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SMART AUTHENTICATION USING FACE RECOGNITION

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Abstract: In this paper, we propose an application that locates the students during classroom lecture. Our application keeps record of In-time and Out-time using face recognition. However, the above feature is difficult to estimate precisely using result of face recognition independently because the face detection rate is not sufficiently high. Here, we put forth a method for estimating the attendance precisely using an android system. The system will contain all the information of student which will be used while comparing with the results of face recognition. The students will be notified about their attendance by Notification system. This system uses cloud for working. Continuous record improves the performance for the estimation of the attendance. We constructed this system based on face recognition for systematic tracking of the students. The result shows that continuous observation improved the performance for the estimation of the attendance.

I. INTRODUCTION

As the necessity for higher levels of security rises, technology is bound to swell to fulfill these needs. Any new creation, enterprise, or development should be uncomplicated and acceptable for end users in order to spread worldwide. This strong demand for user-friendly systems which can secure our assets and protect our privacy without losing our identity in a sea of numbers, grabbed the

ATTENTION AND STUDIES OF SCIENTISTS TOWARD What's called face recognition system.

- Personal identification and access control
- Forensic applications
- Human-computer interaction
- Automated surveillance Cosmetology

Computational models of face recognition, in particular are interesting because they can contribute not only to theoretical insights but also to practical applications. Computers that recognize faces could be applied to variety of problems. The general experimental evaluation of the face expressional system guarantees better face recognition rates. Having examined techniques to cope with expression variation, in future it may be investigated in more depth about the face classification problem and optimal fusion of color and depth information.. The genetic property evolution framework for facial expressional system can be studied to suit the requirement of different security models such as criminal detection, governmental confidential security breaches etc. Even the ability to merely detect faces, as opposed to recognizing them, can be important. Detecting faces in photographs for example is an important problem in automating color film development since the effect of many enhancement and noise detection techniques depends on the picture content (example faces should not be tinted green while perhaps grass should.

The application will contain all the information of student which will be used while comparing with the results of face recognition. The system is widely used in security monitoring, access control and surveillance systems. We constructed this system based on face recognition for systematic tracking of the students. Similar projects have been implemented until now such as Biometric system, Airplane location tracker etc This can be used for:

II. LITERATURE SURVEY

1. Automatic Attendance Management System Using Face Recognition:[1]

In this paper [1], proposed system consists of a high resolution digital camera to monitor the classroom or office room. It is embedded on a micro-controller based motor system which enables it to rotate in left & right directions. The data or images obtained by the camera are sent to a computer programmed system for further analysis. The obtained images are then compared with a set of reference images of each of the employees or students & mark the corresponding attendance. The system also provides for continuous monitoring of the classroom by an operator if needed. The camera module can be a wireless or wired system.

2. Face Recognition-based Lecture Attendance System:[2]

In this paper [2], author has proposed a method that take the attendance using face recognition based on continuous observation. The purpose is to obtain the attendance, positions and images of students' face, which are useful information in the classroom lecture. In this approach, an observation camera with fisheye lens is installed on the ceiling of the classroom and looks down at the student area vertically. ASD estimates students' existence by using the background subtraction and inter-frame subtraction of the images captured by the sensing camera (see Figure 2). In the background subtraction method, noise factors like bags and coats of the students are also detected, and the students are not detected if the color of clothes of them are similar the seats. ASD makes use of the inter-frame subtraction to detect the moving of the students.

3.Face Detection System for Attendance of Class' Students:[3]

In this paper [3], we propose a system that takes the attendance of students for classroom lecture. Our system takes the attendance automatically using face recognition. However, it is difficult to estimate the attendance precisely using each result of face recognition independently because the face detection rate is not sufficiently high. In this paper, we propose a method for estimating the attendance precisely using all the results of face recognition obtained by continuous observation. Continuous observation improves the performance for the estimation of the attendance. We constructed the lecture attendance system based on face recognition, and applied the system to classroom lecture. This paper first review the related works in the field of attendance management and face recognition.

4.Attendance Management System Using Face Recognition:[4]

In this paper [4], the different stages of the hardware design includes skin color detection, morphology, Fast connected-component labeling algorithm, Implementation of the Fast connected-component labeling algorithm, Lip feature extraction, and Horizontal edge detection. Testing:-The Steps of the Experiment Process Are:

1) Initiate capturing the images through the camera which is able to rotate in all direction in the class room.
2) Pre-process the captured images through and extract face image.
3) Calculate the eigen value of the captured face image and compared with that of the existing face images.

