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FaceID Attendance Automation

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ABSTRACT: The main aim of the Facial Recognition FaceID Attendance Automation is to update and modernize the attendance system. The project aids in computerizing school attendance. Manual roll calls and ID card checks are examples of paper-based attendance methods that are laborious prone to human error and frequently result in erroneous records. These issues will be resolved by the previous system which uses computer face identification software to locate and identify the students faces in real time. The Local Binary Patterns Histograms algorithm ensures that face identification will function under various lighting conditions. The application is more secure than conventional biometric techniques since it also incorporates a liveness check to prevent spoofing with pictures or videos.

KEYWORDS: Facial recognition, Automated attendance, Classroom automation, Digital attendance.

I. INTRODUCTION

The Technology has advanced dramatically in recent years which has changed how educational institutions handle important administrative duties. Traditional attendance procedures such as hand roll calls and ID-based systems are slow prone to error and often distort classroom activities. Maintaining accurate attendance records becomes a significant challenge for the administration and faculty as the count of students increases. These antiquated methods also make it complicate to conduct long-term data analysis which limits the institutions effectiveness.to solve these problems automated faceid attendance have become important. A secure and contactless way to verify students is through facial identification technology which is powered by computer vision and machine learning. Because it is non-intrusive it is highly suitable instantly in classroom setting. A facial identification faceid attendance uses a camera to take pictures of students faces processes them using detection and recognition algorithms and then automatically logs attendance in a database,because its speed ease of use and robust performance in a variety of lighting scenarios the Local Binary Patterns Histograms is especially successful. Liveness detection techniques like motion-based verification and blink recognition help to improve security by preventing spoofing through images or videos.

II. LITERATURE SURVEY

The Numerous researchers have investigated the possibility of automating attendance as universities and other institutions search for quicker and more dependable ways to document student presence. Previous systems relied on RFID cards fingerprint scanners or manual entry but these methods frequently resulted in delays hygienic problems and the possibility of proxy attendance. Many studies started experimenting with facial recognition as a contactless and more reliable alternative as computer vision advanced. In classroom settings research on algorithms such as Haar Cascade LBPH and Eigenface revealed that they could detect and identify faces with a respectable degree of accuracy. Some studies highlighted issues like shifting lighting shifting posture and background noise but later deep learning models assisted in lowering these errors. Numerous authors talked about how OpenCV and Python became popular tools due to their ability to detect faces in real time with little hardware. Other studies looked at how attendance data is managed and stored and they recommended using databases or cloud platforms to improve accessibility. Additionally researchers noted that automated systems save time and lessen human labour during daily roll calls.

III. PROPOSED METHODOLOGY

The proposed solution implements an automated attendance mechanism that identifies students through facial recognition during live classroom sessions. Video input captured by the camera is analyzed to detect faces and verify identities using trained recognition models. To improve reliability, a liveness verification step is applied so that only real individuals are accepted, effectively blocking spoofing attempts involving images or recorded videos. The system provides a simple administrative interface for student enrollment, dataset collection, and model training. Once a valid match is confirmed, attendance is logged automatically without manual intervention. Compared to conventional attendance methods, this approach demonstrates improved efficiency, accuracy, and overall consistency.

By utilizing facial identification technology to automate the entire attendance process the smart attendance system is intended to simplify classroom management. The system uses a camera to continuously monitor and accurately identify students rather than manual roll calls or physical biometric devices. Administrators don't need technical knowledge to add new students; they take sample photos and update the recognition model through the interface. After being trained, the system instantly records attendance when a match is found by processing live video frames in real time. Duplicate entries and erroneous registrations are reduced thanks to built-in data validation. The dashboard offers comprehensive logs that facilitate the tracking of attendance records, training updates, and recognition events. Teachers have access to automatically generated well-structured attendance summaries for each day or session. Additionally, the system design facilitates scalability, making it simple to add more students and classes. The system greatly increases dependability and efficiency by minimizing errors and requiring less human intervention. All things considered, this automated method offers educational institutions looking to update their attendance procedure a quicker, cleaner, and more intelligent solution.

