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PC Vision Based Unpretentious Classroom Attendance Tracing Framework/Technique (MAY 2021)

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Article History	Abstract
	Fossil classroom environment follows a manual attendance marking system either by calling the student's names it interrupts the teaching procedure and also takes a lot of time. It can also lead to factors like a proxy. To overcome this issue, we have introduced a high-definition camera that will be installed in every classroom which captures the student images from all angles.

1. Introduction

This In an old classroom taking student's attendance was one of the important things to know about a student's education progress.The staff may encounter trouble in both endorsing and keeping up each understudy's record in a study hall constantly.the attendance of a particular person can be taken by a third party without the realization of the institution which violates the accuracy of the data [2].

This system makes efficient use of hardware and software principles and also features connectivity using IoT. There are two types of taking attendance one is Manual and the other is automated. We do have much-automated attendance taking system for example by using RFID, Fingerprint but the drawback is that the student has to stand in front of the sensor to detect the face, and it only captures when the student is directly looking at the camera which is a drawback but our proposed system camera focus on every angel of the students face while the teacher is just explaining and the images are been sent to the database and stores it for the entire course for that teacher.The final product is a framework that distinguishes the understudies, keeps an online participation register as an information base, and gives the educators a point-by-point participation record of any understudy, on request. The methodology used in thispaper is:

- A high-definition rotating camera is installed in every classroom and the front view of the camera covers 70-80% of the entire classroom. For the

- remaining 20% to 30% the camera has to turn around.

- If a class is for 1 hour the camera sends 6 images or frames to the database i.e for every 10 minutes the

- camera captures the frames which contain the student's face from different angles.

Literature Survey

As stated in the previous section, this paper proposes a system that is an automated attendance management system.

In recent years, many works have been published which tackled the problem of taking attendance manually.

The first paper talks about the Proposed modified HOG, face detection technique by incorporating Max-Margin Object Detection (MMOD) as Max margin face detection (MMFD)[1].In their project later there will be 2 concerns first one is the selection of a feature that has high power, the second one is dealing with the learning process[1].

The second paper talks about the "Real-time Attendance management system" in which the cameras are installed outside the classroom and the students have to scan their face before entering the class and the 2nd camera will be installed inside the classroom. Facial detection and recognition algorithms will be applied to both the cameras to analyze the faces and mark their attendance accordingly [2].

The third paper talks about the "Attendance management system" but with 2 hardware devices is a handheld and local server. This proposed system uses Rasberry pi as the local server. Admin will give the IDs and passwords to the members of the school/college with less number of required viewing. Students will be able to only view the attendance where the teachers will be able to view and mark attendance and the Head of the school/college will be able to see the full attendance system [3].

The fourth paper talks about "Portable Biometric Attendance using IOT".In this paper, the proposed system is a portable machine where the students can just scan their fingers from and the attendance will be updated according to it. A small size factor and being portable. We know that the device is portable and it needs to be charged its necessary to have a battery and charger point since the battery will get drained while using it [4].

The fifth paper talks about "Student Attendance Management System with Bluetooth Low Energy Beacon and Android Devices" in which the attendance can be taken from students' smartphone but to avoid proxy by students who get outside the classroom they came up with a magical number which is transmitted by BLE beacon so that the students inside the classroom get it and it even avoids proxy [7].

The sixth paper talks about "Attendance Management System using a Mobile Device and a Web Application" where when the class is going on ta mobile will be passed in which the student should select his/her name and confirm the name and the id and the student should take a picture upload it and later sign on that application [8].

