Face Recognition Based Smart Attendance System

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Abstract- Daily participation of the student in the current academic program plays a significant role in measuring success and tracking efficiency. Calling people names or writing on papers are the traditional approaches used in most organizations that are very time consuming and vulnerable. This article describes the automated attendance management method, for convenience or data reliability. The project's key working theory is that, identifying and remembering a particular student. This project is built for attendance at school / college. This framework is based on the technique for camera known as facial recognition system. In the centre of the classroom above the black board facing the students, the camera should be attached. As per the timer set for class timing system. The camera takes the shot from the classroom. And this system plays a key role in the present situation of covid19 as it avoid from person to person contact. Which only captures students face by maintaining certain distance.

Keywords: Facetrack, Smart Attendance, AWS Rekognition, School Attendance

I. INTRODUCTION

Administration of student attendance is a vital element of overseeing school /college /university students. The typical scenario of monitoring student attendance in any other time is by calling out roll numbers of each student. Around the same time, this conventional approach is both inefficient and vulnerable. Maintaining the attendance record is a difficult activity with day to day events. The traditional method of calling each student's name is time-consuming and there's always a risk of being a proxy. The following method is focused on face recognition to hold the student's attendance record. Students' regular attendance is reported as being topic wise that is already recorded by the admin.The device automatically starts taking snaps when the time for the corresponding subject arrives and then applies face detection and recognition technique to the given picture and the recognized students are marked when present and their attendance update with the correct time and Id.

1.1 EXISTING SYSTEM:

Maintaining student attendance in different institutions is the most daunting of activities. Growing institution has its own way of attending such as using attendance sheet or using certain biometric methods. Yet a lot of energy is wasted by these processes. Often student attendance is taken with the aid of the Faculty members' attendance sheet. Which consumes a great deal of time and effort. Whether the authenticated student answers or not we don't know. Consolidated attendance measurement is another important task which can cause manual error. For some other cases some of the students can get lost or removed from the attendance sheet. We need automated attendance management system to solve these troubles.

II. EXISTING RECOGNITION SYSTEMS

2.2.1 Fingerprint Based recognition system:

In the current attendance program based on Fingerprint, a portable fingerprint computer with the student's fingerprint must be installed earlier. The student wants later, during the lecture hours or before register fingerprints on the installed system to ensure their daytime attendance. The problem with this method is that it can distract the students' concentration during lectures time.

Fig.1

2.2.2 The Radio Frequency Identification Based recognition system:

In the new RFID-based system, the student will carry a Radio Frequency Identification Card with them, and place the ID on the usb port to record their day presence. The computer links to RS232 and the attendance is recorded to the saved database. The fraudulent entry may have chances. Some are students can use other student ID to

ensure their attendance when the actual student is inaccessible, or even attempts to abuse it at times.

Fig.2

2.2.3 Iris Based Recognition System:

The student has to stand in front of a camera in the
Iris based student attendance program, and the camera can scan the student's Iris. The scanned iris is aligned with student data stored in the database and the attendance requirements are updated on their presence. That reduces the paper and pen workload of the institute's faculty member. This also decreases the risk of proxies in the classroom, and helps keep student records secure. It is a biometric wireless technique that solves the question of suspicious attendance and the difficulty of placing the subsequent network. But this is also a time consuming process for student for each lecture

Fig.3

III PROBLEM STATEMENT:

In case of Traditional attendance monitoring technique has many drawbacks hence we need to develop a new technology which will reduce the human effort for attendance. In now a day's attendance has to made a important issue and it does impact on the academic record. Hence there should be security as well it should reduce or save the time that spends on taking attendance.

IV OVERVIEW OF PROPOSED SYSTEM

The system proposed is based on the image capture and identifies the faces from that image. Face recognition has held considerable importance over the few previous years and has appreciated as one of the most promising applications in the area of image processing. Face

detection can be considered as a significant part of facial recognition operations.

