



# Automated Attendance Management System For Multiface Detection Using LBP

<sup>1</sup>Sumana J, <sup>2</sup>Kavana A, <sup>3</sup>Dr. S Srividhya

<sup>1</sup>Student, <sup>2</sup>Student, <sup>3</sup>Prof. and HOD

<sup>1</sup> Department of Information Science and Engineering,

<sup>1</sup> BNM Institute of Technology, Bangalore, India

*Abstract:* A key responsibility in class is monitoring student attendance. The total time allotted for the class cannot be used since attendance is manually taken. By putting in place an automatic attendance system, class time may be used very effectively. Any individual may be identified only by their face. The project's primary goal is to develop a facial recognition- based attendance monitoring system for educational institutions in order to improve and modernize the present attendance system and make it more effective and efficient than it was previously. The existing outdated approach is quite ambiguous, which results in erroneous and ineffective attendance taking. When the authority is unable to enforce the regulations that are there under the old system, several issues occur. The face recognition system that employs LBP will be using Haar cascade technology as its foundation. The suggested system was created to collect camera input, identify different faces, and the faces are previously registered, record the data into a list and be connected to Excel sheet.

**Keywords— face recognition; attendance system; LBP- Local Binary Pattern; Haar cascade.**

## I. INTRODUCTION

The previous attendance mechanisms used to keep track of students attendance are no longer very effective. Every year, more students enroll in schools and universities, and it is crucial that each student shows up to class. Therefore, it is essential to explain the efficient system that automatically logs a student's attendance. In order to evaluate students performance, maintaining attendance is crucial in all institutions and universities. Every institution or university has a unique approach in this area. While some have embraced the practices of automatic attendance utilizing various biometric techniques, others still manually record student attendance using attendance registers, marking attendance sheets, or file-based approaches. However, with these techniques, students must queue up and wait a long time to enter the classroom.

Although there are several biometric systems on the market, all of them use the same key authentications. Every biometric system starts with an enrollment procedure during which the distinctive traits of a person are saved in the database, followed by processes for the individual's identification and verification. These two procedures compare a person's biometric characteristics to a template that had previously been saved and taken at the time of the student's enrollment. For automated student attendance in the classroom setting without student input, this system employs a facial recognition technique.

The new attendance management system was created with the intention of computerizing the conventional techniques of taking attendance. Therefore, attempt to move on to the newest forthcoming trends on creating attendance systems in this section to grab students' attention and get them involved in observing technology. This is the reason why attendance management systems for colleges and universities have developed a strategy to guarantee that students actively participate in class.

The attendance management system has been deployed to keep track of student attendance. Since the implementation of this attendance system, it has been more challenging for students to miss courses without the staff being aware of it. To increase the effectiveness of instruction, an attendance management system counts the number of pupils and encourages them to be to class on time.

To ascertain if a student is in class or not, a roll call is typically done, which typically wastes a lot of time. Face recognition has made significant advancements recently because to new technology and the growth of deep learning, which has inspired a new way of thinking about how to address the enrollment problem. Therefore, the concept of automatically counting the number of pupils in a class based on facial recognition is included in order to save time.

## II. RELATED WORK

The issue of face identification in biometric systems in multiple real-time circumstances, such as illumination, rotation, and scaling, is addressed by an automated attendance management [1] system. In this paper, a novel method that automatically recognises and registers students who are present at a lecture and is enhanced by computer vision algorithms integrated on an existing Learning Management System is presented. The technology functions as an additional teaching tool for educators by fusing machine learning algorithms with adaptive techniques for monitoring face changes over a longer period of time. Because the programme is entirely software- based and it may be deemed environmentally friendly because it uses less paper and saves time.

Face Recognition Attendance System [2] uses the central idea of the image processing. When using the suggested method, it is possible to identify student faces and provide recognisable proof of them. This is done by comparing the face's characteristics to those of the framed people, for which the model works flawlessly and is simple to analyze when using the suggested calculation. In order to identify things in a photograph or video, the Haar Cascade object identification rule, developed by machine learning experts Paul Viola and Archangel Jones, is used.

