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FACE RECOGNIZATION ATTENDANCE SYSTEMUSING MACHINE LEARNING TECHNIQUES

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***Abstract*— Nowadays education institutions are concerned with the regularity of student attendance who is present or absent. This is mainly concerned with the student's academic performance which is affected by his or her attendance in the Institution. The methods of calling the attendance which by calling the student roll no, or by calling the name or by making the sign of the student in the paper. These may take more time and also be difficult for faculty. So, there is a necessity computer-based attendance system in which it maintains the student attendance record. Attendance is easy by re-recognization of students and marking attendance. The proposed system was designed by using CNN classifier and LBPH algorithms for face recognization. This system saves time for marking attendance.**

***Keywords*— Face-Recognization; Face-Detection; LBPH (Local Binary Pattern Histogram); Attendance system**

I. INTRODUCTION

Attendance is very important in every school and college. It is very difficult to mark the attendance of the student by calling out each student's name. It nearly takes 5 to 10 minutes in each session. Many students may get proxy attendance if the teacher did not notice. And the teacher may miss out on any names of the student by calling attendance. So, many institutions started developing many techniques like fingerprint attendance system, Iris recognizes, on and so on [3]. This may contain more time.

Face recognization is one of the important biometric features where it recognizes the face of the student marks the attendance. Recognization-based systems are relatively unaware of various expression sessions. It mainly consists of two types: verification and face identification. It matches the face in the database while taking the attendance it checks the identification which is earlier stored in the database and marks the attendance.

The main purpose is to build the attendance of the student by face recognization. In the face of the individual is considered for marking the attendance so that the student should get registered first and the data should be stored in the database.

Nowadays face recognization is widely used and it is gaining main popularity. The proposed system detects the face of the student and marks the attendance if the detected face is found in the database. This consumes less time compared to other technical methods.

II. LITERATURESURVEY

The detection and identification of students faced explained-time face recognization which tracks the student face of the individuals. The main purpose is to analyse the attendance based on the student's face and marks present or absent of the student. After capturing the face of the student and mark the attendance and send it's to the database. This system is accurate that provides any of the fake attendance.[1]

To know that the student is attending the particular course, which contains the information which was generated and displayed in front of the classroom. The student who attends a particular course has to capture his or her facial image. The image facial matches his or her face will generate the attendance present to that particular course. [2]

The attendance system based on another n face will detect the face of the students and its trained image set. The camera is fixed to capture the student's face and submits the images then process the individual faces and mark the attendance of that particular student and store it in the database.[3]

The picture-based attendance system captures the face of the student. It should be fast and should be accurate to get

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students' to face. The process will include the registration of the student by capturing the image and after that training the image. After trained it is stored in the database. While taking the attendance it sees whether the image matches with the images to red in the database and marks the attendance in which faculty can view how many students are present.[4]
It is very difficult to mark the attendance by calling the roll no or names of the student. It takes more time and some students' names may be missed out while calling or some may not answer or some students may get proxy.So, to avoid this educational institutes may use a face recognization attendance system in which by considering the student's face they can mark their attendance. [5]

III. METHODOLOGY

The face is like a typical multidimensional and provides good vision analysis for recognization. These biometric methods are used for a very long time. It is completely reliable but still not completely to detect a person. Face recognization attendance system consists of 4 stages namely:

- Image acquisition
- Face detection
- Feature extraction
- Face recognization

1. Image Acquisition-It is the action of retrieving an image from a source, like hardware sensors such as cameras, sensors. The image acquired by the system is not completely processed. It can be achieved by suitable cameras, the use of different cameras in different applications. The process of sensing an image is called image acquisition.

2. Face detection-Face detection is the process of capturing the image of a student. It is the detection process of an image in which the image of a person is matched bit by bit. The image should match with the images that are stored in the database. Any changes in the facial expression will invalidate the matching process.

