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Automatic Attendance Generating System Using Artificial Intelligence Technique

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ABSTRACT

The conventional methods practiced in most of the institutions are by calling names or signing on logbooks which are highly time consuming and insecure. This system describes the working of an automatic attendance system in a classroom, institution environment. If the system recognizes faces, body, and eye pattern, the attendance gets marked immediately on the worksheet. In this AI based face recognition system, the face is the identity of a person. The methods to exploit this physical feature have seen a Great change since the advent of image processing techniques. Counting people in visual surveillance is hard and challenging problem. Previously many techniques are proposed but due to the complexity and accuracy reduction, we planned to implement with AI based automatic attendance tracking system using AI image processing. This paper describes the working of an Automatic Attendance System in a Classroom environment. Initially video clip of classroom is taken and is stored in the Database, and these Video is converted to frames/images, then we apply face detection Techniques such as Ada-boost algorithm and which are extracted by Histogram of Gradients (HOG) and Local Binary Pattern (LBP) algorithm. Here, we are getting to build the human counting system through webcam, a smart attendance monitoring system based on face recognition will generate the attendance. This Technology stands tall with its unique advantages.

Keywords:—*Web camera, face recognition, AI, Attendance monitoring, image processing.*

INTRODUCTION

Artificial intelligence approach is the computer system based simulation of human intelligence process by machines. Specific applications of AI includes natural languages processing speech recognition and computer vision. A Smart attendance monitoring system with face recognition, eye pattern and body structure based .There are various software's or technologies are so advanced that even blurred images are sometimes rendered enough and investigated to know the personality of the individual. Facial recognition technology is

a framework or software which is capable enough to verify the identity of an individual by analysing a picture or footage. In order to obtain better performance, the test images and training images of this work is limited to frontal and upright facial images which consists of single face only. The training images set is taken from neural network model to ensure no quality difference or if possible, the person having the rights to access the database and they can also add the images of high quality image, which is captured from high quality camera and later on add that image to the database, but as I have mentioned only the administrator or the person having the rights to access database can only enrol or remove the students or faculty data from it .In addition, the students have to register in the database to be recognised. The registration can be done by the IT cell from the admission office. Especially computer system. Specific applications of AI include expert systems, Natural languages processing speech recognition and machine vision. The attendance is taken in Every schools, colleges and library.

II. LITERATURE SURVEY

This literature survey analysis the digital attendance tracking system in various data analytical methods. These System installed the camera with non-intrusive, which can snap images in the classroom and compared the extracted face from the image of the camera capturing with faces inside the system. This system also used machine learning algorithm which are usually used in computer vision. But in this, Project we work on Har Cascade classifier which used to extra the features of faces. Here the object detection technique will initially identify the facial object by shape and the model created by training databased, which is available at the Open CV. These models includes eyes detection, face detection etc.The main purpose is the features on the image makes it easy to find out the edges or the lines in the image. The HAR feature continuously traverses from the top left of the image to the bottom right to search for the particular feature that mean sedges traversing. The advantage of the edges feature-based approaches is to integrate the structural information by grouping pixels of face edge map to line segments. After comparing those pixel calculations and done the further process.

III. EXISTING WORK

Currently student attendance marking technique is often facing a lots issues and a very slow process. Teacher's or faculty calling names of student from their data sheet and student responding to them. But this existing process becomes very complex in large classes that consists so many students. Many times, students also mark proxies by responding to fake name. This makes disturbance in class and distracts the students during the exam time. Also, verifying the total students present by counting them after attendance, which takes a lot of time consuming. Apart from calling names attendance sheet is passed around classroom during lectures especially the classes consisting large number of students might find it hard to have attendance sheet being passed around the class.

Douglas Ahlers Bernie Di Dario, Michael Dobson, in 2006 gave the concept of attendance tracking system. This framework consists of identity tags, with wireless communication capabilities, for each attendance and the scanners for detecting the attendee's tags as they enter in that allocated room. O.A. Idowu and O. Shoewn Development of Attendance Management System by using Biometrics. Attendance is taken with the help of a finger print device and the records of attendance are stored in the database. Attendance is marked after successful identification. Manual

maintenance of attendance inefficient due to the following reasons. It takes away a lot of lecture hours Prone to proxies or impersonations to resolve this problem attendance, many attendance management systems have been introduced in recent years. Best face selection method using face quality assessment and robust face representation using deep convolution network. Portable device based on embedded systems for attendance in classroom and institution.