Proposed System

It comprises of a turning superior quality camera set in the classroom to catch every one of the students. From these caught picture outlines, the understudies' appearances are distinguished utilizing the Maxmargin face location strategy. Face acknowledgment is performed utilizing prepared Inception-V3 model and contrasted and a data set of understudies' pictures which is as of now made during the understudy enlistment measure by requiring the 1-2 minutes' video with all conceivable presented faces. Fruitful acknowledgment creates a dominant sheet with the understudy's name, move number, separate trimmed faces alongside time-stamp which is saved in the data set.
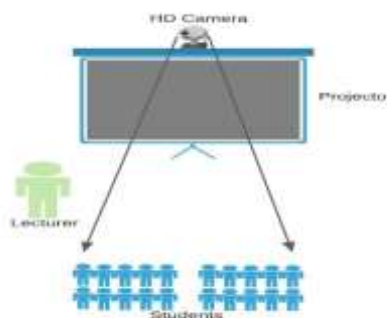

Fig.1.Architecture

It contains a block outline of face recognition attendance system The process of identifying a person's face is based on 3 phases

- registration and normalization
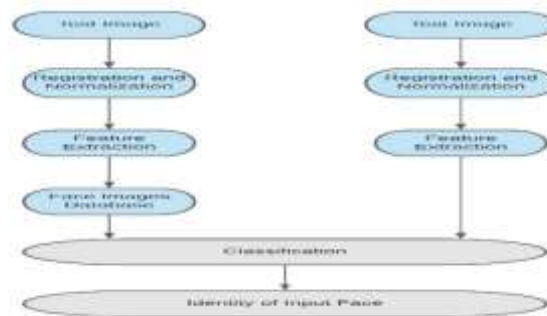- feature extraction
- classification

Fig.2.Block outline of face recognition

REGISTRATION AND NORMALIZATION

In this phase, the image is changed till it is the same as the dataset image ex: check if the eyes are in the same position, and so on. Normalization is a cycle that changes the scope of pixel power values.

Normalization is also called histogram stretching

FEATURE EXTRACTION

In feature extraction, the distinctive properties of the face image are extracted. The images may be represented by their original representation.

EXTRACTION

Classification is used to compare the detected face with the student's dataset and when it is matched the attendance will be provided to that particular student. In this proposed system we have used the Haar feature-based for classification which is used to detect objects in images.
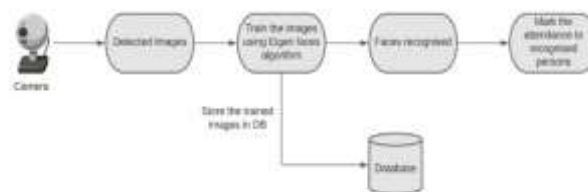

Fig.3.Activity diagram
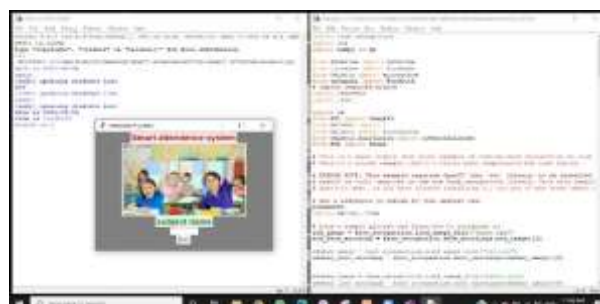
Experimental Results

Fig.4.Capturing face

In fig.4. The camera captures the images of the student from a straight angle to check if the student's image is captured properly or not.

Fig.5.Saved images

In fig.5. The images of the students are from different angles and are saved and will be sent to check with the student database if it matches.

Fig.6.Checking

In fig.6. Using the max-margin technique we check whether the captured image and the student database image is the same if it is same then the attendance will be marked for that particular student.

Application

This work can be used in schools and colleges to reduce the time taken for manual attendance and avoid factors like proxy, etc and it is easy to build and save a lot of time, and the class won't be interrupted.

4. Conclusion

It To overcome the limitations of the fossil attendance management system we proposed a Computer Vision-based Unobtrusive Classroom Attendance Management System (CVUCAMS) Which is an automatic attendance management system which uses the technique like max-margin and detects the faces of the students and it is 97.6% accurate. The proposed system detects the student's faces from all the sides variation. The improvement less computation GPU it should work Utilizing this framework participation of the understudies will be naturally refreshed on the website page which we have made by utilizing face identification and face acknowledgment methods, just as per the prerequisite of the framework picture standardization is likewise finished with the assistance of Raspberry-pi and Open Cv programming.

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