Face Recognition Based Attendance System with Auto Alert to Guardian using Call and SMS

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ABSTRACT

Now a days the wise attending management system victimization face detection techniques. Daily attending marking could also be a typical and vital activity in colleges and colleges for checking the performance of students. Manual attending maintaining is tough methodology, significantly for large cluster of students. Some machine-driven systems developed to x beat these difficulties, have drawbacks like worth, faux attending, accuracy, meddlesomeness. To beat these drawbacks, there is need of good and automatic attending system. We've a bent to unit implementing attending system victimization face recognition. Since face is exclusive identity of person, the problem of pretend attending and proxies could also be resolved. The system uses native binary pattern face recognition technique because it is fast, straightforward and has larger success rate. Also, it's pro-vision to have an effect on intensity of sunshine draw back and head produce draw back that produces it effective. This wise system could also be degree effective because of maintain the degree will-less squat recognition system is planned supported appearance-based choices that concentrate on the shortened squatter image rather than native countenance. The remainder step in squatter recognition system is squatter detection Viola-Jones squatter detection methodology that capable of method photos terribly whereas achieving higher detection rates is utilized. The complete squatter recognition methodology could also be divided into a pair of parts squatter detection and squatter identification. For face detection, Viola Jones face detection methodology has been used out of the many face detection ways that. Once face detection, face is cropped from the actual image to urge obviate the background. Chemist faces and shear faces ways that are used for face identification. Average photos of subjects area unit used as coaching job set to spice up the accuracy of identification.

Keywords: Face Authentication, Vailo and Jones Algorithm, SMS, Auto Call

I. INTRODUCTION

The system permits simple attending management victimization the Face Detection, that's one in each of the foremost acceptable techniques. The teacher should carry a Digital Image Capturing Devices to the room and take a picture of the students. The teacher then should log-in to the computer victimization his/her login credentials. System together consists of information which contains photos of all the students and their personal details. The information together keeps record of details of lecturers of the assorted classes. Once the image is uploaded to the system, faces of scholar's are detected from the image hold on. These photos are then compared with {the photos pictures} the photographs} of student's hold on images inside the information victimization face recognition algorithmic rule and record of attending is unbroken. In many institution and Organization the attending is also a necessary issue to take care of the record of lectures, pay and work hours etc. Most of the institutes and organizations follow the manual technique exploitation previous paper and lupus technique and a number of them have shifted to biometric technique. this system that schools use is that the professor passes a sheet or build roll calls and mark the attending of the students and this sheet a lot of goes to the admin department with updates the final surpass sheet. This method is reasonably feverish and time intense. Also, for professors or employees at institutes or organizations the biometric system serves one at a time. So, why not shift to an automatic attending system that works on face recognition technique? Be it a class space or entry gates it will mark the attending of the students, professors, employees, etc.

II. SYSTEM OVERVIEW

This system uses Viola and Jones formula for detective work and recognizing the faces.

The main elements of this technology square measure as follows:
A. Face Detection.
B. Face Recognition.

A. Face Detection: Face detection is also a technology being utilized throughout a sort of applications that identifies human faces in digital footage. Face detection collectively refers to the psychological methodology by

that humans notice and attend to faces throughout a visible scene. Face detection is taken into account a selected case of object-class detection. In object-class detection, the task is to seek out the locations and sizes of all objects in a very image that belong to a given class. Examples embody higher torsos, pedestrians, and cars. Face-detection algorithms focus on the detection of frontal human faces. It's analogous to image detection throughout that the image of somebody is matched bit by bit. Image matches with the image stores in information. Any facial feature changes inside the data will invalidate the matching methodology. A reliable face-detection approach supported the genetic formula and also the