Based on its ability to concentrate computing energy on the fraction of a face-containing image. Face recognition system in pictures is challenged because of variations across human faces such as skin color tone, voice, position and stance, appearance of glasses or hair, variations in picture gain, climate conditions and picture quality.
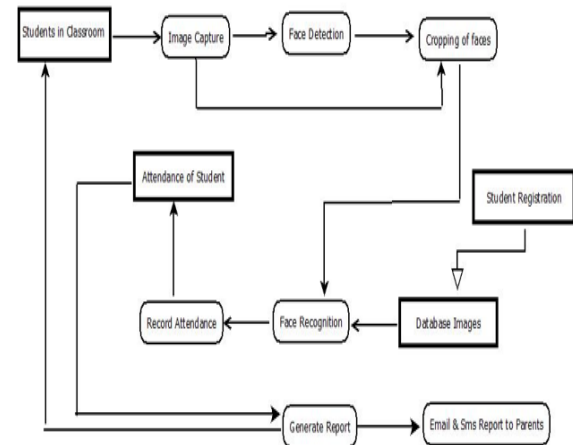

Fig.4   BLOCK DIAGRAM

Advantages

- This attendance management systems ensure accurate time and attendance of student's records
- This accurate data thereby helps to provide accurate performance of the student.
- This system also helps to prevent the present horrible condition such as COVID-19, as several people got affected with person to person contact, hence byusing this system no need to contact with them because image capturing can be done more than one meter distance.

V. METHODOLOGY

We are making use of Amazon Web Services (AWS) in this project. It is a secured platform for cloud computing, providing computing resources, cloud storage, content management, and other features to help companies scale and expand. Store knowledge using maintained databases such as MySQL, PostgreSQL, Oracle or SQL Server.

Amazon Rekognition?
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Amazon Rekognition?
Using proven, highly efficient, deep learning technology that needs no machine learning experience to use, Amazon Rekognition makes it easy to add image and video analysis

to your application. Amazon Rekognition also offers highly accurate facial recognition and facial search tools that you can use to identify and evaluate faces for a wide range of cases of user authentication, counting of people and use of public safety.

The project's key working theory is that, identifying and remembering a single student. Additionally, the student's recognized picture is provided with the attendance, otherwise the program labels the database as absent for the student.

The camera base attendance system is developed for the Schools and colleges. The key objective of this project is to save the time of teachers/Lecturer from taking attendance in each classroom.

The camera is the key device behind implementation of this project. The camera placed in the classroom is facing towards the student. The camera captures the picture three times in an hour.

The picture contains Multiple faces of student present in the classroom.

We sent the picture to the AWS recognition service. This AWS Rekognition service does 3 operations

1) Face/object Detection
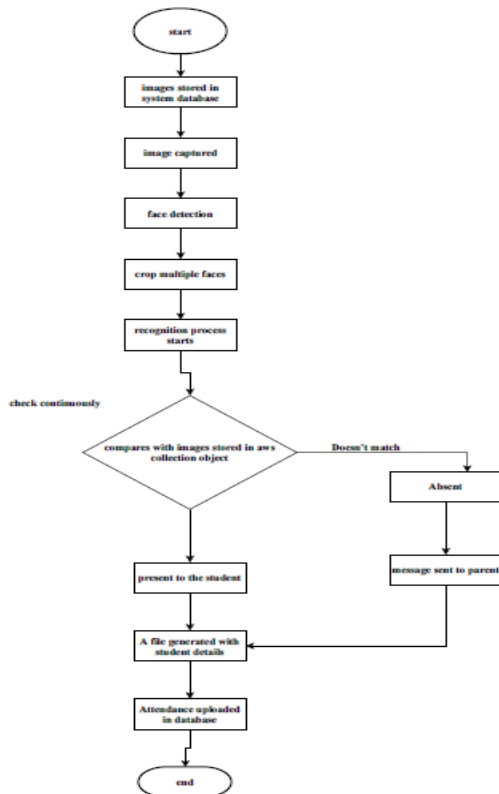
2) Face rekognition

3) Face comparison.

Fig.5 FLOW CHART

FACE/OBJECT DETECTION:

The camera is kept inside a classroom at a specific distance to take images of the entire class. Face Detection is the process in which the image is scanned for any face in the class, given as an input (picture), once the face is detected, the image processing cleans up to the face picture for better face recognition.
The identity, location, size and (possibly) direction of any face depicted in a still image or video frame are determined by a face detection system. This device is designed to detect faces, irrespective of features such as age,sex and facial hair.

A face evaluation program takes a face picture and determines whether the face matches similar faces in a given database. Amazon Rekognition shows a bounding box, features, attitudes, landmarks, appearance, and pose in each face it detects. Every feature or expression has a score of value and confidence.

