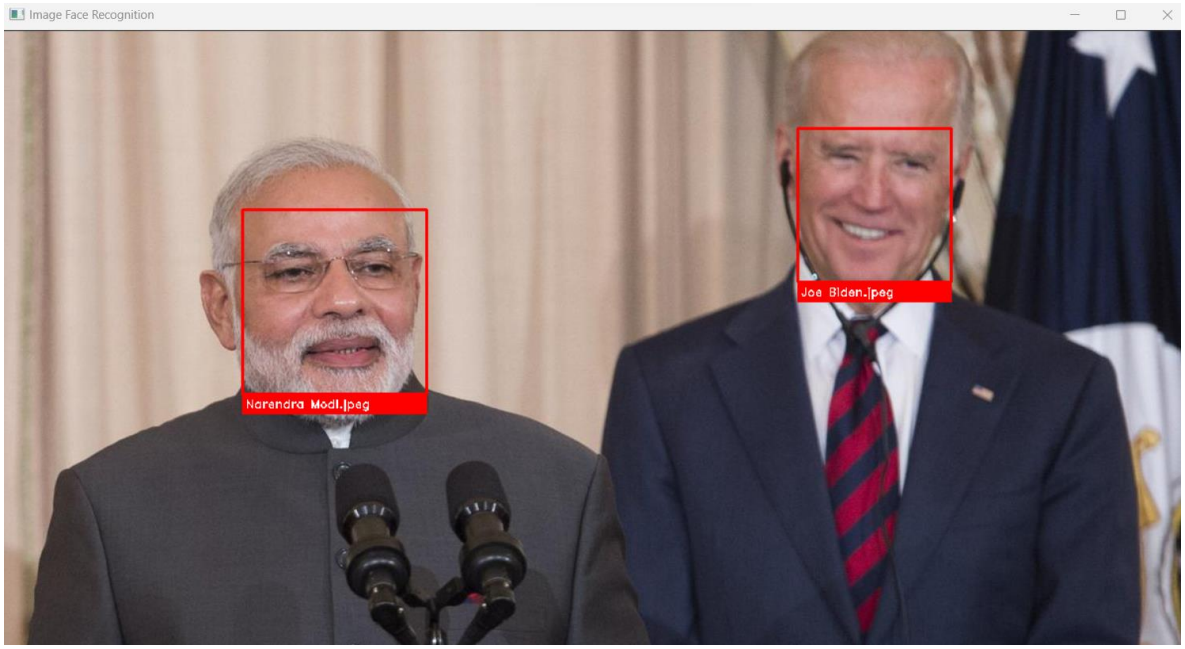


Figure 6.5: Detect Criminal by Uploading Images

6.4 DATABASE SPECIFICATION

The database system used to implement the back end of the Criminal Face Recognition is PHP-Mysql. Access to the system was made possible by a graphical interface Pyqt5 with Python 3.8. The database name is and the structure of the data tables in the database are as follows:

1. Login

2. Register

3.Create

4. Detect

5.View

CHAPTER 7

PROJECT SCHEDULING

Scheduling in this project management is the listing of activities, deliverables, and milestones within a project. A schedule also usually includes a planned start and finish date, duration, and resources assigned to each activity. Effective project scheduling is a critical component of successful time management, especially for professional service businesses.

The process for building a schedule is referred to the first six processes of time management:

1. Plan schedule management
2. Define project activities.
3. Sequence activities
4. Estimate resources.
5. Estimate durations.
6. Develop the project schedule.

Project Scheduling Template

Sr. No	Group Member	Time duration	Work to be done
1	Sonal Sonarghare	2nd week of January	Implementing Chapter / functionality (*mention the name of module/ functionality at the place of 1st module/functionality*)
2	Harsh Shelke	2nd week of january	Testing 1st module (*mention the name of module/ functionality at the place of 1st module/functionality*)
3	Meghraj Padwal	3rd week of january	Implementing 2nd module/ functionality (*mention the name of module/ functionality at the place of 1st module/functionality*)
4	Swapnil Rathod	By the end of march month	Implementing 3rd module/ functionality (*mention the name of module/ functionality at the place of 1st module/functionality*)