3. Feature Extraction-Feature extraction is the process in which the initial set of raw data is reduced into manageable groups. So, it is easy to process. The important characteristics of large files are that it contains large datasets and it requires a computing resource to process. In a face-based attendance system

4. Face-Recognization-It is matching a student face that is stored in the database. Typically, students authenticate users through ID verification services, which works by measuring features from a given image that is stored in the database.

Design Issues**:**

- Only the center of the face is detected in which side faces are not detected while registering and also while taking the attendance.
- A large dataset and solid computing power are required for the training structure to become deep increasing.
- Large memory is requested for training and testing both need time consumption. These large memories demand complexities which make deep learning which is not suitable for learning.
- Considerable skills are required to select suitable parameters like learning rates and the number of layers.
- These large parameters have internal dependencies that make them particularly expensive.

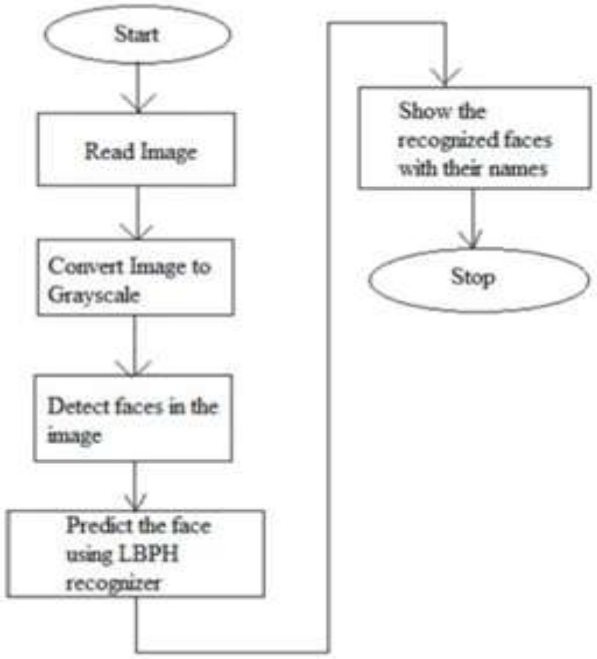


Fig1: Flowchart of the methodology

Before the attendance system work, the system must contain the basic information which is student's enrolment and name. The first procedure is to take the image of a student that is done by the camera, if the camera doesn't capture the image properly, it asks to retake the image, the images undergo several pre-process in steps and the gadgets trained. Then those images are stored in the database.

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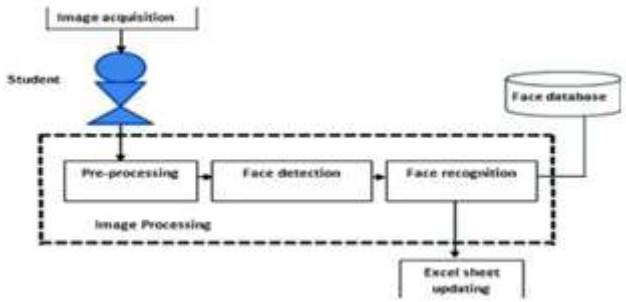


Fig 2: Design of the face recognization attendance system

In fig 2, the student, must come and stand near the camera to get the attendance for the particular subject. After capturing a student image, the image is pre-processed after that it detects the face of the student and recognizes the face of the student while marking the attendance. If it matches the image that is stored in the database the student gets the attendance that will update in the excel sheet.

Algorithms

The algorithms used in the system are CNN and LBPH. Applications like face recognization and image compression use these algorithms. LBPH-Local Binary Patterns are used to extract some of the local features of the images that are stored in the database. It works by dividing the face of the image into several blocks that label the pixels of an image of every pixel and consider the result of that by a binary number.

The main features of the LBPH algorithm:

1. It is largely used in authentication, criminal investigation, robot intelligence, and mutual science.
2. LBPH Algorithm not only uses the front face but also recognizes the more flexible side face.