Attendance management software with Bluetooth [3] In universities and colleges, teachers physically take attendance by either calling out students' names or handing around an attendance sheet for students to sign to certify their attendance. These procedures are laborious and time-consuming. Therefore, a rapid, accurate, paperless technique of taking attendance utilizing the instructor's cell phone has been provided in this paper. The presence of the student can be verified by the instructor's mobile phone using an application software that is installed that allows it to query students' mobile phones via Bluetooth connection and transfer the Media Access Control (MAC) addresses of the students' phones to the instructor's phone.

Iris recognition as part of a biometric attendance system [4] An automated approach for managing attendance is suggested in this study. Based on algorithms for iris detection and recognition, this system will automatically identify students as they enter the classroom and record their attendance. It can increase the accuracy of attendance records and prevent fraud problems that arise when utilizing a manual register. This method is economical.

A functional access control system built on a beautiful QR code [5] It is suggested to provide access depending on the detection of QR codes. The QR code will be examined in this technique, and if it matches the data that has been saved, access will be granted to the user; otherwise, access will be denied. This technique offers superior safety and security and is ideally suited for household purposes.

System for managing attendance based on fingerprints [6] This essay has discussed the conception and creation of a portable attendance system based on fingerprint recognition. The system assisted in reducing number of issues, including the possibility of cheating when recording attendance, ease of use for lecturers in maintaining attendance records, increased security provided by the encryption technique), and time savings from taking attendance on the go rather than in a line, Making this system wireless and utilizing the IOT.

The goal of the face recognition attendance system [7] is to reduce mistakes that occur with the conventional (manual) attendance taking system. The goal is to automate and create a system that will be helpful to institutions like universities. The way of taking attendance in the office that is precise and efficient and can replace the traditional manual methods This approach is workable, trustworthy, and sufficiently safe. No specialized gear is required to install the system in the office. A camera and computer may be used to create it.

Intelligent Attendance System [8] The administrator has already stored the subject-specific daily attendance records of the pupils. The system begins capturing pictures automatically as the time for a certain topic approaches. Once a face detection and identification algorithm has been applied to the provided image, students who have been identified are recorded as present, and their attendance is updated with the appropriate time and subject ID.

System for Managing Student Attendance [9] The system is a web-based tool created for tracking daily student attendance in university departments. It makes it easier to acquire information on a specific student's attendance in a certain class. This system will also assist in creating reports and determining a student's eligibility for attendance. The method may save both human and material resources while also enhancing work efficiency and student learning and development.

Face recognition technology is used in the classroom's attendance system for students [10]. This essay offers a suggestion for tracking attendance using facial recognition technology. It also offers a thorough explanation of the outcomes and their analysis. Cameras are used to recognize faces, and verification is completed. The attendance is then recorded. Only a small number of people should use this procedure, yet the findings are almost 87% accurate. This approach yields inaccurate findings because it cannot accurately identify large numbers of people.

### III. METHODOLOGY

The facial recognition system essentially has two modes of operation. i) Verification or authentication of a facial image: This process simply compares the input facial picture with the user's associated facial image to determine whether the user needs to be verified. Essentially, it is a 1X1 comparison. ii) Identification, also known as facial recognition, simply compares the input facial picture to every facial image in a dataset in an effort to identify the human whose face corresponds to that image. Essentially, it is a 1X1 comparison. The proposed idea is schematically shown in Figure 1.

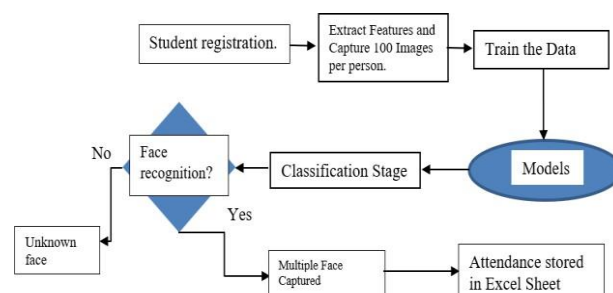


Fig 1. Block diagram of proposed System.

