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Survey Paper on THE TUTOR CONNECTION: WORKPLACE MADE BETTER

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Abstract- When the concept of educator (teacher) management is appropriately acknowledged, progress and progression may be made in the overall structure of the educational system. Teachers are the ones who impart knowledge and information to the nation's future citizens, or youngsters, in such a manner as to ensure that their growth and development take place in a suitable fashion and that they may achieve their academic goals and objectives. The higher authorities and teachers can do their daily tasks with great efficiency and effectiveness under the suggested approach. A web gateway will be available for both higher-ups and management personnel like principals and clerks. Teachers will have access to a mobile application. The system will have added features like linguistic support so that anyone may effectively use it. Additionally, a method for tracking professor attendance is being created that instantaneously validates each professor's biometrics

Keywords: Face recognition, Eigen faces, PCA ,MATLAB, Viola – Jones, Feature extraction, Adaboost, Video acquisition.

1. INTRODUCTION

The existing approach is solely based on labor-intensive human procedures. As a result, this method is designed to increase the process' effectiveness and simplicity. Posting instructors and sending appointment letters to them are both lengthy processes. Additionally, keeping up with the service books of instructors manually is quite difficult. When the concept of educator management is appropriately acknowledged, progress and progression may be made in the design of the educational system as a whole. Teachers are the ones who impart knowledge and skills to the nation's future citizens—children—in such a way as to ensure that their growth and development take place in an employable fashion and that they may achieve their academic goals and ambitions. The whole administration of procedures from their recruitment to

retirement in the public sector has been the main area that has been

considered for the "Teacher Management System".

The current system relies entirely on human processes, which are quite time-consuming. Therefore, this system is created to enhance the process' efficiency and ease of operation. A centralized Android app for teachers would make it simple for them to manage their appointment letters, leave applications, transfer forms, service books, and productivity tools like direct notifications. It would also include an attendance system that used a biometric scanner or real-time face recognition. The "Teacher Management" approach that has been presented is extremely effective and efficient for both teachers and higher authorities in carrying out their daily tasks. Higher authorities (State level, District level, and Taluka level) as well as school or college administration employees like principals and clerks will have access to a web portal under the proposed system.

All of the crucial documents might become destroyed during disasters and be lost forever. The relationship between the professors and higher officials is also not transparent. By applying the suggested system, which is very user-friendly and technologically sophisticated, all these challenges and problems may be resolved. The system will have added features like linguistic support so that anyone may effectively use it. Additionally, there will be centralized data backup and storage, which will be useful in the event of calamities and connection problems. Additionally, biometric attendance solutions enable you to swiftly and precisely detect whether someone takes an excessively lengthy break, arrives late or departs early, or even fails to show up at all. All of these problems with manual systems are being solved by a computerized, cutting-edge solution. We provide online portals to all government entities (State, District, and Taluka), as well as the management staff at schools and institutions, such as clerks and principals, for jobs like posting instructors, organizing transfers, updating and maintaining papers and service records, etc.

2. LITERATURE SURVEY

There isn't currently a system for managing teachers, but there is one for managing employees. Teachers fall within the employee group, hence the survey on the teacher management system is provided below.

Jinhua Liu, et.al [1] has put in place a web-based management information system that is intended for university teaching and instruction. The application itself is still in its early phases, despite the fact that the present research on the classroom management information system has begun to take shape. It is crucial to use information technology to support the management of teaching equipment and the entire process of fine management reform of teaching equipment. Calculating the complexity of information pertaining to university education and teaching management would greatly improve the system's processing efficiency. The relational database model was developed to put the management information system architecture for university teaching and education into practice. Comparative experiments are designed to examine the efficacy of this method in order to confirm it. According to testing results, this method may dramatically shorten query times while simultaneously enhancing recall and precision for low information.