4) If the eigen value does not matches with the existing one,save it as a new face image.
5) If the eigen values matches, then the recognition process will start soon.
6) Using PCA algorithm the following steps would be followed
7) Find the face information of matched face image in the database. Attendance Management System using Face Recognition .
8) Update the log table with corresponding face image and system time that makes completion of attendance for an individual students.
9) This section presents the results of the experiments

Analysis: The project we are working on is of Image Processing domain. There are similar projects which are of Image processing domain and used in day to day life.

For e.g: Real-time biometric authentication systems allowing the user to log in by simply looking into a webcam. In this system we detect the authorized user by checking their thumb print. The thumb print is compare with print stored in the database.

The second example is an image organizer or image management application is application software focused on. Authentication is very important parameter in every field. The existing system like Real-time biometric authentication systems focuses on thumb prints. It takes thumb prints for a particular person and stored that in the database. Then after that whenever person uses this system, thumb prints are taken and they compare with the print stored in the database.

Whereas our system focuses on face detection. In this face is captured and stored in the database. &whenever the user uses this system the machine captures the face and the compare with the value in the database.

Software:

Android: Android is a mobile operating system
Developed by Google, based on the Linux kernel and designed primarily for touch screen mobile devices such as smart phones and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on -screen objects, along with a virtual keyboard for text input.

PHP:
PHP is a server-side scripting language designed primarily for web development but is also used as a general-purpose programming language. Originally created by Rasmus Lerdorf in 1994, the PHP reference implementation is now produced by the PHP Development Team and many other teams.

Java Android Programming:
This post is part of a series called Learn Java for Android Development. In this tutorial series, you'll become familiar with Java, the programming language used to develop Android application.

XML:
Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format which is both human-readable and machine-readable.

Wireless Connection:
It will be in use for sharing the confidential detail of person with the device to authenticate the valid person.

Diagrams:
System Diagram:

First of all the student need to share his details using mobile application, then his face will be captured. Further, the current face and one in the database will be compared. If the face matches, then the student will be permitted entry and his In-time will be noted and stored in the database.

Implementation and Result:

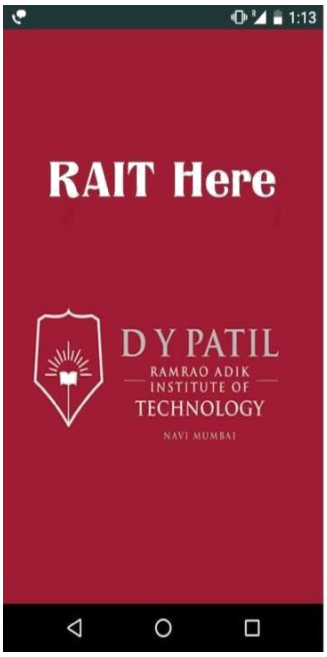
The Smart Authentication using Face Recognition aims at eliminating un-authentic entry into the college premises. Only authorized users will be permitted entry for security purposes. At the main entrance of the Institute, the student need to authenticate himself using his phone and face at the system and hence In-time of the student will be noted. If the student is ABSENT, he'll receive an alert message informing him his schedule for the day and his attendance statistics. The student needs to authenticate himself while entering into each class-room. If he is inside the college and is at unexpected location, he'll get an alert message and need to meet the respective faculty else his attendance for the day will be marked as absent. While leaving the premises Out-time of the user will be noted. At the end of the day, the data of the user will be stored in Database. The database can be monitored using Admin Panel.

Algorithm: Aarhus face recognition algorithm used.
In any triangle, the cosinus law says : c 2 = a 2 + b 2
-2ab cos(γ) So we can also know the value of an angle by changing a bit the equation above : γ = arccos(a 2 + b 2 − c 2 2ab) .This two equations will be useful for us to compute three distances on the face the distance between the two eyes, the distance from mouth to left eye and the distance from mouth to right eye. After we will compute also the value of the three angles of the triangle formed by the three lenghts. In order to detect the two eyes, I used the Region of Interest system. Indeed, we can cut a face in 3 important parts : the forehead (useless in our case), the eyes and the mouth. To track the two eyes, I try to find a dark pixel to detect pupils in the eyes ROI. I run through the resized Bitmap. If a pixel is under RGB(15,15,15), that means it is part of the pupil. If this pixel is in the left part of the resize map, it is the left eye, if it is in the right part, it is the right eye.Now the last part is to track mouth. We take as a reference the first pixel of the resize Bitmap, and we run through the Bitmap and test every pixels to know if it is a different grey pixel (always with the grey range). With this method we try to find two points : the leftmost and the rightmost pixels of the mouth. We calculate after the middle point of those. At the end of the function, like for the eye, we must make

some calculations to have the position of the mouth not in function of the left top corner of the resize Bitmap ,but in function of the left top corner of the original one.

