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# A Real Time Criminal Face Recognition Using an Automated Surveillance Camera

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**ABSTRACT:** In this paper, we proposed the students' attention level to the explanation of a given lecture is a factor that might determine the capability of retention and subsequent application of a learned concept. For this reason, students that pay attention are generally more participatory in the learning/teaching process than those who don't, and consequently, they succeed in reaching the competencies proposed in the courses. Hence, it is important to design strategies and tools that help teachers to monitor in a non-invasive way the attention level of the students, allowing them to take actions to modify the dynamics of the lectures when needed.

In this work, we introduce a fully automated system to monitor the students' attention based on computer vision algorithms. To this end, we feed a recurrent neural network with onesecond sequences generated by facial landmarks. This spatiotemporal analysis of video recordings allows for identifying when a student is attending a given explanation in online educational environments. The system is tested in a database with more than 3000 sequences of students who pay or no attention to online video lectures. Obtained results show that the proposed system is suitable to monitor the students' attention to a particular explanation.

## I. INTRODUCTION

To detect and recognize the face and we can differentiate between citizen and criminals and further investigate whether the identified person is criminal or not, using machine learning algorithm. Modules used are data set collection, algorithm and detection. In the first module we collect data, in second one we train the data and apply algorithm, finally in the last module detection process is done. After that, the detected value passes to android user via firebase.

## II. LITERATURE SURVEY

In practice, identification of criminal in Malaysia is done through thumbprint identification. However, this type of identification is constrained as most of criminal nowadays getting cleverer not to leave their thumbprint on the scene. 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. However, because of limited software developed to automatically detect the similarity between photo in the footage and recorded photo of criminals, the law enforce thumbprint identification. In this paper, an automated facial recognition system for criminal database was proposed using known Principal Component Analysis approach. This system will be able to detect face and recognize face automatically. This will help the law enforcements to detect or recognize suspect of the case if no thumbprint present on the scene. The results show that about 80% of input photo can be matched with the template data.

A Criminal Identification System allows the user to identify a certain criminal based on their biometrics. With advancements in security technology, CCTV cameras have been installed in many public and private areas to provide surveillance activities. The CCTV footage becomes crucial for understanding of the criminal activities that take place and to detect suspects. Additionally when a criminal is found it is difficult to locate and track him with just his image if he is on the run. Currently this procedure consists of finding such people in CCTV surveillance footage manually which is time consuming. It is also a tedious process as the resolution for such CCTV cameras is quite low. As a solution to these issues, the proposed system is developed to go through real time surveillance footage, detect and recognize the criminals based on reference datasets of criminals. The use of facial recognition for identifying criminals



proves to be beneficial. Once the best match is found the real time cropped image of the recognized criminal is saved which can be accessed by authorized officials for locating and tracking criminals or for further investigative use.

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.

Human face is the significant characteristic to identify a person. Everyone has their own unique face even for twins. Thus, a face recognition and identification are required to distinguish each other. A face recognition system is the verification system to find a person's identity through biometric method. Face recognition has become a popular method nowadays in many applications such as phone unlock system, criminal identification and even home security system. This system is more secure as it does not need any dependencies such as key and card but only facial image is needed. Generally, human recognition system involves 2 phases which are face detection and face identification. This paper describes the concept on how to design and develop a face recognition system through deep learning using OpenCV in python. Deep learning is an approach to perform the face recognition and seems to be an adequate method to carry out face recognition due to its high accuracy. Experimental results are provided to demonstrate the accuracy of the proposed face recognition system.

Face recognition is one of the most challenging topics in computer vision today. It has applications ranging from security and surveillance to entertainment websites. Face recognition software are useful in banks, airports, and other institutions for screening customers. Germany and Australia have deployed face recognition at borders and customs for Automatic Passport Control. Human face is a dynamic object having high degree of variability in its appearance which makes face recognition a difficult problem in computer vision. In this field, accuracy and speed of identification is a main issue. Many challenges exist for face recognition. The robustness of the system can be obstructed by humans who alter their facial features through wearing colored contact lenses, growing a mustache, putting on intense make-up, etc. Ethical concerns are also related to the process of recording, studying, and recognizing faces. Many individuals do not approve of surveillance systems which take numerous photographs of people who have not authorized this action. The goal of this paper is to evaluate face detection and recognition techniques and provide a complete solution for image based face detection and recognition with higher accuracy, better response rate and an initial step for video surveillance. Solution is proposed based on performed tests on various face rich databases in terms of subjects, pose, emotions and light.