Limitations of LBPH algorithm:

The recognization rate of LBPH can be reduced under illumination, expression, large, and attitude detection.
The CNN-Each batch consists of n number of images and CNN filters are updated to those batches. CNN is used for image processing. CNN has become the main method in face recognization systems. To deal with human face recognization on a small original dataset, a new approach is combined with an argument dataset which is called CNN.

IV. IMPLEMENTATION

At first, the student should register him/her by name and enrolment. Then the student should take an image after that the images should be trained so that the image of the student can easily match the image while taking attendance.

1. At first the student should stand near the camera and should take the snapshot to mark attendance.
2. Snap shot images perform some of the operations like binary, binary to gray, and gray to RGB.
3. On the based one features the images are matched with stored images in the database of the system.
4. If the database image matches the captured image of the student the future process or operation will be done.
5. If the image of the student matches with the stored image of the student present or absent will be counted.
6. If the student is an absent teacher can easily find out because no proxy or any mistake canbe done.

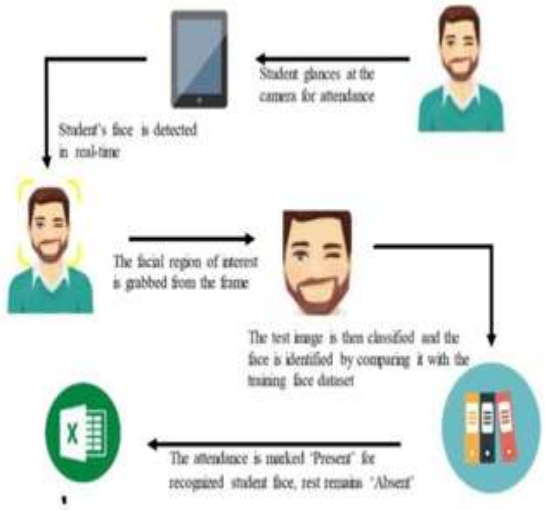


Fig 3: working of face recognization attendance Snapshots



Fig 4: Student registration

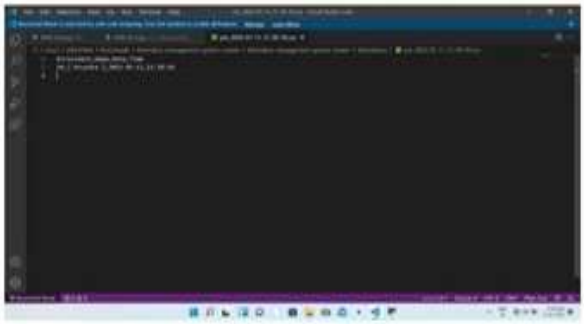
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Fig 5: Storing data to database



Fig 6: Attendance taking


Fig7: Attendance stored

V. RESULT AND DISCUSSION

It is very difficult to mark the attendance by calling the roll no or names of the student. It takes more time and some students' names may be missed out while calling or some may not answer or some students may get proxy. So, to avoid this educational institutes may use a face recognization attendance system in which by considering the student's face they can mark their attendance. First, they have to register themselves by entering roll no and name and should take the image and those images should be trained a stored or in the database. Then the students can easily take their attendance while entering the class if the image matches the image in the stored database, then the student will get the attendance and the attendance will be stored in the excel sheet.

VI. CONCLUSION

A face-based attendance system is ensured to mark the attendance of the student. It is simple, time-saving which eliminates the stationary material and pen and paper. We can say that it is safe, stable, and efficient for maintaining the attendance system of the class which was developed to replace the manual marking of the attendance. The face recognization system saves the time of the faculty and reduces the work of the faculty. These were developed to reduce the error and mark proxy attendance for a student. This can replace the old manual methods and it is stable accurate and easily used. It can be designed using a computer system. The accuracy by which the system approach is about 00% for high-quality images, 92% for low-quality images.

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