B. Face Recognition: A face recognition system is also a laptop application capable of distinctive or accessory somebody from a digital image or a video frame from a video offer. One amongst the ways in which to do to the current is by scrutiny elects countenance from the image and facial information. It always utilized in security systems and will be compared to completely different life science like fingerprint or eye iris recognition systems. Some face recognition algorithms verify countenance by extracting landmarks, or options, from an image of the themes face. For example, associate degree formula might analyze the relative position, size, and/or variety of the eyes, nose, cheekbones, and jaw. These choices square measure then used to hunt for completely different footage with matching choices. Completely different algorithms normalize a gallery of face footage then compress the face info, exclusively saving the knowledge inside the image that is helpful for face recognition. An exploration image is then compared with the face info. One amongst the earliest productive systems is based on guide matching techniques applied to a group of salient countenance, providing a variety of compressed face illustration.

III. LITERATURE SURVEY

Paper 1:-Face Recognition under Varying Illumination Using Gradient faces.

Author Name: -Taiping Zhang ; Yuan Yan Tang ; Bin Fang ; Zhaowei Shang ; Xiaoyu Liu.

Description: -In this correspondence, we propose a novel method to extract illumination insensitive features for face recognition under varying lighting called the gradient faces. Theoretical analysis shows gradient faces is an illumination insensitive measure, and robust to different illumination, including uncontrolled, natural lighting. In addition, gradient faces is derived from the image gradient domain such that it can discover underlying inherent structure of face images since the gradient domain explicitly considers the relationships between neighboring pixel points. Therefore, gradient faces has more discriminating power than the illumination insensitive measure extracted from the pixel domain. Recognition rates of 99.83% achieved on PIE database of 68 subjects, 98.96% achieved on Yale B of ten subjects, and 95.61% achieved on Outdoor database of 132 subjects under uncontrolled natural lighting conditions show that gradient faces is an effective method for face recognition under varying illumination. Furthermore, the experimental results on Yale database validate that gradient faces is also insensitive to image noise and object artifacts (such as facial expressions).

Paper 2:- Student Attendance System in Classroom Using Face Recognition Technique.

Author Name: -Samuel Lukas, Aditya Rama Mitra, Ririn Ikana Desanti, Dion Krisnadi.

Description: -Authentication is one of the significant issues in the era of information system. Among other things, human face recognition (HFR) is one of known techniques which can be used for user authentication. As an important branch of biometric verification, HFR has been widely used in many applications, such as video monitoring/surveillance system, human-computer interaction, and door access control system and network security. This paper proposes a method for student attendance system in classroom using face recognition technique by combining.

**Author Name: -**GuangzhengYang, Thomas SHuang.

Description: -The human face is a complex pattern. Finding human faces automatically in a scene is a difficult yet significant problem. It is the first important step in a fully automatic human face recognition system. In this paper a new method to locate human faces in a complex background is proposed. This system utilizes a hierarchical knowledge-based method and consists of three levels. The higher two levels are based on mosaic images at different resolutions. In the lower level, an improved edge detection method is proposed. In this research the problem of scale is dealt with, so that the system can locate unknown human faces spanning a wide range of sizes in a complex black-and-white picture. Some experimental results are given.

Paper 4:-Study of Implementing Automated Attendance System Using Face Recognition Technique.

Author Name: -Nirmalya Kar, Mrinal Kanti Debbarma, Ashim Saha, and Dwijen Rudra Pal.

Description: -Authentication is a significant issue in system control in computer based communication. Human face recognition is an important branch of biometric verification and has been widely used in many applications, such as video monitor system, human-computer interaction, and door control system and network security. This paper describes a method for Student's Attendance System which will integrate with the face recognition technology using Personal Component Analysis (PCA) algorithm. The system will record the attendance of the students in class room environment automatically and it will provide the facilities to the faculty to access the information of the students easily by maintaining a log for clock-in and clock-out time.