3.1 Drawback

Image Quality:

The resolution of the reference picture plays a significant part in the identification process. If the resolution of any picture is not high or, then it can cause cameras to be tricked into believing that the person being scanned is not the same as in the photo. A simple arrangement for this issue is to ensure that both the reference pictures and scanning are performed by same cameras.

Produces data vulnerabilities

There is concern about the storage of facial recognition data, as these data sets can possibly be penetrated or breached.

Performance may vary from system to system.

This framework requires fast and good quality of processor for smooth and lag free execution of program. Low configuration PC or devices might face lag issues or might face slow data processing.

Technology might be fooled. (In rare case).

Some variables might affect this framework's ability to recognize individuals' appearances, including camera angles, lighting levels and picture or video quality. Individuals wearing masks or slightly changing their appearance can throw off facial recognition technology too. But there is very rare probability for occurrence of this issue.

3.2 Algorithm

Step 1: Load the image data

Step 2: Pre-processing stage

Step 3: Object detection process

Step 4: Feature analysis

Step 5: Face recognition

Step 6: Support Vector Machine Learning

Step 7: Result detection

IV. PROPOSED METHODOLOGY

An automated attendance system is developed using web cam utility based AI approach, which consists of image capturing element, face, body, eye detection, database development, pre-processing, feature extraction, post-processing stages. Blocking process of proposed work is given in Figure 1.

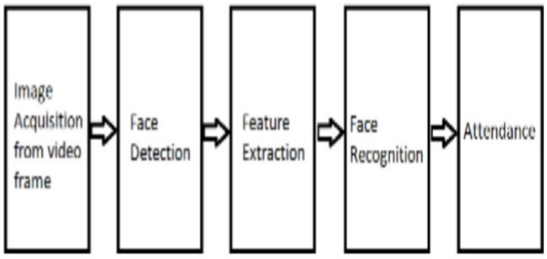

Figure 1: Block Diagram of proposed system

To develop the smart attendance management system, some steps are required to be followed. The steps can be defined in the following ways:

- Face Detection
- Enrolment
- Face Recognition
- Attendance Marking

4.1 Face Detection:

For better accuracy of face-log generation, we employed face tracking technique. All we did was first detect the focusing Viola & Jones idea and then, we used the correlation tracker from the library to keep track of the face from frame to frame. This approach also saves computational power since we don't have to detect the face after transforming to a new frame in the real-time video sequence. This helps to generate a face-log a concise representation of the face of the subject in a video sequence

4.2 Enrolment:

In this step, the enrolment of the student details is done as set of student database. The student details include the Student ID, name of the student, register number, department and year, student's academic details, status of the student whether the student is present or absent. The enrolment of the student also includes the image of the student and is stored by detecting the face of a student at the time of his/her enrolment.

4.3 Face recognition:

To implement the facial recognition, we will make use of the Local Binary Patterns (LBP). Local Binary Patterns algorithm is based on local binary operator. It is widely used in facial recognition due to its computational simplicity and discriminative power. The basic idea is to summarize the local structure in an image by comparing each pixel with its neighbourhood.

The steps involved to achieve this are:

- Feature extraction
- Classification

4.4 Attendance marking:

When the face of the student is recognized by the system, and if that matches with the image in the database, that particular student is marked as present. If that doesn't match with the image, then the student attendance status remains absent. Face recognition system is shown in Figure 2.

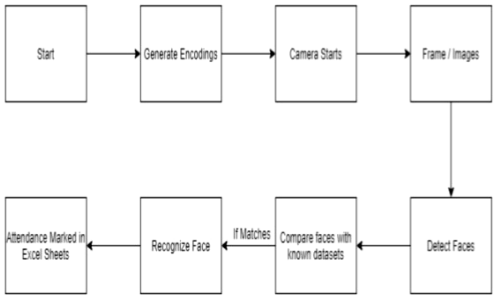

Figure 2. Face recognition system

"Attendance Management System" is software developed model for maintaining the attendance of the student on the daily basis in the collage. Here the staffs, who are handling the subjects, will be responsible to mark the attendance of the students. Each staff will be given with a separate username and password based on the subject they handle. An accurate report based on the student attendance is generated here. This system will also help in evaluating attendance eligibility criteria of a student. Report of the student's attendance on weekly and monthly basis is generated. To make the attendance marking and management system efficient, time saving, simple and easy. To reduce the time that is consumed when attendance is taken manually. To design and implement an automated system that will record student class attendance. Attendance management system keeps track of daily attendance, working hours, breaks, login, and logout time. It prevents staff's time theft.