Last but not least, the relational database model was developed to put the management information system architecture for university teaching and education into practice. Comparative studies are designed to verify the effectiveness of this strategy. In this research, a web-based management information system for university teaching and education is created. The design idea, structural design, and management technique of the university education and teaching management information system are all established by taking a look at the demands of the system. In order to greatly improve system processing efficiency, the complexity of university education and teaching management information is computed. The priority of query information is then determined based on this information. Last but not least, the relational database model was developed to put the management information system architecture for university teaching and education into practice.

Mr. Pratik Udayshankar Singh, et.al [2] The strategy is useful since it has been suggested for all users to retain information at various levels. It links the employee and administrator, simplifying maintenance. Now, without the assistance of a manager, administrators may easily send tasks or alerts to the relevant workers, and employees can seek time off or react to assignments. In comparison to other systems, this one gives employers the most functionality, including information on given tasks, leave details, and leave history. It basically consists of an employer-only web portal that only functions on intranets (Only works within the network provided by organization). Salary history cannot be stored. It does not provide employees a platform. The key components of this system are Employee self-service, Leave management, Task management, Notifications, and Employee profile. During the user registration process, a unique username and password combination are given to each user. Since the system contains sensitive employee data, the administrator has the option to track all activity logs by date and time. The creation of a work center's scheduling system is the goal of "Employee Management System." One of the instruments that streamline the process is scheduling. Activities and alarms will be easily notifiable in the organization where it is deployed, and they may even be accessed online. However, manually scheduling several events—whether for personal or professional reasons—requires work and, if done properly, may lead to confusion. To manage all the data about the employees of any particular company, a distributed programme known as Employee Management System was developed. It records data on the confidential information of their personnel. The software is simply a compilation of programmes written in PHP. It may be used by anybody who can read and comprehend plain English. It is easy to use and just needs the user to adhere to a few straightforward instructions. It can swiftly complete a range of organizational or corporate tasks. The powerful front-end coding languages HTML, CSS, and PHP as well as the back-end Microsoft SQL Server were used to construct this software project. Utilizing the programme couldn't be simpler. The project includes modules like Employee and Admin. This version of the programme allows for multiple users. The user's input will be taken into account when

the software is upgraded or developed in the future.

Rishabh Bajpayi, et.al [3] avoids data input errors and helps to lessen or eliminate the issues with the present system. Compared to the present system, it is more accessible, easier to implement, requires minimal maintenance, produces correct data, and saves a significant amount of time. The author of this paper utilized an Android app. both employees and employers can utilize the app. The major functionality of the system they presented is the ability to calculate working hours based on in and leave times. Additionally, the individual might voice their opinions to their superior level authorities. The system's biggest flaw is its lack of functionality, which is why it is so widely used. Basic functions are not being carried out. For instance, we are unable to submit a leave of absence application. As with more conventional methods, the organization's current personnel management system still only uses pen and paper to record employee data. In order to do this, a significant number of registers must be preserved, which results in a glaring waste of time when preparing reports or looking up personnel information, as well as the lost data in the event that any file is destroyed.

The personnel management system, an application-based system, has two apps that have been developed. One programme is used by employers to keep track of employee information, and the other is used by employees to track their attendance. Every company, public or private, employs an information system to keep track of personnel information. However, it has been shown that many small businesses in India still keep records using paper and pen. Despite the fact that many advanced technical solutions are capable of completing this work, they are all too expensive for these small businesses to afford. In this essay, we'll talk about how to solve their problems more cheaply. This system will monitor each employee's attendance, and at the end of the month, their wages will be calculated.