7.1 GANTT CHART

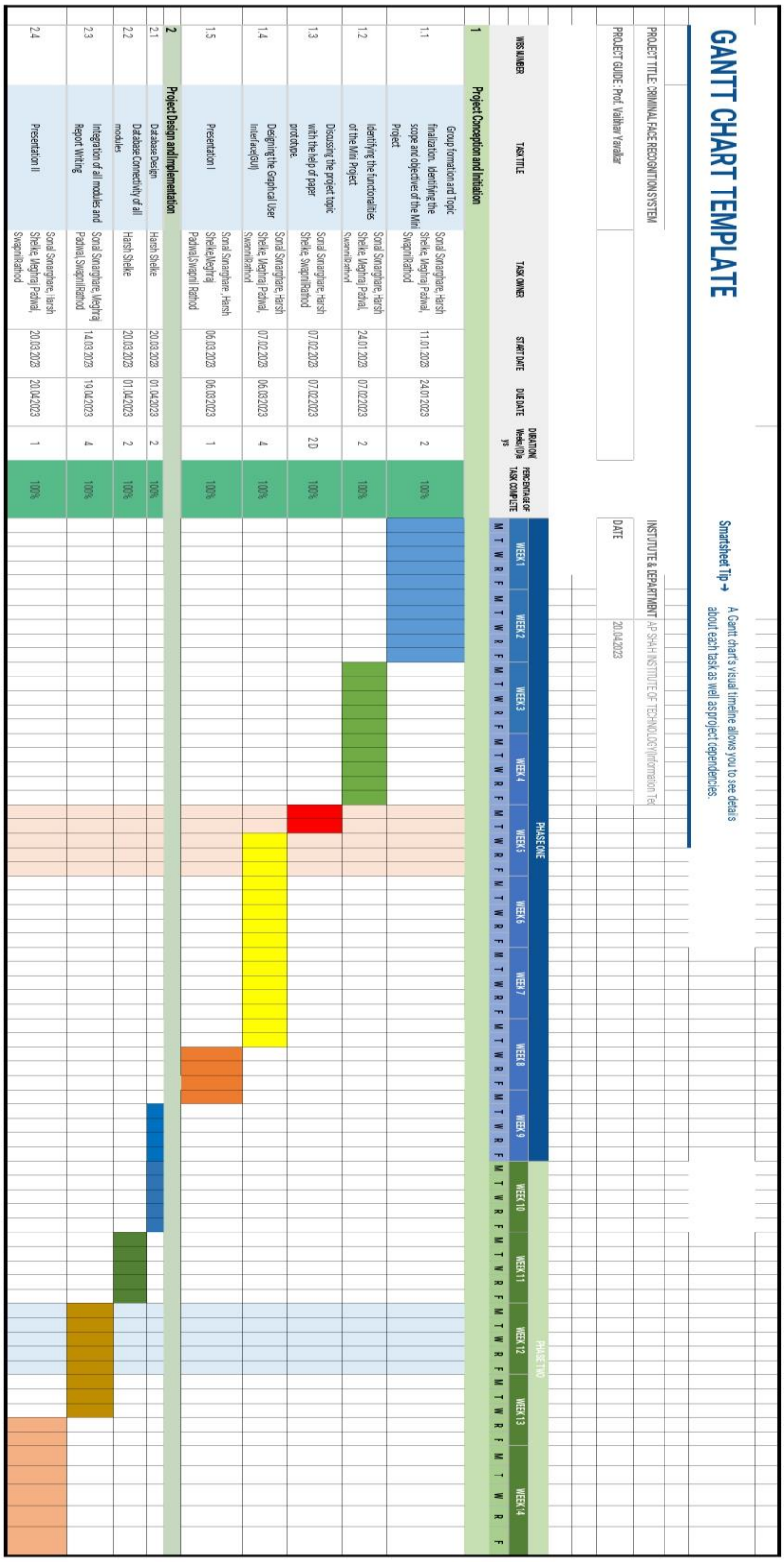


Figure 7.1: Gantt Chart

CHAPTER 8

CONCLUSION

The criminal face recognition project using Python has demonstrated the potential of computer vision and deep learning algorithms in identifying and tracking criminals. Through the development of a system that can match faces in real-time using live video feeds or uploaded images, the project has shown that Python provides a versatile and powerful programming language for implementing facial recognition algorithms.

The project has highlighted the importance of proper data preprocessing, feature extraction, and model selection in developing an accurate and efficient facial recognition system. Additionally, ethical and privacy concerns associated with the use of facial recognition technology were also considered, and efforts were made to ensure that the system's deployment is subject to appropriate regulation and oversight.

While the project's focus was on criminal face recognition, the techniques and methods used can be applied to a wide range of applications, including security, customer identification, and marketing.

The project's limitations include the need for high-quality data to train the model accurately and the potential for inaccurate results in low-light or noisy environments. Future work could focus on improving the system's accuracy, developing a more efficient face detection algorithm, and addressing the ethical and privacy concerns associated with facial recognition technology.

Overall, the project has demonstrated the value of criminal face recognition technology in law enforcement efforts to identify and track criminals. As the technology continues to evolve, it is likely that facial recognition systems will become increasingly effective and widely adopted in various industries.

At the end it is concluded that we have made effort on following points:

1. A description of the background and context of the project and its relation to work already done in the area.
2. Made statement of the aims and objectives of the project.
3. The description of Purpose, Scope, and applicability.
4. We define the problem on which we are working in the project
5. We describe the requirement Specifications of the system and the actions that can be done on these things.
6. We understand the problem domain and produce a model of the system, which describes operations that can be performed on the system.
7. We included features and operations in detail, including screen layouts.
8. We designed user interface and security issues related to system.
9. Finally, the system is implemented and tested according to test cases.

References :

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- https://youtu.be/Ca7J2l2WLOc

- https://www.youtube.com/watch?v=R5N8TA0KFxc&t=589s

- https://youtu.be/Vde5SH8e1OQ

ACKNOWLEDGEMENT

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