**A. Face Parameter the LBPH uses 4 parameters:** The radius indicates the area surrounding the centre pixel and is used to construct the circular local binary pattern. Typically, it is set to 1. The number of sample points needed to create the circular local binary pattern is called the neighbours. Remember that the computational cost increases as you incorporate more sample points. Usually, it is set to 8.

**B. Training LBP Algorithm:** The algorithm must first be trained. Use a dataset that contains the face pictures of the persons you wish to recognize in order to achieve this. You must also provide an ID (which might be a number or a person's name) to each image so that the algorithm can use it to identify an input image and provide an output. The same ID must appear on all images of the same individual. Let's look at the LBPH computational stages with the training set previously created.

**C. Using the LBP operation:** The initial computational phase of the LBPH is to produce an intermediate picture that, by emphasising the face features of the original image, more accurately depicts the original image. The technique does this by utilizing a sliding window notion based on the radius parameter and neighbour.

**D. Extracting the Histograms:** The picture created in the previous step may now be used to extract the histograms. Since the image is grayscale, each histogram (from each grid) will only contain the places that correspond to the occurrences of each pixel intensity. The next step is to combine each histogram into a single, larger histogram.

**E. Running the facial recognition algorithm:** It has already been trained, at this point. Each histogram produced serves as a representation of one of the training dataset's images. As a result, after repeating the processes for a fresh picture after receiving an input image, a histogram that accurately depicts the image is produced. Therefore, all that is required to locate the picture that corresponds to the input image is to compare two histograms and return the image with the closest histogram. may determine the distance between two histograms using a variety of methods, such as the Euclidean distance, among others. Use of the well-known Euclidean distance is possible in this instance. The ID from the image with the closest histogram is the result of the method. The algorithm should also return the calculated distance, which can be used as a "confidence" measurement. If the confidence is lower than the threshold set, it is assumed that the algorithm has successfully recognized the image. If the confidence is higher than the threshold, it is automatically estimated that the algorithm has currently recognized the image.

**F. Attendance Marking:** When the data is received, the system creates an attendance table containing the name, roll number, date, and time with the current pupils' roll numbers after the face is recognized. and after that sends information to automatically create a CSV file from the table. The file may be opened in the excel spreadsheet by letter employee

#### IV. RESULTS AND DISCUSSION

The suggested technique may be used to track attendance of persons and to record it. The method is extensively applicable in institutions and businesses. The suggested approach continuously monitors each student to record their attendance. In comparison to the conventional attendance marking systems, the early experiment's results demonstrate enhanced performance in the estimate of the attendance. A GUI allows users to communicate with the system. Users will primarily be given three options here, including student registration, teacher registration, and attendance marking. The student registration form must be filled out completely by the pupils. After pressing the register button, the web camera starts up automatically, a window appears, and faces in the frame begin to be recognized. Then, 100 photo samples are automatically started snapping. The training pictures folder will then get the pre-processed photographs. The faculty are expected to register with the appropriate using the specified email address.