It also calculates the total number of hours worked by each employee, including overtime. The employer is given entire discretion over how to manage each employee's holidays and workweek because every small firm has different preferred holidays and week off rules. Since it saves a lot of time and features error-free pay computations, conflicts between the HR Team and the employees are avoided. so that both the employer and the employee may focus on their respective roles in order to advance the company. **Xiaojun Bai, et.al [4]** designs and implements an Android face recognition attendance system that successfully overcomes the shortcomings of conventional manual attendance and is applicable to real-world use cases like staff and student attendance. In this research, a method is developed that employs an Ada boost cascade classifier to identify facial characteristics and LBP features to recognize faces and produce histograms. The mobile platform and facial recognition technology may be used to improve the efficiency of the manual attendance process. By contrasting the face recognition experiment results, the final face recognition system of check on work attendance on the Android platform is built and executed. This design separates the face recognition system's three function modules—attendance sign-in, attendance record, and information input—and provides a theory of face identification and classification. It also assesses how the face recognition classifier is built. This study uses the Adaboost cascade classifier to detect faces on the Android platform. In order to effectively identify people during the recognition stage, LBP features are also collected and fed into the classifier after which the similarity measurement function is generated. In the training step, the face picture is extracted using the LBP feature, the histogram is produced, and then a face recognition classifier is created using the LBP histogram. The facial recognition attendance system created and put into use in this work is compared to the Fisherface and Eigenfaces algorithms and tested using the ORL face database. The results of the evaluation of 30 testers demonstrate that the facial recognition accuracy of this system may meet the practical usage condition. The Adaboost cascade classifier is used in this work to identify faces on the Android operating system. Training and testing on examples are necessary for creating a face recognition classifier. During training, the facial image and its related label should be entered concurrently. The LBP features are consistently extracted from these pictures by the face recognition classifier, which then statistics the LBP histograms before using the feature vectors made up of these histograms as the feature vector of this face.

The face detection stage of the face recognition attendance system is essential. It is employed to ascertain whether a face is visible in a photograph. If so, features will be extracted from and trained on in a specific area of the face. In this study, face identification is accomplished using the Adaboost cascade classifier. Adaboost's tasks often include classification and regression. Iteratively, several weak classifiers that have been trained on a training set are superimposed to create a strong classifier. The method involves changing the data distribution repeatedly, modifying the weight of each sample in accordance with its classification result as well as the overall accuracy of the most recent training period, and then publishing the findings.

Mashood Sajid, et.al [5] implemented the main objective of the research is to assess current solutions and, taking into account the shortcomings of their proposed systems, create a superior one. For the instructor, students, and administration, keeping track of attendance using this way is tremendously useful. Algorithms are employed to match student faces with database faces. They adjusted the student seating arrangement in order to recognize faces and keep track of attendance. For each lesson, they kept track of who was in attendance. These weighted masks show that the most important features of the face, such as the nose, eyes, lips, cheeks, and forehead, have the most value for recognizing the face. Students can record attendance by matching their faces to those in the database by snapping a photo with the fixed cameras—one at the front and the other on the roof. They positioned the seats to accurately reflect attendance even if the system periodically failed. Android-powered devices provide a fresh approach to the problem above the earlier techniques. For instance, the recommended system's face detection feature, which integrated a CCTV camera with a mobile Android-based smartphone improved with 3D modeling. They proposed a method in which faces are initially identified, followed by facial detection, and attendance is then recorded and stored in a SQL data source. The main objective of the study is to assess other people's theories and develop a better theory by taking into consideration the shortcomings of their recommended approaches. The primary method for overcoming challenges in face recognition attendance tracking is matching the pictures. Recently, a conceptual model for an automatic attendance marking system employing face recognition was taken using those images that were purposely captured and put to the central database. The design of this system is quite simple since it just uses two cameras—one for detecting and the other for capturing. In a procedure known as "continuous observation," photos are continuously collected and compared with databases to ensure proper attendance.

Mohammad Salah Uddin, et.al [6] devised a technique that enables an organization to totally control every employee's work hours. It reduces overpayments, which are commonly caused by transcribing, interpretation, and intentional actions, and aids in controlling labor costs. In addition, there is no longer a need for manual procedure management workers. Although adhering to labor laws might be difficult, a timesheet system is essential for making sure that the regulations regarding evidence of attendance are followed. A time and attendance system has several benefits for businesses. It enables a business to totally control how long each person works. By reducing overpayments—which are commonly caused by deliberate, accidental, and inadvertent errors—it helps with labor management. The traditional identity card is replaced with a mobile application thanks to technology. The application was set up on the user's mobile device. The programme had been given a unique user ID and a location (a GPS point). A time and attendance programme was installed on the workstation to process the data received from user mobile devices and store the information (time, entering, and departing) to the Database. Location is the key to attendance in the location-based time and attendance system discussed in this article. A GPS gadget may be used to locate both an employee's and an organization's whereabouts. The employee is present in the company if the coordinates line up. For Android-compatible smartphones and tablets, we are actively developing a solution. Support for iPhones and other mobile phones will ultimately be added. The GPS identifies a specific location for each organization. An employee may be located using a GPS device (such as a mobile phone, GPS watch, or other GPS-enabled gadget, etc.). A GPS device (such as a

