**Smart Face Recognition System**

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**Problem Statement:** Face recognition is the theme of our project. It is the next step for implementation of Artificial Intelligence.

**Overview:** Due to increase in the day to day criminal activities and also slow action of our security forces especially police to nab the culprit leading to a less secure society. In India we have seen many 'CCTV' cameras around us which are less in number and these cameras just record the day to day activity in database. It does not provide any alert system for the people from an unknown person. For an instance the police get an eyewitness who saw a murder or any other crime & he/she knows the face structure of the culprit then the police call a sketch artist to retrieve the image of that person which takes lot more time. Above drawbacks can be overcome by several techniques which are including „Real Time Face Detection‟ in which it recognize the face of suspect or criminal in real time and inform to its nearby police headquarters, secondly „Sketch for Match - 'CBIR' using sketches‟ contains retrieving of face of the suspect or criminal with the help of an eyewitness in less amount of time and lastly the „pattern Matching‟ in which it considers every available evidence and match it with the pattern stored in the database, retrieve the list of suspected people and show it for that crime. It is only done in case of robbery, theft and burglary.

1. INTRODUCTION

In this fast growing world information plays an important role in our life. Also in some countries like India and Sri Lanka there is a requirement of efficient criminal identification software which helps them to identify and nab the culprit in mean time. So it will help the security system to work faster and which helps to secure the society. As we know the rate at which criminal activities are growing and reaction of our police towards sensitive situations. So there is need of a system which satisfies all the security requirements.

In the proposed system which is based on concept of “Smart Face Recognition System” satisfies maximum requirements. The proposed project of “Smart Face Recognition System” uses webcam to detect and recognize the face of person coming in front of it. Then all the information regarding the image or detected face will be displayed. The “Smart Face Recognition System” is a system to be used by our security departments to identify the criminal by observing it by a camera or making its sketch from another person. Many of the image processing measures will be utilized during implementation of the project like image capturing, pre-processing, storing in database, comparison from database etc. on a successful match; a message is send to its nearby police station of captured information. The main objective of this project is to detect and recognize the face of suspected person coming in front of the camera, retrieve the sketches of suspected person and present its information to the user. As there are many images stored in database, so it will take a minute scale of time to find the correct image, so there is need of correct implementation of algorithm for image processing and data handling. After finding correct object image, a sms containing the information about the detected image or person is send to its nearby police station. If image is not present in the database then it will store it for future use.

1. PURPOSE

We have seen that they are still using old techniques to handle tedious tasks in crime investigation. This increases insecurity in society which is not acceptable. While reviewing various things regarding our project either the difficulties or challenges we have noted two main points:

1. PREVIOUS SYSTEM

Their way of investigation is far behind than that of other countries. For example the CCTV cameras provided in many areas in the city but it does not repay a good result to us. They still used the old techniques to retrieve sketches of suspected person. They did not save the evidences of previous crime scenes due to which it takes more than enough time to nab the criminals.

1. PROPOSED SYSTEM

We are proposing this software in which will enhance the technology of CCTV cameras in which it provides an alert system for the security forces (police departments) in real time through which they can spontaneously take action for that we are proposing efficient sketch base software through which we can easily retrieve the picture of suspected person from the eyewitness. As saving data regarding the evidences available at the crime spot in the database and use it for the future conditions.

1. DESCRIPTION

The Smart Face Recognition System provides real time information about the images or video placed in front of camera. The product functions are more or less the same as describe in product perspective. The functions of the system include the system providing different type of services based on type of module. This system mainly uses Eigen-face detection algorithm.

In this algorithm we manage 3 different things to extract the pixels of the face so as to calculate and store it in database. First it identifies the pixels in a particular face region, plot it apparently using graphics and manage the neighbouring pixels so as to configure the pixels accurately.

To extract from a particular region two algorithms are used precisely i.e. Harr-cascade classification and edge detection algorithm. In edge detection case we increase the brightness and contrast of the image due to which lines going to generate which are mainly the edges of various face features. In case of Harr-cascade classification a particular image is place it eh coordinate axis with plot (x, y) and it is rotated to about 45 degree so that regions of face can be detect easily. This classification is done until the whole face is covered.

* + The user should be provided with updated information of the suspected images or culprits.
  + The admin is given a provision to check his account information and change the account information any time.
  + The user can get the information about the images or videos which are placed in front of camera.
  + The admin is provided with interfaces to add/delete the characteristics of the information available in the database. The system uses internet to interconnect with the surrounding systems for efficient matchup.

1. USER INTERFACES
   * System login interface that use for validate the user
   * Main view (an interface for searching for details) using the interface user can, Upload a digital image

Validated updated image Search for details

* + Searched criminal details interface

Interface that requires showing all the detail that user has searched.

* + Add criminal details interface user for add new details of the criminal Add information of criminals

Validate information

* + Criminal detail modification interface
  + Administrator interface

Add users, Edit users, Delete users, View users, User accounting.

1. IMPLEMENTATION OF SFRS

There are some hardware and software requirements needs to be fulfilled in accordance with its implementation. The minimum requirements are:

**Camera**: 1 webcam with better resolution (if necessary), **RAM**: 2GB, **Processor**: Intel dual core processor (1.6 GHz), **Hard disk requirement**: 60 GB, **Operating system**: windows platform (XP/7/8), Microsoft .NET Framework 3.0, **Language**: c#, **Front end**:

.NET, **Backend**: SQL server.

1. RESULT ANALYSIS

If a witness or a forensic report is available on a crime incident identification of criminals is a different case. SFRS is used to suggest possible criminals in situations where a witness or forensic reports are not available in case of face detection. The experimentations are carried out on data obtained from crime records division of Indian police. While recognizing the details of criminal will be shown to the user. The end users will be the police officers who require information about criminals when following a certain case. They will need to have the knowledge about using web interface, logging in properly, uploading a digital image and updating new database record. The administrator will need to have advanced knowledge for user account management and usage of web interface as well as about WANs and VPNs. As modules for face recognition and sketch match is different so the end result is divided in two different phase.

1. RESULT FOR FACE RECOGNITION

This section provides you the real time detected face and its location. When the camera detects the face of the person it then sends a message regarding the suspected person including its location within few seconds to its nearby police station. It requires specific hardware to send the message. As soon as the user receives the message he/she can alert other people in probable time.

1. CONCLUSION

Thus we have concluded that through this project we can provide our society a secure environment but it needs lot more efforts for that as it is not easy but once it get implemented it will be one of the efficient project to be build for police departments. This project also enhances the efficiency of operations handle by police departments. It can also help us to minimize the terrorist activities and may help to nullify various terrorist attacks happen in the cities. The ability of storing suspect details that were arrested for at least one crime incident but not proved as the responsible criminal by the court, and the efficiency in identifying possible criminals for a crime incident are the characteristics that makes SFRS perfect than other crime investigation tools.

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