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REAL-TIME CRIMINAL IDENTIFICATION SYSTEM BASED ON FACE RECOGNITION

Mr.R.Prashanth Kumar [1] Abdul Majeed [2] Farhan Pasha[2] A Sujith[2]
[1]Assistant Professor, Department of CSE,[2]Final year B.Tech. students, Department of CSE,
Sreyas Institute of Engineering and Technology,Hyderabad,Telangana.

ABSTRACT

There is an abnormal increase in the crime rate and also the number of criminals are 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. Haar feature-based cascade classifier and OpenCV LBPH (Local Binary Pattern Histograms) Algorithms are used for Face detection and recognition. This system will be able to detect face and recognize face automatically in real time. An accurate location of the face is still a challenging task. Viola-Jones framework has been widely used by researchers in order to detect the location of faces and objects in a given image. Face detection classifiers are shared by public communities, such as OpenCV.

1.INTRODUCTION

Images like Picassa, Photobucket and Facebook. The automatically tagging feature adds a new dimension to sharing pictures among the people who are in the picture and also gives the idea to other people about who the person is in the image. In our project, we have studied and implemented a pretty simple but very effective face detection algorithm which takes human skin color into account. Our aim, which we believe we have reached, 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 MOTIVATION

The motivation behind this project is to provide the ease to police personnel in order to find criminals from anywhere without wasting the time and cost. This application also helps to maintain records of criminals, one can also find all the details of the criminal in our application. Therefore this application helps police in many ways.

1.2 PROBLEM DEFINITION

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.

1.3 OBJECTIVE OF A PROJECT

- 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.

2. 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.

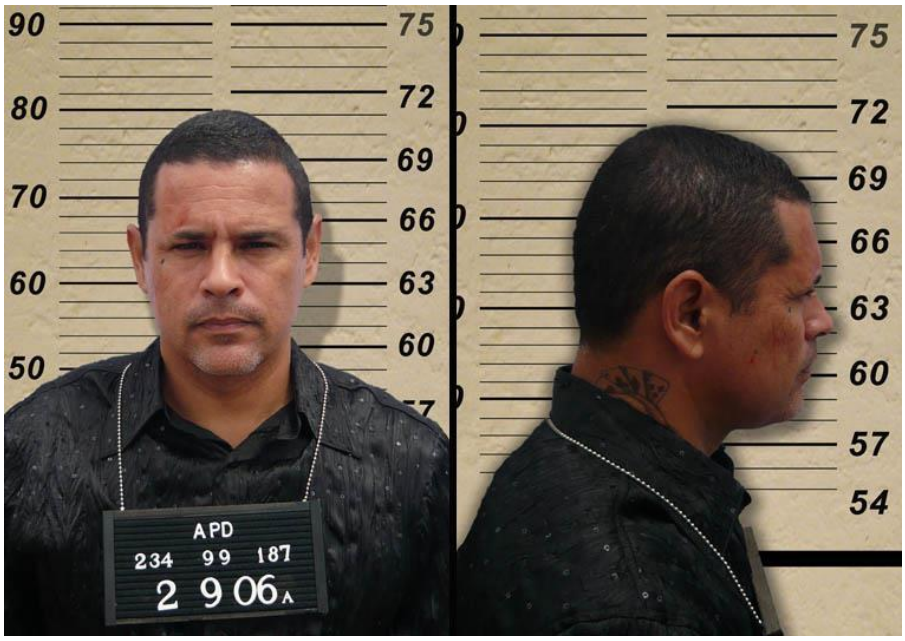

FIGURE 1 – MUGSHOTS OF CRIMINALS CAN BE USED TO TRACK AND MONITOR CRIMINALS

2.1. DISADVANTAGES OF EXISITING SYSTEM

- It is not possible to detect criminal from any location
- Existing methods only provide data storage and security for data but **not live tracking**.There was no application which will find criminals from CCTV footage.
- Criminal details were stored manually in a record and it requires lot of work
- Information can be lost or manipulated in records easily.
- Previous applications were not 100 percent accurate and this leads to inaccurate information of criminal.

3. PROPOSED SYSTEM

This project is aimed at developing an application called Real-Time criminal identification system based on face recognition. We are able to detect and recognize faces of the criminals in an image and in a video stream obtained 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 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 (CCTV) criminal

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. ADVANTAGES OF PROPOSED SYSTEM

- It helps police personnel to track and find criminals easily.
- It requires very less men power and the cost of the operation is very less.
- In this application the information cannot be manipulated or lost and data will be safe.
- This system can be used by police or investigation department to recognize criminal from their faces.
- This application can recognize faces in different lighting conditions with high accuracy
- The application is fast, robust, reasonably simple and accurate with a relatively simple and easy to understand algorithms and technique.