mobile phone, GPS watch, or other GPS-enabled device, etc.) may be used to find a worker if their position and the location of the GPS device are both known. It is reasonable to claim that an employee is present in the office when their location and the organization's location are almost the same. This research suggested a new location-based time and attendance system that utilized location as verification of attendance. The use of a biometric attendance system in combination with wireless communications has been shown by systems. The development of palm-print technology, which produced an attendance system to monitor employee attendance, however, exposed the shortcomings of the system. In the meanwhile, they had developed a comparable solution that made use of a wireless Iris recognition attendance management system. Security is the main concern with biometric identity; if our database is lost, our biometric identification is entirely compromised.

Smitha, et.al [7] developed a system that watches live classroom footage, detects students' faces, and, if the face is identified in the database, records their attendance. The new method will be quicker than the previous one. The purpose of this system is to build a facial recognition-based attendance system. Here, the face of the individual will be considered while registering attendance. The idea is to identify and count approved students as they enter and depart the classroom by using facial recognition and Radio Frequency Identification (RFID) in tandem. A true record is preserved for each student who has registered with the system. Before their photos are taken and included to the dataset, each student in the class must register by giving the required information. Each lesson's live streaming video from the classroom will reveal familiar faces. The visual data from the dataset will be contrasted with the recognized faces. If a match is discovered, the pertinent student's attendance will be noted. Following each session, a list of absentees will be mailed to the faculty member in charge of that particular lesson.

The students must thoroughly fill out the student registration form. The camera starts up right away after hitting the register button, a window appears, and faces in the frame start to be identified. The faculties must fill out the given faculty registration form with their email addresses and the correct course codes. The relevant faculty member must input the course code each session. The camera will automatically activate when you enter the course code. The recommended system will be able to track attendance by employing face ID. It will identify them after detecting faces using a camera. After recognition, the attendance record will be updated to reflect the recognized student's attendance. Face recognition technology is employed in almost every business today and is crucial in the digital age. a technology that mostly used biometrics. It may be used for security, identity, and authentication and has several benefits. Even though it is less reliable than iris and fingerprint identification, it is nonetheless often used since the method is non-intrusive and contactless. Additionally, companies, schools, universities, and other establishments may track attendance using facial recognition technology. This system's objective is to develop a facial recognition-based class attendance system because the manual technique of taking attendance currently in use is cumbersome and difficult to maintain. In addition, it's possible that a proxy will appear.

Diwakar Dhillon, et.al [8] recommended utilizing the MATLAB programming language to create an automatic attendance system. We want to create a useful "Automated Attendance System Based on Facial Recognition" that may be used in many settings. The program's face detection function enables face authentication, which saves time and eliminates the potential of proxy attendance. Therefore, this method may be applied in a situation when attendance is crucial. The system, which is based on MATLAB, is easy to use. Using a literature analysis on video and picture based face recognition, we learn about the many face recognition algorithms that are available and that face identification is frequently a two-step process that combines face detection and face recognition. The proposed system takes use of the eigen face-based Principal Component Analysis (PCA) approach. This approach analyses the test and training photographs to determine which students are present and which pupils are not. The attendance record is kept in an excel spreadsheet that the system updates automatically.