IV. ARCHITECTURE
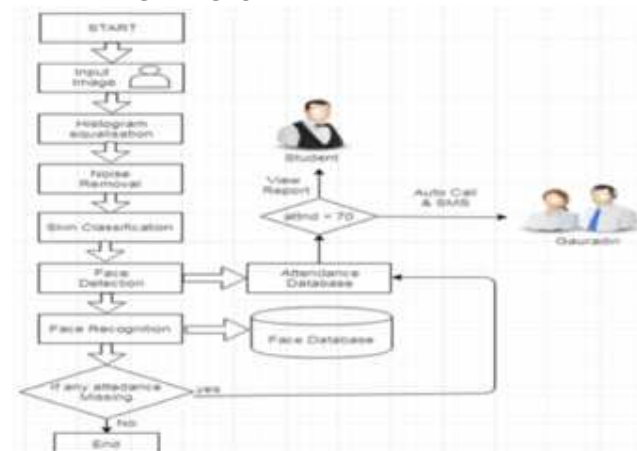
V. ALGORITHM

Viola and jones's algorithm is used as the basis of our design. As we know there is some similarities in all human faces, we used this concept as a haar feature to detect face in image. Algorithm looks for specific haar feature of a face, if these feature found algorithm pass the candidate to the next stage .Here the candidate is not whole image but just a rectangular part of this image known as sub window have a size of 24*24 pixel. With this window algorithm check whole image.

1. Haar Features

As we know there some kind of similarities in human face. We use this concept for making haar feature .They are composed of two or three rectangles. These features are applied on face candidate to find out whether face is present or not. Each haar feature has a value and this can be calculated by taking the area of each rectangle and then adding the result. Using the integral image concept we can easily find out the area of rectangle.
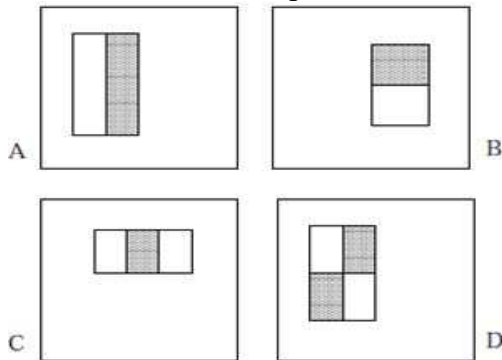
2. Integral Image

The integral image is defined as the summation of the pixel values of the original image. The value atany location (x, y) of the integral image is the sum of the image's pixels above and to the left of location (x, y). Fig. below illustrates the integral image generation.
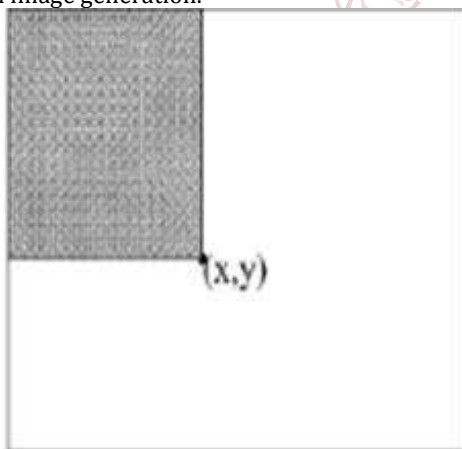

Fig: - Integral image

$$\sum_{x'\leq x, y'\leq y} ii(x, y) = i(x', y')$$

Fast Calculation in Integral Image

Fig. presents the calculation process: in order to calculate the intensity sum of green region. Just four values of F have to be considered. As a consequence, the intensity sum of any rectangular-shaped area can be calculated by considering as few as four values of F. This allows for an extremely fast

calculation of a convolution with one of the rectangular haar feature describe above. The integral image F can be calculated in pre-processing stage prior to detection in a recursive manner in just one pass over the original image I as in equation 2 and 3 below.