Fig 2. Home page



Fig 3. Student registration



Fig 4. MultiFace Recognition



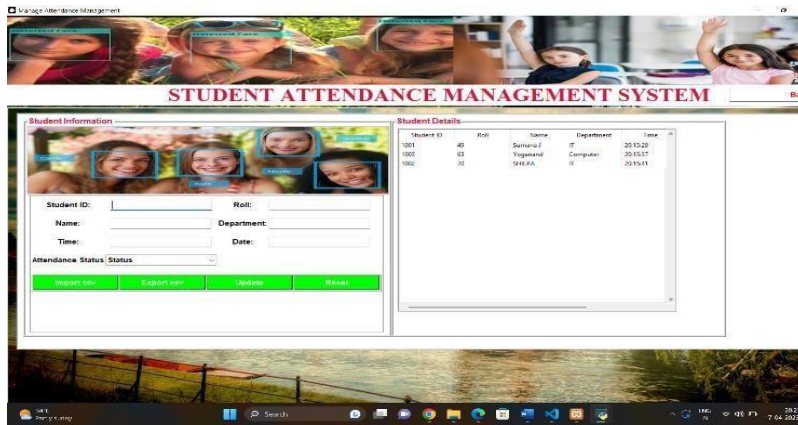


Fig 5. Attendance page

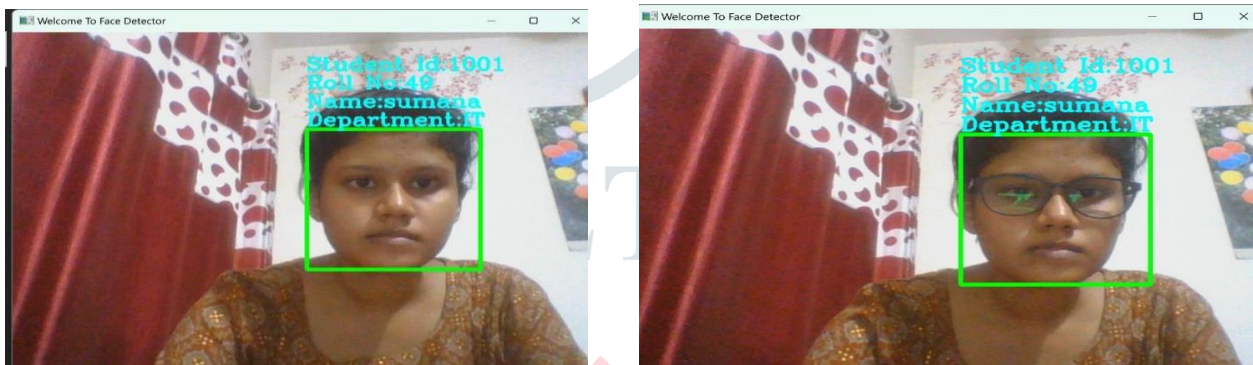


Fig 6. Face Recognition Ability (Accessories)



Fig 7. Face Recognition Ability (Illumination).

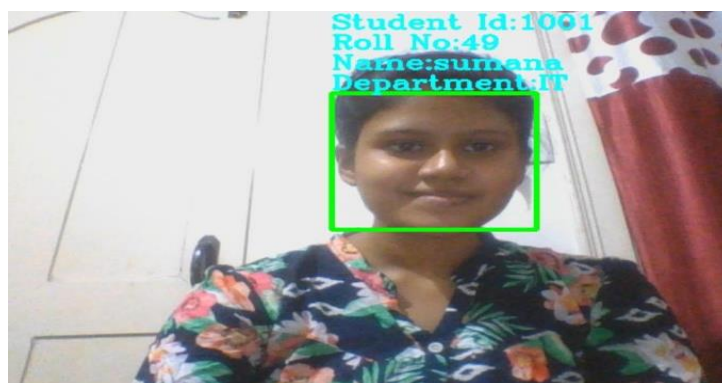


Fig 8. Face Recognition Ability.



**Fig 9. Face Recognition Ability (Accessories)**

## V. ADVANTAGE OF PROPOSED SYSTEM

Suggested system's algorithm is significantly more straightforward and effective. The usage of an easy-to-use Framework makes the system simpler. It also features far less complicated database setups and a more effective algorithm. Due to its platform independence, the system is more effective.

## VI. CONCLUSION

Using facial recognition technology to construct an attendance management system has number of benefits over conventional approaches. It offers a more precise and effective method of monitoring attendance lowers the chance of mistakes, and does away with the necessity for manual record-keeping. It also improves security measures by guaranteeing that only people with permission may enter the building. Overall, implementing such a system may boost production, cut costs, and improve organizational efficiency. However, it is crucial to take account any privacy issues and make sure that the right steps are taken to secure personal information.

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