4. ARCHITECTURE

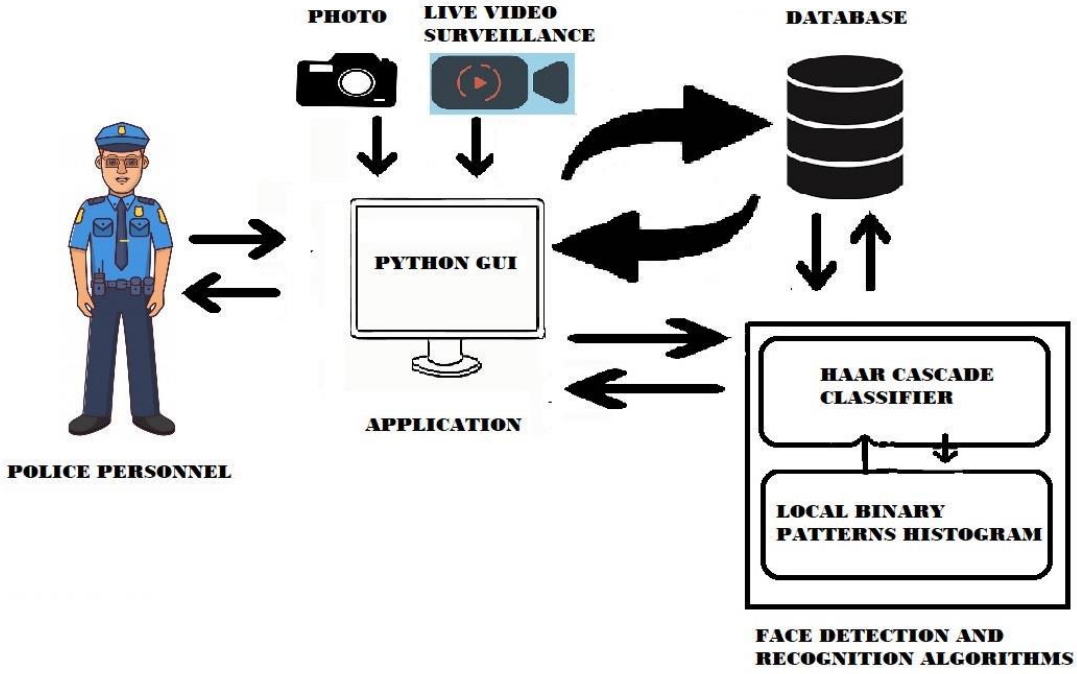

FIGURE 2 – ARCHITECTURE OF REAL-TIME CRIMINAL IDENTIFICATION USING FACE RECOGNITION

5.TEST CASES

#TEST CASE FOR CRIMINAL REGISTRATION

Req_Id	Tkt_Id	Req_Description	Actual_o/p	Expected_o/p	Tkt_status
1.	101	During registration of criminal, 5 criminal photos must be uploaded with faces in it.	Registration successfull	Registration successful	PASS
	102	If NO faces found in images.	NO faces found error message	NO faces found error message	PASS
	103	If less than 5 images are selected	Alert message Please select 5 images	Alert message Please select 5 images	PASS
	104	If above 5 HD images are selected then.	Memory Limit exceeded	Memory Limit exceeded	PASS

TABLE : TESTCASES FOR CRIMINAL REGISTRATION

#TEST CASE FOR DETECT CRIMINAL:

Req_Id	Tkt_Id	Req_Description	Actual_o/p	Expected_o/p	Tkt_status
2.	201	Upload image from pictures and if criminal is found.	Criminal details will be displayed	Criminal details will be displayed	PASS
	202	Upload image from pictures and if criminal is not found.	No criminal recognized message	No criminal recognized message	PASS

TABLE : TEST CASES FOR DETECT CRIMINAL

#TEST CASE FOR VIDEO SURVEILLANCE

Req_Id	Tkt_Id	Req_Description	Actual_o/p	Expected_o/p	Tkt_status
3.	301	Web cam will be opened for live surveillance.	Web cam will open successfully and will start recognizing criminals	Web cam will open successfully and will start recognizing criminals	PASS
	302	Web cam will be opened for live surveillance.	Web cam won't open due to some access privileges	Web cam will open successfully and will start recognizing criminals	FAIL

TABLE : TEST CASES FOR VIDEO SURVEILLANCE

6.RESULTS

6.1 OUTPUT SCREENSHOTS

The following are the output screenshots of Real-Time criminal identification system based on face recognition. This is the basic look of this application. Whenever user opens the application the following window will appear initially.

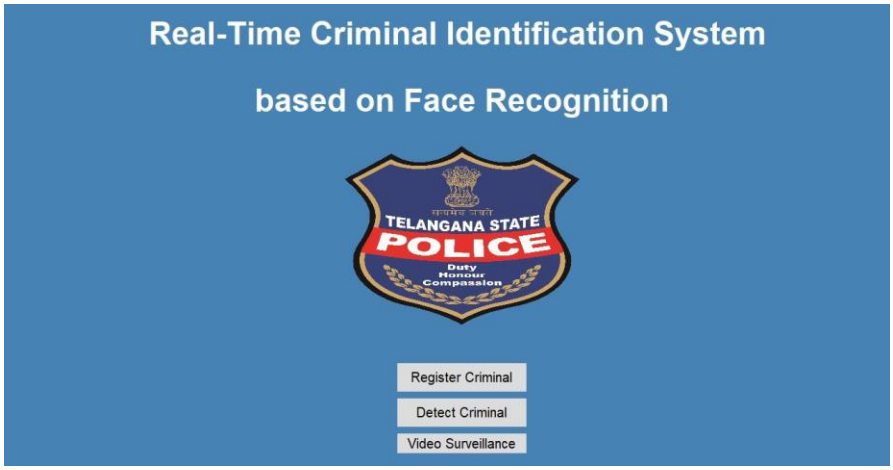

FIGURE 3: OUTPUT

User can select the different options that are in the application as shown below. First user should register the criminal by selecting the register criminal option.Once the registration is successful the below screen will appear.