$R(x, y) = R(x, y-1) + I(x, y)$ (2)
$F(x, y) = F(x-1, y) + R(x, y)$ (3)

Where R and F are initialized by $R(x, -1) = 0$ and $F(-1, y) = 0$. The sum of intensities of a rectangular are ranging from (x, y) to (x1, y1) can be calculated by considering the values of F at the four cover point of the region instead of summing up the intensities of all pixels inside:

3. Cascade

It is possible to eliminate the false candidate quickly using stage cascading. The cascade eliminates candidate if it not passed the first stage. If it passed than send it to next stage.Which is more complicated than previous one. If a candidate passed all the stage, this means a face is detected.
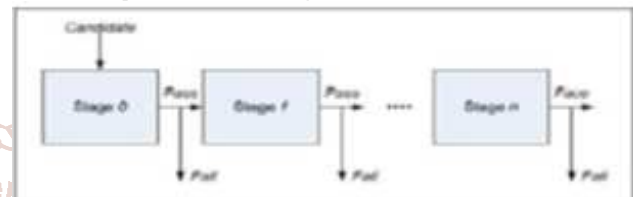

Figure 4. Cascade of stages. Candidate must pass all stages in the cascade to be concluded as a face.

VI. OUTPUT

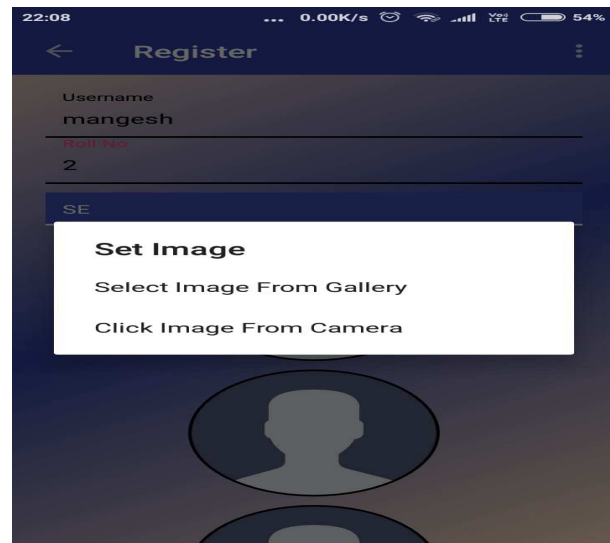Fig: - Face Recognition Welcome page
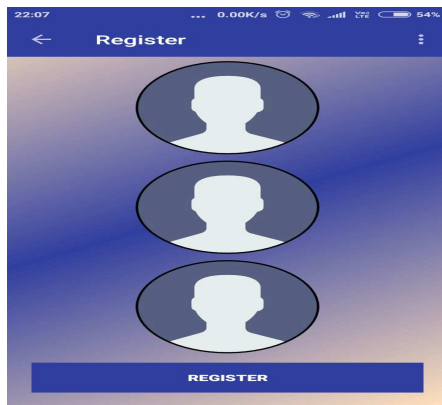

Fig: -Registration
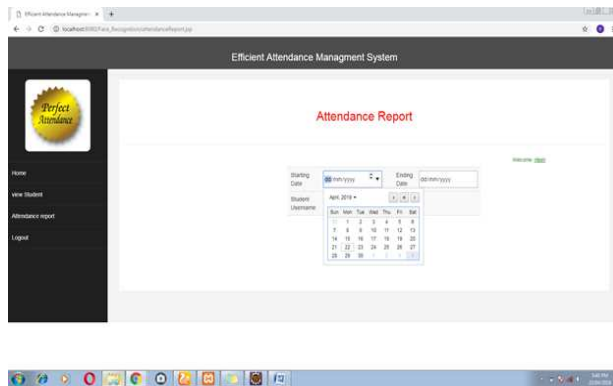
Fig: - Adding Face

Fig: - Attendance Report

VII. CONCLUSION

In order to take care of the attending this method has been projected. It replaces the manual system with an automatic system that is quick, efficient, price and time saving as replaces the stationary material and therefore the paper work. Thence this method is predicted to give desired results and in future can be enforced for logout. Also the efficiency could be improved by integration alternative techniques with it in close to future.

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