An attendance management system integrates all attendance devices such as smart cards, biometric, and facial

recognition devices in real-time. To store, access and manage student attendance data for every lecture and lab classes. All the student attendance data will be stored and managed through Student Attendance Management System. This system enables lecturer to add, view, make changes or delete on subjects, classes, students and attendance accordingly. Moreover, saving attendance records into the system will be more secured as compared to paper-based records. To automatically calculate number of absences and the percentage of present of the students based on subjects with respective lecture and lab classes. Student Attendance Management System enhances calculation process to be more accurate. This system by default will do the analysis, which are counting the number of absences and calculate the percentage of present of all the students based on the input data. Hence, the calculated value can be ascertained and trusted as the calculation process is developed to run automatically within the system. To generate warning letter, attendance report and attendance list automatically and accurately along with the required details and in correct format. Student Attendance Management System. This will helps to analyse all the attendance data inserted and then verified either each of the students is following the university attendance policy. If the attendance policy is being violated, the system will automatically generate warning letter, either in Malay or English language to the respective student.

Web Cam:

A webcam is a video camera that feeds or streams an image or video in real time two or through a computer network, such as the internet. Webcams are typically small cameras that sit on a desk, attach to a user's monitor, or are built into the hardware. Webcams can be used during a video chat session involving two or more people, with conversations that include live audio and video. webcam software enables users to record A video or stream the video on the internet. as video streaming over the internet requires much bandwidth, such streams usually use compressed formats. The maximum resolution of a webcam is also lower than most handheld video cameras, as higher resolutions would be Reduce during transmission. The lower resolution Enable webcams o be relatively in expensive compared to most video cameras, but the effect is adequate for video chat session. If a face recognition system cannot determine who will be at the doorway, it will alert you someone unknown has accessed your place. Flowchart of overall system is shown in figure 3.

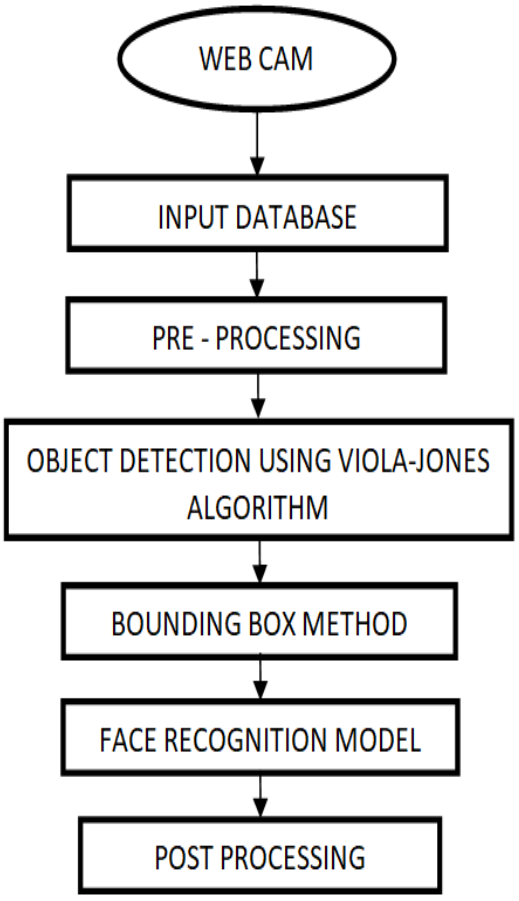

Figure 3: Flow Chart

- The system can be used for schools, college, or universities for taking down attendance.
- The system can be used during parents meeting to show parents about their children's attendance performance.
- It can also be implemented in organisation for attendance.
- Detecting citizenry accurately during a visual closed-circuit television is crucial for diverse application areas including abnormal event detection, human gait characterization, congestion analysis, person identification, gender classification and fall detection for elderly people.

The attendance report will be generated based on the overall attendance of the student for the particular subject. On the other hand, attendance list can be printed out easily when required as the data is ready to be obtained from the system with the format based on the manual attendance sheet. Therefore, attendance report, attendance list and warning letter will be filled, displayed and printed based on the analysis made from the inputted student attendance details with the approved format.

IX. Experimental Results and Discussion

Thus the face recognition system for automatic attendance tracking and monitoring system is designed with better performance results. Figures shows the results of the automatic attendance system based on face recognition. This system is based on viola jones and principle component analysis Gives an idea about the GUI of the system.