FACE RECOGNITION:

The multiple faces from the image gets detected and cropped in a local folder. and once the faces are cropped it compares with the faces stored in AWS Collection Object.

Fig.6

FACE COMPARISION

These faces will get compared with the facial features stored in the AWS collection object. If the image is matched with the collection image then it will return External Image ID and face ID. This external image Id is mapped with the roll in the Local Database (i.e. Microsoft Sql Server). This data can be maintained in such an Excel sheet. The Excel sheet can be kept weekly or monthly to document the attendance of the students. This attendance can be sent to student's parents or guardians to monitor the student's results.
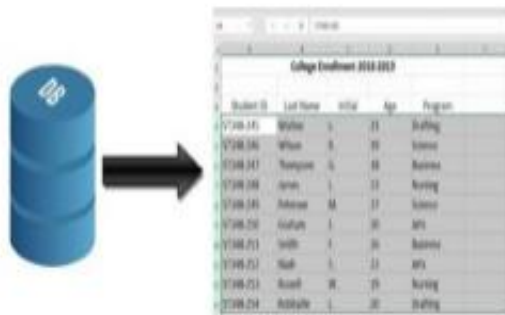
Fig.7

VI. IMPLEMENTATION AND RESULTS

In implementation we are using following modules

6.1 Modules

This project mainly consists of three modules

1. Admin Module

2. Student Module

3. Report Generation

4. Communication

Admin Module:

Admin module consists of two pages

1)Admin Page.

2)Student Registration.

1)Admin Page:

From the administration page we can create, update, delete the AWS Collection Object. once the collection is created then the admin can upload the photo of the student along with the external image id trough the Amazon web service.

2)Student Registration.

The student registration page is responsible for the registration of the student. The following fields needs to be entered for the registration of student like first name, middle name, last name, mobile no, email id and class.

Student Module

This module consists of student Attendance page which is responsible to mark the student attendance page. once student Attendance page is loaded. It enables the camera as well as timer. Once the timer is enabled then it will run the following sequence of activity

> The camera captures the images in the timer tick event.
> The faces in that image get cropped and stored in the local test folder.
> Each face gets compared with the featured extracted and stored in the AWS Collection.

> The matching faces gives the external image id. Face id and unique Image ID
> The external image id is verified with the local database and the attendance is marked along with the timestamp

Report Generation

> Once the attendance is marked, we can generate the reports on roll number wise, class wise, daily, monthly report
> The roll number wise and classroom wise reports

Communication

The parents would be acknowledged about the involvement of the student in the classroom. The response is immediately sent off to email Id for parents.
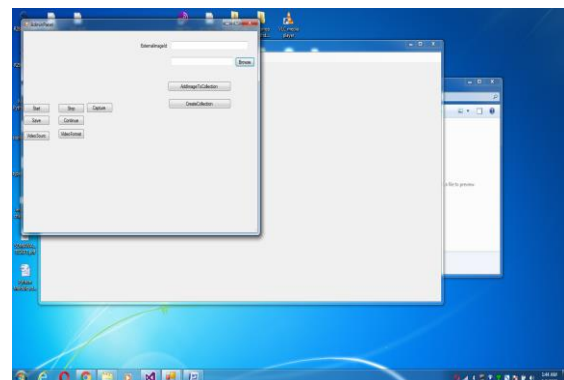
VII. RESULTS