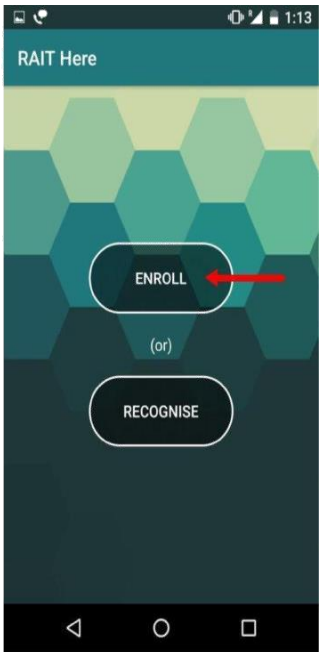
This is the first screen of RAIT HERE app

Fig1



First the user has to enroll himself/herself

Fig2

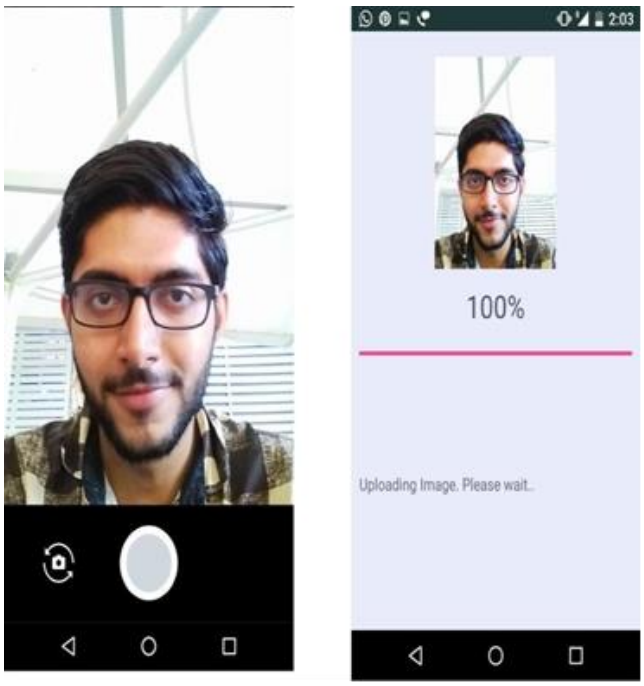


Then user has to fill information regarding personal details as shown below

Fig3

This is the first screen of MARK ME app.

In this fig, user is asked for picture.
Fig4

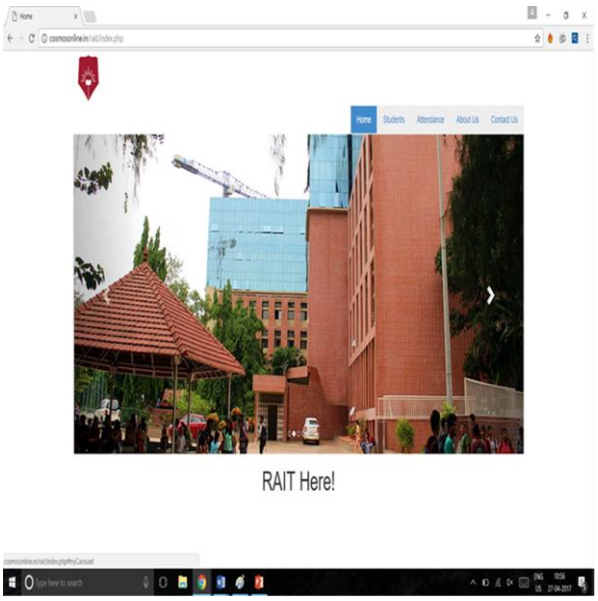


It asks for details entered during enrolling.
Fig5

In fig1 there is another option called recognize.After giving picture to the app, it sends notification to MARK ME app as shown below in right side