To begin with, a photo of each student's face will be required to document their participation. Either making a movie or taking a

photo with a camera will provide this image. The system will analyze the film and identify the students based on their facial characteristics after the camera takes a quick video of the student for a few seconds. The technology does facial recognition after the frames have been taken. The cropped face is then examined using a facial recognition algorithm that is suitable for the situation. The supplied image is identified by comparing it to a built-in face database.

Dr. Gayathri s., et.al [11] Face recognition systems that use artificial neural networks and Eigen faces apply a small set of 2-D qualities rather than 3-D geometry for the recognition process. The weighted sum of the Eigen faces is used to calculate the primary factors, commonly referred to as the Eigen vectors. It is recommended to employ Eigen faces, which determine a picture's intensity, in a brand-new approach to face recognition. The Jacobi's method is used to find the Eigenvalues and Eigenvectors in an artificial neural network. The automatic attendance system described in the study is employed in a classroom context and is unique from the conventional facial recognition system. A 3-D model is advised in order to recognize a student's face in a classroom setting. The management of student attendance is incredibly time-consuming and labor-intensive. The biometrics used in today's attendance system make it quick and accurate. The demonstration of a facial recognition system includes continuous observation of the students' motions. The recommended method is reliable and efficient for locating faces in a classroom since it uses an image processing technique. The proposed work accurately records attendance by detecting faces. An automated attendance system in a classroom uses the Ada-Boost technique to recognize faces. Features are extracted using the Local Binary Pattern (LBP) and Histogram of Oriented Gradients (HOG) methods. A Support Vector Machine (SVM) classifier is used to detect faces. After utilizing the Viola Jones algorithm to recognize faces in the gathered photographs, the system uses the Eigen face approach to identify faces. Using this method, Eigen faces—faces made up of eigenvectors—are computed and analyzed. The method also compares the Eigen faces to establish the presence and identification of a person (face). The MATLAB software is to be used to carry out the proposed job. It comes with a toolkit for handling databases and pictures. It is used to recognize and detect faces by using the algorithms and the toolbox. The MATLAB also offers resources for building an interactive GUI.

The system will recognize the faces and record the attendance against them when the user loads the photos using this GUI. You may view the updated database using the GUI. The MySQL workbench is used to generate the sql database required to maintain student attendance. There are tables containing rows and columns in the database. The database may be operated on by adding and deleting data using the sql query. The rows display the data for each student.

Preeti Mehta, et.al [12] has suggested that each institute have their own system for keeping track of attendance. Some people still use the archaic manual technique to record attendance, while others use RFID. Other biometric techniques are used, such as iris and retina scanning, palm print identification, thumb imprint, and ear recognition. One of the biometric technologies that has received the most research attention recently is face recognition, which has a wide range of commercial uses in areas including security and surveillance, entertainment and virtual reality, and human-machine interfaces. All of these methods waste students' time by resulting in long lineups for attendance recording. In contrast, facial recognition is unobtrusive, contact-free, and has natural acquisition, giving it an edge over these older techniques. A biometric identity must have the following qualities: universality, permanence, uniqueness, performance, and measurability. Utilizing the camera module for the Raspberry Pi and the MATLAB R2014a version, the primary objective of this research is to develop an automatic attendance system. For recording pictures and videos from the classroom, the system contains a Raspberry Pi camera module and a Raspberry Pi 2 model B module. MATLAB R2014a is used to implement the Viola-Jones, Local Binary Pattern, and Oriented Gradient histogram algorithms. The Raspberry Pi hardware's MATLAB support package must be installed in order for MATLAB and the microcontroller to communicate. As a consequence, MATLAB may be used to gather and interpret data

from sensors and imaging devices linked to the controller board. In image processing, detection and recognition are the two main responsibilities.

3. METHODOLOGY

[1] SYSTEM ARCHITECTURE:

In the proposed system, a central server provides access to a digital service book, teacher information, salary information, transfer information, and teacher evaluation information for State, District, and Taluka level authorities. School level authorities, such as teachers, principals, and clerks, also have the same access. Additionally, school officials may track and record the instructors' attendance on a regular basis utilising the biometric attendance system.

Note: What is a service book?