1. ADMIN PAGE

Fig.8
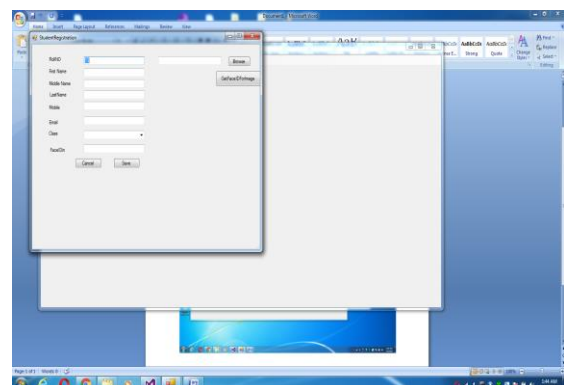
2. STUDENT REGISTARTION

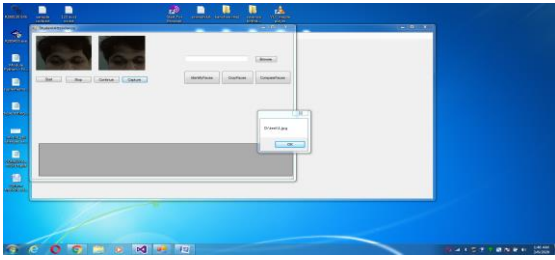

Fig.9

3. IMAGE CAPTURING

Fig.10

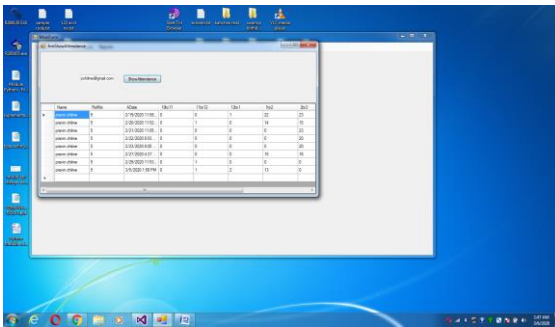## 4. COMPARING WITH STUDENT DETAILS

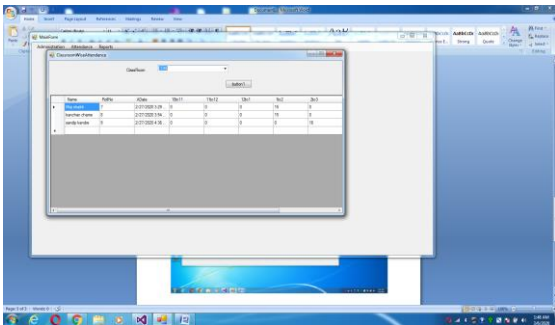
Fig.11

5. STUDENTS REPORT MAINTAINENCE
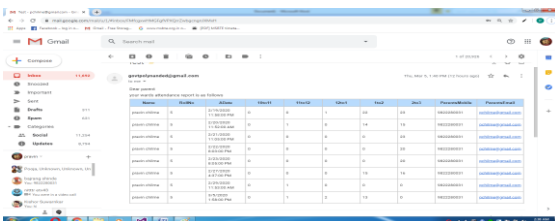

Fig.12

6. SENDING REPORT THROUGH MAIL

Fig.13

VIII. CONCLUSION

Hence, the main aim of this paper is to catch the picture of the student to see their participation or absence, to mark the attendance of a specific student to track the record. The Automated Classroom Attendance Program helps boost the accuracy and speed to achieve real-time high precision attendance to fulfil the automated classroom evaluation requirement.

IX. FUTURE ENHANCEMENTS:

- Automated attendance system can be used in broader settings, such as a lecture hall, where there are many people.
- Perhaps the poor lighting condition of the classroom can influence image quality which eventually degrades device. performance, this can be resolved through the latter step by improving picture quality and using the other algorithms.

REFERENCES

[1]. N.Sudhakar Reddy, M.V.Sumanth, S.Suresh Babu, "A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques",Journal of Emerging Technologies and Innovative Research (JETIR), Volume 5, Issue 12, Dec 2018.

[2]. Dan Wang, Rong Fu, Zuying Luo, "Classroom Attendance Auto-management Based on Deep Learning",Advances in Social Science, Education and Humanities Research, volume 123,ICESAME 2017.

[3]. Akshara Jadhav, Akshay Jadhav, Tushar Ladhe, Krishna Yeolekar, "Automated Attendance System Using Face Recognition", International Research Journal of Engineering and Technology (IRJET), Volume 4, Issue 1, Jan 2017.

[4]. B Prabhavathi, V Tanuja, V Madhu Viswanatham and M Rajashekhara Babu, "A smart technique for attendance system to recognize faces through parallelism", IOP Conf. Series: Materials Science and Engineering 263, 2017.

[5]. Prajakta Lad, Sonali More, Simran Parkhe, Priyanka Nikam, Dipalee Chaudhari, " Student Attendance System Using Iris Detection", IJARIIE-ISSN(O)-2395-4396, Vol-3 Issue-2 2017.

[6]. Samuel Lukas, Aditya Rama Mitra, Ririn Ikana Desanti, Dion Krisnadi, "Student Attendance System in Classroom Using Face Recognition Technique", Conference Paper DOI: 10.1109/ICTC.2016.7763360, Oct 2016