FIGURE 4: MESSAGE BOX SHOWING SUCCESSFUL REGISTRATION OF CRIMINAL

During registration the images that are uploaded will be trained in the background and all the criminal details will be saved as shown in the below image.

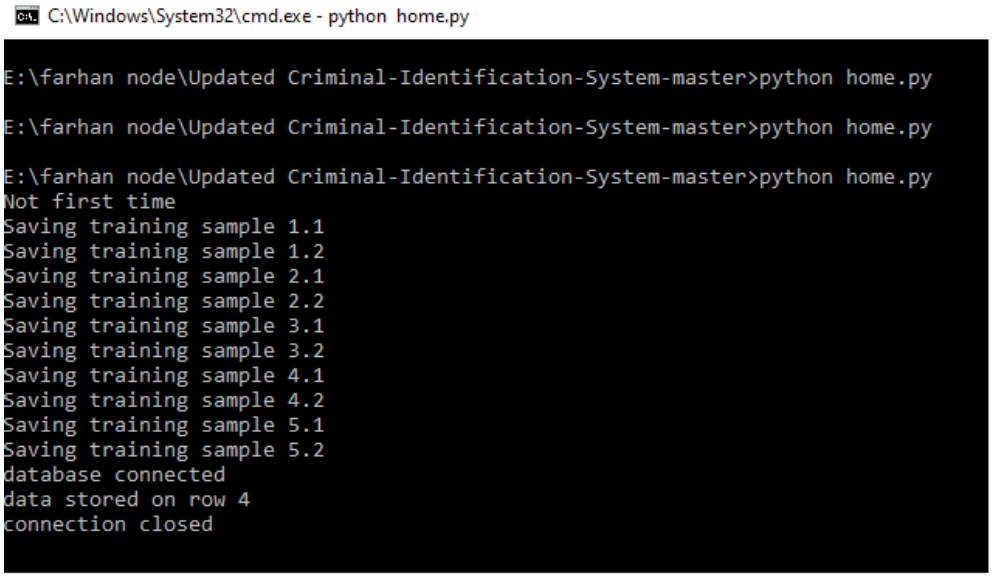

FIGURE 5: TRAINING IMAGES AND SUCCESSFULLY STORING DETAILS IN DATABASE

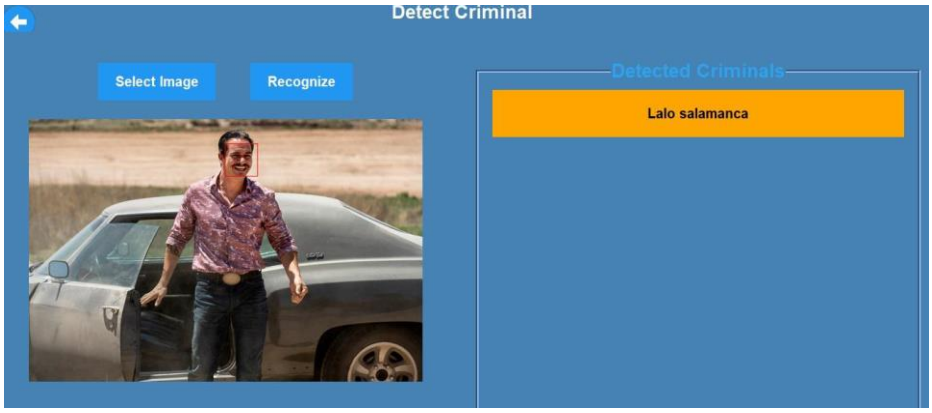

FIGURE 6: WHEN USER SELECTS DETECT CRIMINAL OPTION

FIGURE 7: CRIMINAL DETAILS

FIGURE 8: CRIMINAL RECOGNITION USING LIVE SURVEILLANCE

7.CONCLUSION

After considering all the facts present in introduction section, we did research in different applications and came up with a solution. Real-time criminal identification system will help police to control crime rate. This application helps them in many different ways. With the advancement in security technology and installation of cameras throughout the public areas, it will become easier for police personnel to monitor, track and find criminals from police control room using this application.

In future advanced face recognition techniques can be used to improve the results and login page must be created so that any police personnel can access this application remotely. Moreover if a criminal is found in a particular zone then alert messages should be send to nearby police stations. The application that is developed is a simple and user friendly. By using advanced CSS styles and different front-end technologies, interface of the application can be developed more according to user requirements.

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