A document that includes concise information about instructors and their whole service history, from hiring to retirement. This book includes information regarding the teacher's badali details, vetan vadh, leave records, payment records, and monthly progress reports. Additionally, a clerk updates the Service Book each month, and the principle sir signs it.

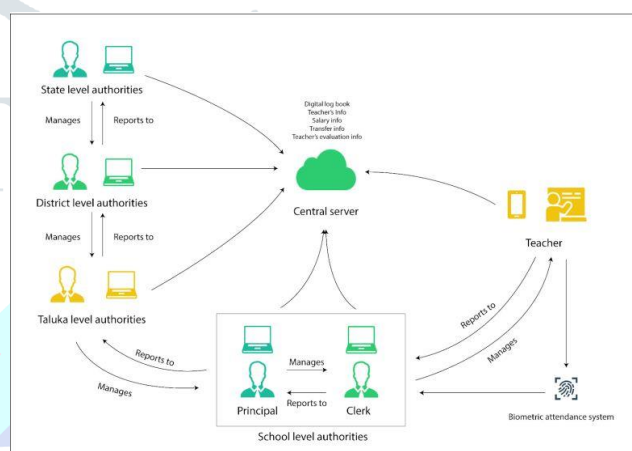


FIG 1: SYSTEM ARCHITECTURE

[A] STATE LEVEL AUTHORITIES:

India's states each have their own independent ministries for education. The cabinet minister for education in a given state is followed by the state minister in that state's ministry of education. The state governments create education policy as well. The state legislature also has provisions for actions and legislation. When necessary, they are brought.

Role of State Authority:

- (i) The state should create a statutory council for education, whose head should be the out-of-date Minister of Education.
- (ii) Regular meetings should be held by a permanent committee made up of state-level officials in charge of various areas of education.
- (iii) Like the Government of India's Educational Advisor, the Secretary of Education should be an educator rather than an administrator.

A central server provides access to a digital log book, teacher information, salary information, transfer information, teacher evaluation information, and reports to higher authorities regarding changes to the aforementioned information about teachers. The state level authorities manage district level authorities, which in turn manage Taluka level authorities, who in turn manage school level authorities.

[B] DISTRICT LEVEL AUTHORITIES

As the basis and goal of all of its public acts, the district government must specify the management's role and responsibilities as well as its management objectives. The local or national government should be a designer in social administration.

District administrators are in charge of developing, implementing, and evaluating district processes and policies. As district administrators, superintendents and other central administrative staff are supervised by a school board. Central management and district superintendents make crucial decisions that have an impact on every employee. The school district may support and advocate for

improvements in the school climate through its goals, training objectives, and promotional campaigns. District administrators need to be mindful of concerns like employee wellbeing, burnout, and promoting a positive and healthy culture in the classrooms.

A central server provides access to a digital log book, teacher information, salary information, transfer information, teacher evaluation information, and reports to higher authorities regarding changes in the aforementioned information about teachers. The district level authorities manage Taluka level authorities, and they further manage school level authorities.

[C] TALUKA LEVEL AUTHORITIES:

One of the main responsibilities of municipal governments is public education. From pre-kindergarten through community college, public schools are funded mostly by local and state governments. Most of these money come from local and state taxes. Education policy choices are made by all local governments, including county, city, town, and district administrations. In addition to making crucial decisions on pedagogy and funding, it is their duty to serve as a bridge between local communities and state education organizations. Local governments have the power to raise taxes and have the power to redistribute funds for schools to fund new priorities. They choose what courses to offer, how to set performance standards, where to locate a new school, safety, health, or traffic concerns, and the role of a school in the community, among many other things. In Poland, regulations mostly dictate what a local administration at the municipal level is responsible for.