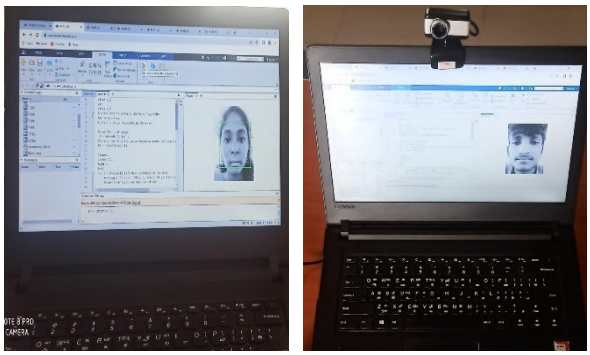

Figure 4: Experimental results

As shown in the figure GUI consist of two pushbuttons namely mark attendance and attendance sheet. By clicking on mark attendance the module will capture the image of group of students and detect their faces as shown in fig by yellow boxes. By clicking on mark the module will automatically generate the attendance sheet and mark the attendance automatically for every student. If we press that button again the excel sheet is updated automatically with the help of a divergent combination of algorithms, this system helps us to achieve desired results with better accuracy and less time consumption.

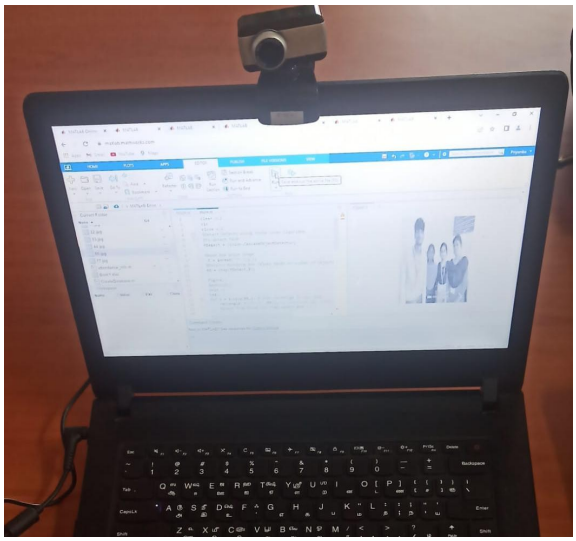

Figure 5: Experimental Setup

The database of subjects for distinct classes is cached in the backend of the system. The system is commenced at start of lecture. The subject name is fetched from the

backend of the system for every hour and the attendance for the same is marked.

There is a lot of scope for improvement over the current work focused on a single classroom of 63 students. For improving detection rate and recognition rate, machine or deep-learning based methods may be incorporated. Further it should be extended to all the section of the department and in-turn the whole university by integration with LMS and or ERP.

The face recognition program saves time, reduces administration work and replaces obsolete electronic equipment for the currently in use stationery content. The device must not be mounted by specialized equipment, because it requires only a computer and a camera. The picture quality and performance must be tested in the real time scenario, particularly when the systems are operated from a live camera supply, and thus the camera plays a decisive role in the system's work. The mechanism can also be used for permission-based access control systems and for safe access authentication (restricted installations). The greatest threat to the system is spoofing. Anti-spotting techniques like eye switch detection can be used in the event that the face recognition is provided by grabbed images for possible improvements to separate live from static images. A feature can therefore be added that lists all unidentified faces and can be manually checked by the user.

X. Conclusion and Future Scope

"An Automatic Attendance System" has been envisioned for the purpose of reducing the errors that occur in the traditional attendance taking system. The aim is to automate and make a system that is useful to organization such as an institute. The camera plays a crucial role in the working of the system hence the image quality and performance of the camera in real-time scenario must be tested before actual implementation. This method is secure enough, reliable and available for use. No need for specialized hardware for installing the system in the classroom and institution. It can be constructed using a camera and computer. This replaces the manual system with a simple, reliable, cost-effective, time-saving automated system as it eliminates the stationary material and paper work. It is therefore predicted that this method would produce desired results and could be applied for logout in the future. In the near future, other strategies could also improve efficiency. We can say that a safe, stable, rapid and efficient class attendance management system was developed to replace a manual and inefficient system.

Automatic attendance system has been developed to popularize errors. The efficient and reliable system of the attendance that can replace the old manual methods in the office environment. This method is sufficiently stable, accurate and ready for use. There is no need for specialized equipment in the office to mount the device.

The future extent of the proposed work can be, catching numerous definite pictures of the students and utilizing any cloud innovation store these pictures. This framework can be designed and utilized in ATM machines to identify frauds. Also, the framework can be utilized at the time of elections where the voters can be distinguished by perceiving the face.

REFERENCES:

[1] Phillipe Ian Wilson, John Fernandez, "Facial Feature Detection Using Haar Classifiers. Journal of Computing Sciences in College";2006.

[2] A Madhu Sudhan, et al. “Webcam Based Computerized Attendance