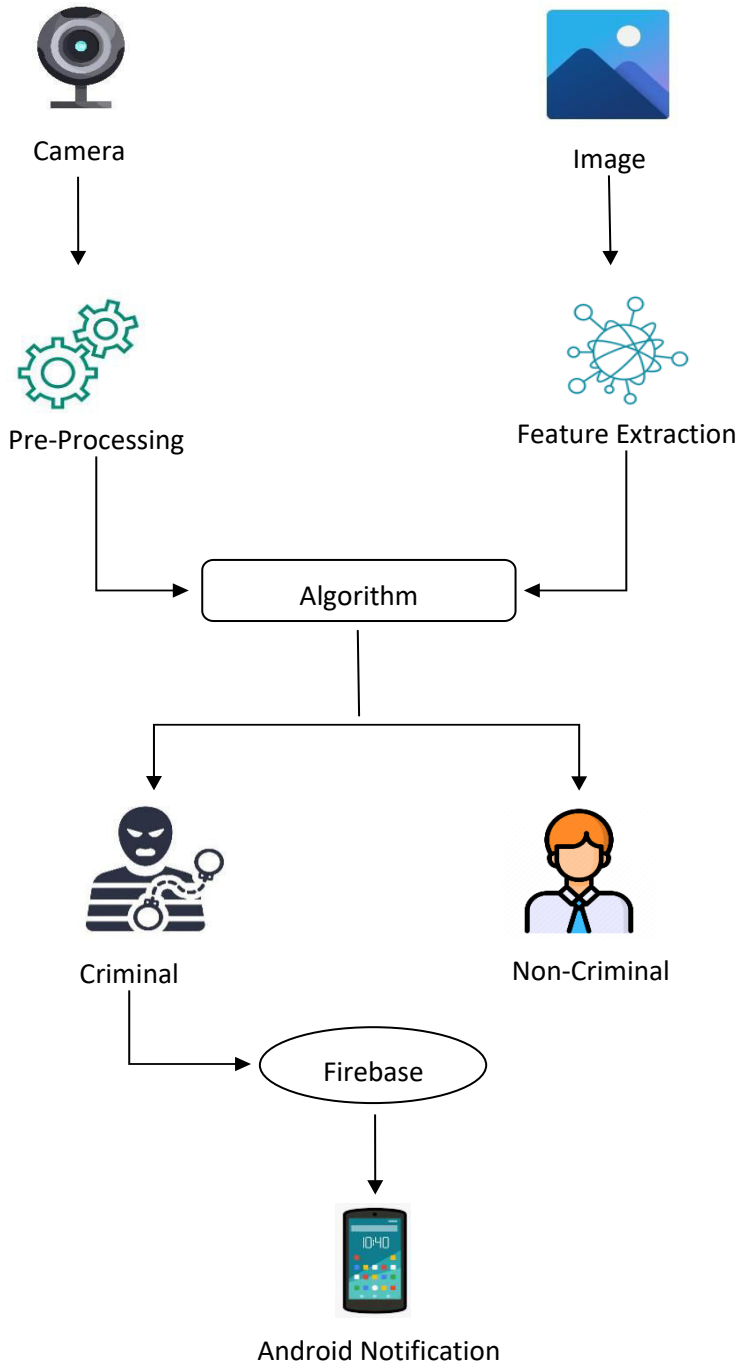
### III. PROPOSED SYSTEM

The proposed system consists of 4 steps, including training of real time images, multiple face detection, comparison of trained real time images with images from the surveillance camera, result based on the comparison. In our proposed system, the video obtained from the camera will be converted into frames. When a face is detected in a frame, it is preprocessed where noise and redundancies are reduced. The processed real time image is compared with the processed images already stored in the database. If he is criminal/suspect, we get a notification from android through firebase. Three modules are used in this project are dataset collection, algorithm and detection. we collect a data manually and store as a dataset. That collected data will be trained for getting high accuracy result or identification. After getting trained dataset, that data will be given to the machine learning algorithm. Machine learning algorithm analyzes the data. Here the data will be analyzing frame by frame to identify the criminal. In the detection process, the live footage will be getting from the open-CV. Then the analyze start from the first frame. It continuously starts comparing the current video frame to trained data set. If the suspect is found, it shows the name, id and wanted label on the screen.

After that, the detected value passes to android user via firebase.



**ARCHITECTURE DIAGRAM**



**IV. CONCLUSION**

In this project, the video obtained from the camera will be converted into frames. When a face is detected in a frame, it is preprocessed where noise and redundancies are reduced. The processed real time image is compared with the processed images already stored in the database. If he is criminal/suspect, we get a notification from android



through firebase. we are able to detect and recognize faces of the criminals in an image and in a video stream obtained from a camera in realtime we can differentiate between citizen and criminals and further investigate whether the identified person is criminal or not.

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