[D] SCHOOL LEVEL AUTHORITIES:

The Board officially monitors and appoints the Heads of School. After speaking with the School Executive, considering a decision made by the School Committee, and correctly allocating tasks as required, the Head will exercise his or her authority. The dean of school will suggest students for nomination to various positions. The effective general management of the school, as well as academic leadership, strategic vision, and a high level of education for every student, are all under the control of the head of school. According to the School Executive, the Head of School is in charge of:

1. Developing the school's strategic plan, which includes a strategy for its staff and resources.
2. Involving the School's staff and the senior university administrators in the creation and endorsement of the School's strategy
3. Analyzing the School's accomplishments in light of the objectives stated in its strategic plan, as well as in its strategy for personnel and resources.

[2] FLOWCHART FOR FACE RECOGNITION BASED ATTENDANCE SYSTEM:

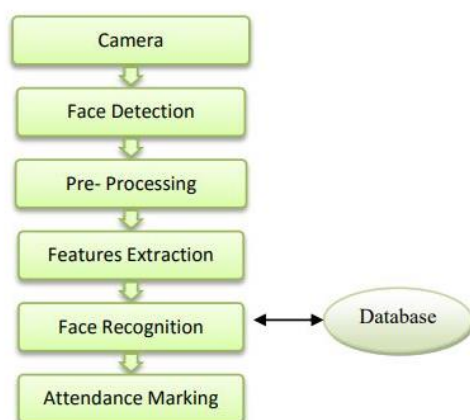


FIG 2: STEPS INVOLVED IN FACE RECOGNITION BASED ATTENDANCE SYSTEM [12]

Steps for Implementation:

i) **Video Acquisition:** The video is captured using a Raspberry Camera module that is wired into the classroom, with the goal of capturing all of the students' faces in the area of interest. The camera is attached to the controller board and will wirelessly connect with a WIFI dongle to send the video to MATLAB for

processing.

ii) **Image conversion:** A frame from the video will be chosen. The chosen image will be transformed from its RGB format to a greyscale image for additional processing.

iii) **Face Detection:** The Viola- Jones algorithm will be used to identify the faces. For face identification applications, MATLAB includes a system object from the Computer Vision Toolbox.

iv) **Image pre-processing:** Following image pre-processing, the features will be retrieved from the cropped discovered faces. In the preprocessing stage, the contrast will be improved using the *imadjust* function, the background will be removed using the *strel* function, and the *greyscale* picture will be converted to a black-and-white image by removing tiny items from the binary image using the *bwareaopen* function.

v) **Features Extraction:** The processed picture will be used to extract the features. Six characteristics will be retrieved in all, three of which—the nose, mouth, and eyes—will be used by two different face recognition algorithms, LBP and HOG, and stored in a database.

vi) **Face Recognition:** The processed picture will be used to extract the features. Six characteristics will be retrieved in all, three of which—the nose, mouth, and eyes—will be used by two different face recognition algorithms, LBP and HOG, and stored in a database.

[3] VIOLA – JONES ALGORITHM:

The system employs the Eigen face technique for face identification after using the Viola Jones algorithm to identify faces in collected photos. The technique computes and analyses Eigen faces, or faces made up of eigenvectors. To determine the existence and identity of a person (face), the approach additionally compares the Eigen faces.

A. Components:

The suggested work is to be implemented using the MATLAB program. It features a toolset for managing databases as well as images. By using the toolkit and applying the algorithms, it is utilized to identify and detect faces. The MATLAB also provides tools for creating a GUI that fosters interaction. The user may load the photographs using this GUI, and the system will identify the faces and record the attendance against them. Through the GUI, you can see the updated database. The SQL database needed to maintain student attendance is created using the MYSQL workbench. The database has tables with rows and columns.

The SQL query is used to carry out operations on the database, such as adding and removing data. Data for each student is represented in the rows.

B. Process

For attendance purposes, the lecture must snap pictures of the classroom. The system may be loaded with the collected photographs so that it can identify the faces and record the attendance. The date, semester, and topic ID may all be entered using the GUI. These details are added to the database, which is then updated. Following detection, the photographs are cropped and put in the appropriate folders based on the semester selected.