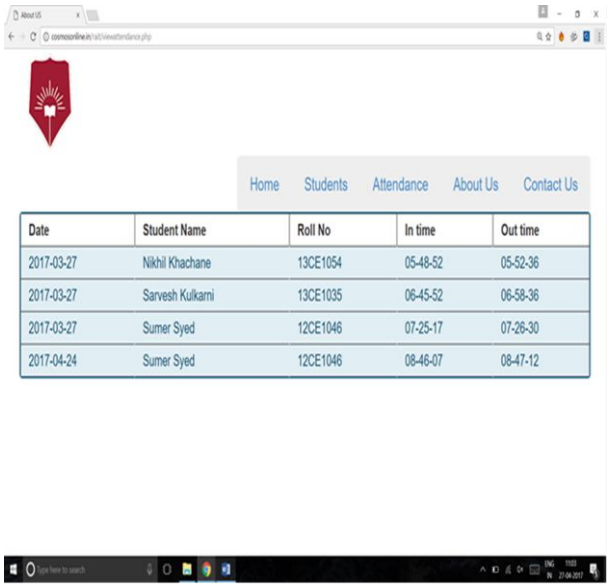
Fig6

This is the admin panel
Fig7



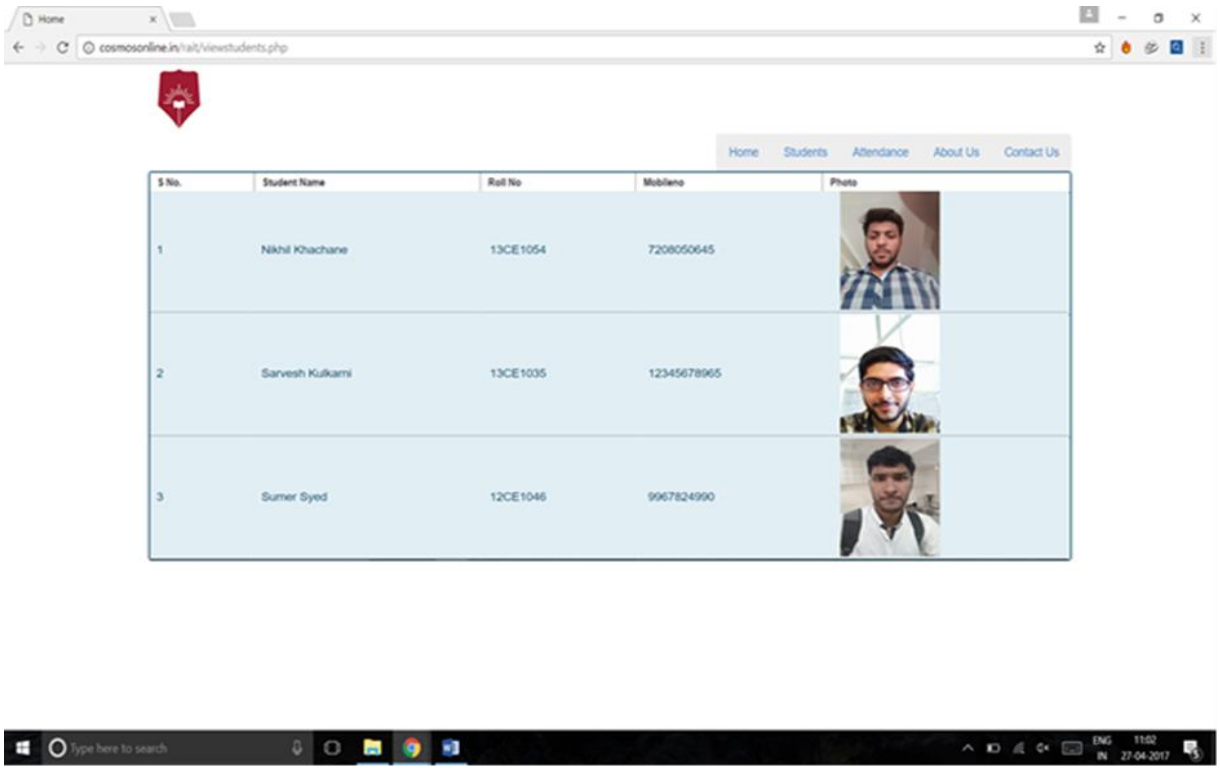
This fig shows how many people are recognized with
Date and In – Out time