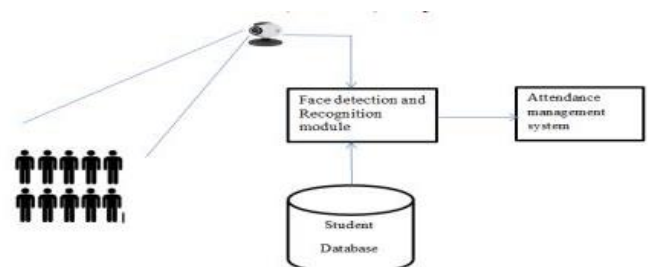


FIG 3: OVERVIEW OF FACE RECOGNITION SYSTEM [11]

The face recognition system's overview is shown in the above graphic. The following are the steps in the recognition process:

The cropped faces are compared to those in the database, first.

ii) If the picture matches, the database's name for the image—which contains the student's roll number—is retrieved.

iii) The attendance is noted for that roll no., and the earlier-provided date is entered in the "Last updated" section.

iv) The GUI allows you to view the updated database.

C. Algorithm:

The phases of the Viola-Jones algorithm are as follows:

1) Haar Feature Selection: Rectangular digital pictures that resemble Haar features may be calculated more quickly than individual pixels. It consists of a class of local traits that are determined by deducting the total of one subregion from the sum of the other subregions.

2) Creating an Integral Picture: In a fixed amount of time, an integral image analyses rectangular features (Haar-like features). The rectangular region of each feature is always bordered by at least one additional rectangle. The total of the pixels above and to the left of (x,y) constitutes the integral picture at that point, and it may be computed in a single pass.

3) Adaboost Training: Using a set of all weighted classifiers, the Adaboost method builds classifiers. The single rectangular feature and threshold that best distinguishes between positive (faces) and negative (non-faces) training should be chosen using Adaboost Training and a cascade classifier.

4) Cascading Classifiers: It includes all of the image's positive areas while removing any negative ones. This speeds the computation and lowers the total positive weights of falls.

D. Eigen Face Recognition:

This method calculates the distances between the eyes, nose, and mouth. Eigen faces are the names for these distinguishing qualities. Through the use of the mathematical technique known as Principal Component Analysis, these characteristics may be retrieved from the original picture data (PCA).

[4] BLOCK DIAGRAM:

The ability to recognize faces has always been crucial. However, if we go through every step, a block diagram may be used to summarize the face detection and identification process.

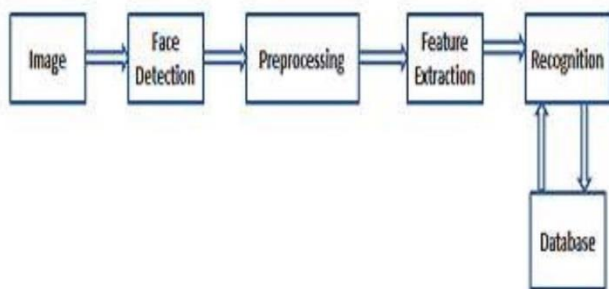


FIG 4: BLOCK DIAGRAM FOR FACE RECOGNITION SYSTEM [18]

Numerous techniques and procedures have been developed to achieve optimal efficiency in response to the challenges facing face detection. The following are the three primary facial recognition methods:

- i. Holistic Approach
- ii. Feature-Based Approach
- iii. Hybrid Approach

1. Holistic Approach: This method considers the entire facial region while attempting to identify faces. They are all based on principle component analysis (PCA) techniques, which may be used to reduce the number of dimensions in a dataset while keeping its original characteristics. Examples include fisherfaces, eigenfaces, and so on.

2. Feature-Based Approach: The distinctive facial characteristics, such as the lips and nose, are segmented and used as input data for detection techniques.

3. Hybrid Strategy: As the name implies, this approach combines techniques that take both the entire face and local characteristics (such as the nose, lips, etc.) into consideration during the recognition process.

4. CONCLUSION

By putting the system into practice, the problems with the current system will be reduced, and the smart connect system will offer a simple, flexible, and easy approach to handle all of the teacher's data inside of a centralized database that can be quickly accessed and readable by higher authorities

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