Fig8



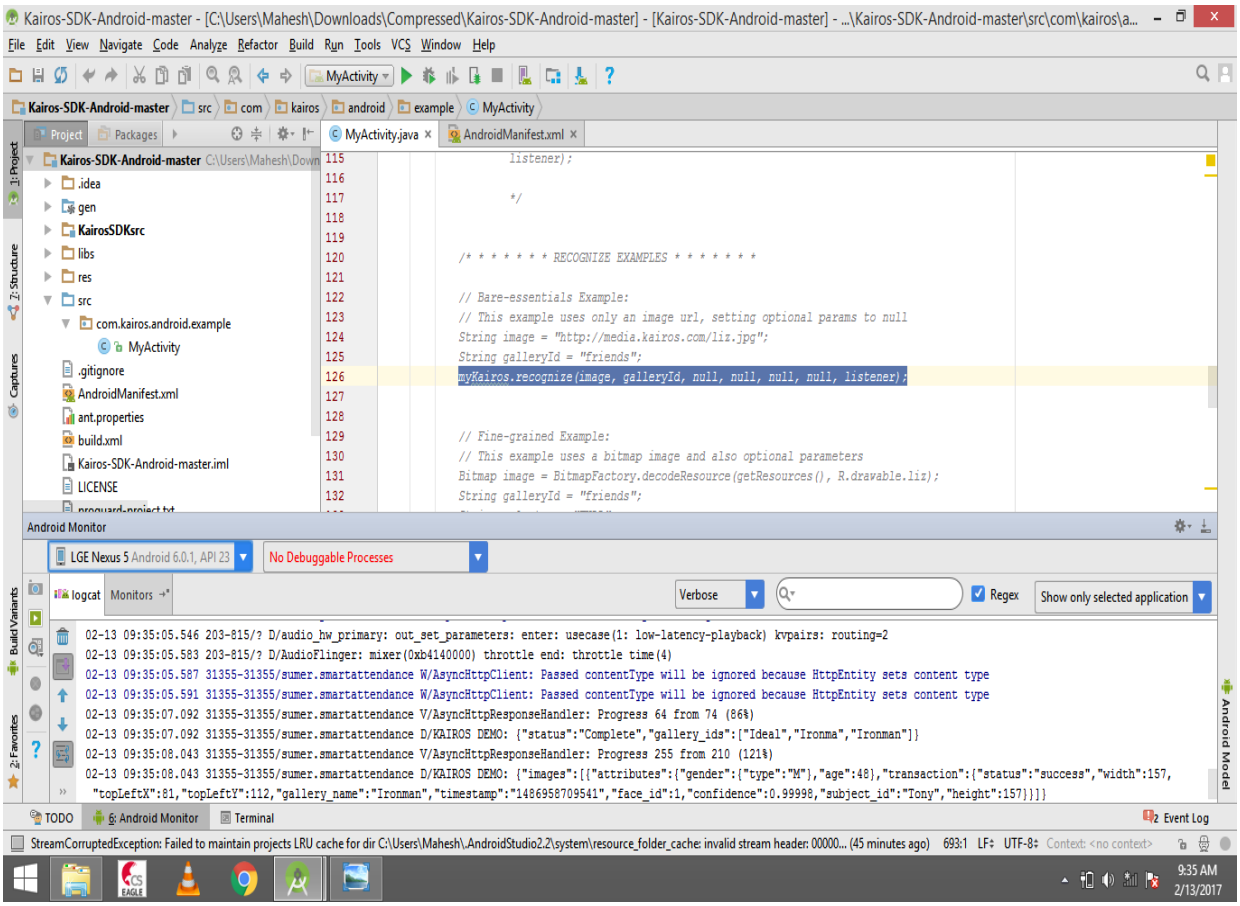
This fig shows how many have registered in the app

Fig9



This is the backend of app and it shows confidence .

Fig10



III. CONCLUSION

Experimental results have shown that, the proposed face recognition method successfully recognized faces in any head orientations. Changes in the illumination did not cause a major problem to the system. Besides, presence of small detail such as dark glasses or masks was too far from being a real challenge to the system. There exists a tradeoff between the correct recognition rate and the threshold value. As the threshold value increases, numbers of misses begin to decrease, possibly resulting in misclassifications. The app successfully recognizes multiple faces the second app is used for notification purpose. It notifies user about their attendance being registered. The app uses cloud technology for notification system.

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