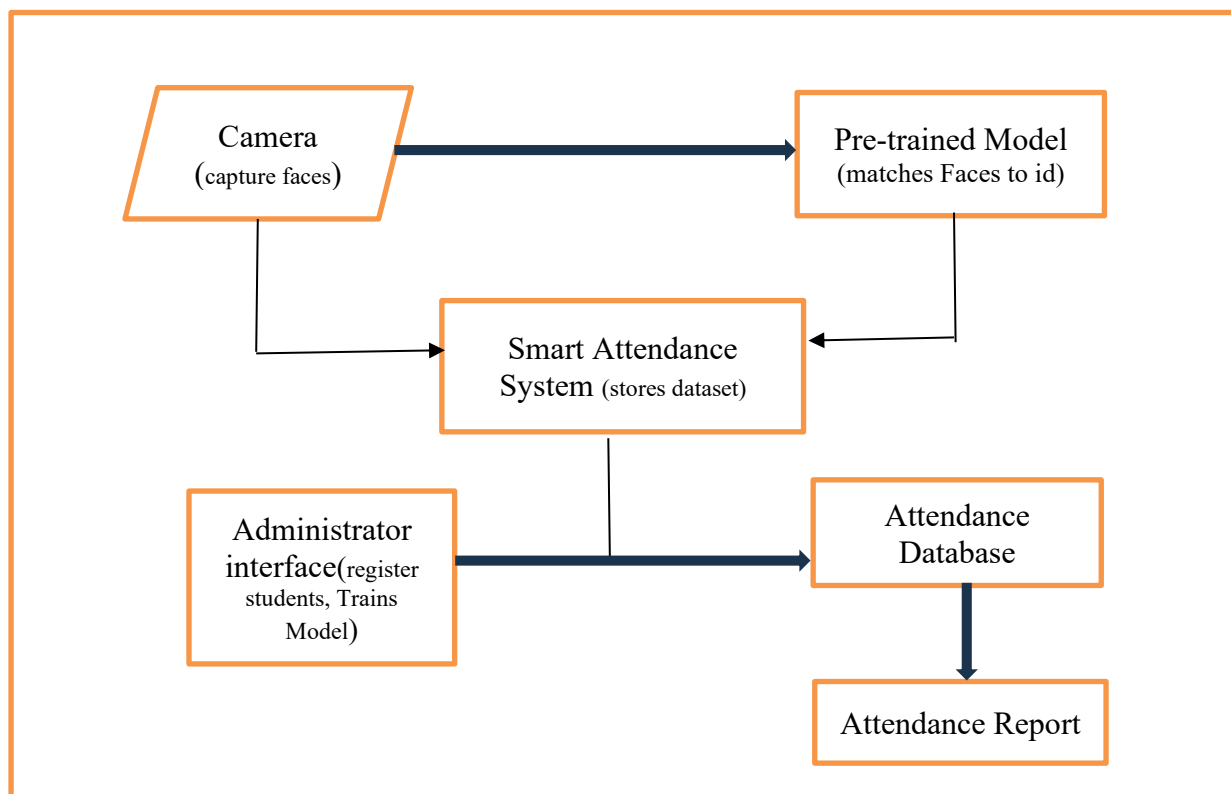


Fig. 1 Data Flow Diagram

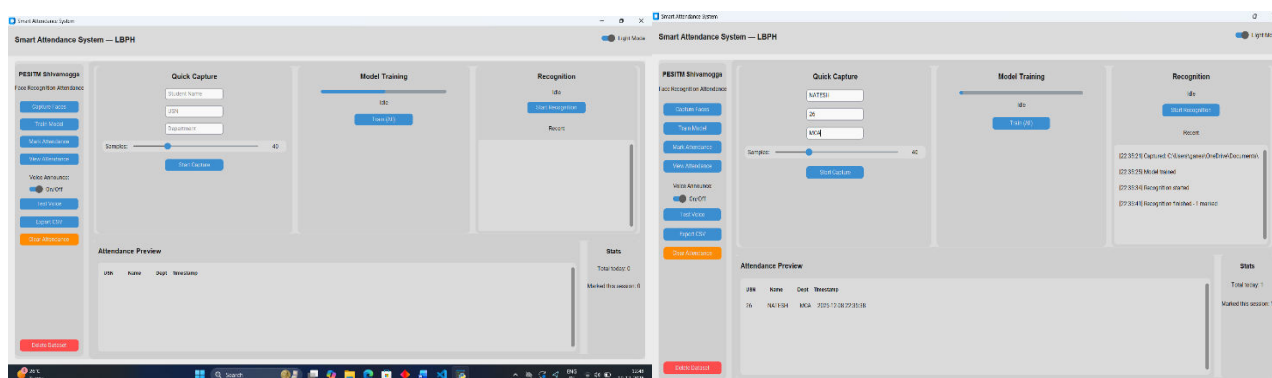
The Smart Attendance System uses facial identification technology to automate the entire attendance process. The workflow starts at the Input Module where student data is gathered including name department and USN. After that this input is sent to the Smart Attendance Engine the systems central processing unit.

Test Cases:

Test Case ID	Description	Input	Expected Output	Result
TC-01	Validate admin login with correct details	Valid username and password	Admin successfully logs in; dashboard displayed	Pass
TC-02	Handle invalid attempts	Wrong username or incorrect password	Error message: <i>"Invalid credentials"</i>	Pass
TC-03	Face detection functionality	Live webcam feed	Face detected and highlighted with bounding box	Pass
TC-04	Recognize registered student	Registered student face	System identifies student and displays their name	Pass
TC-05	Reject unregistered or unknown face	Unknown person face	System shows <i>"Unknown"</i> and does not mark attendance	Pass
TC-06	Liveness detection validation	Blink or natural movement	Liveness confirmed; system proceeds with attendance marking	Pass
TC-07	Attendance logging accuracy	Recognized student details	Timestamp recorded; no duplicate entries within session	Pass
TC-08	Export attendance report	User selects export option	Attendance report generated in CSV/Excel format	Pass

IV. EXPERIMENTAL RESULTS

Through well-organized sections the dashboard offers a easiest interface for users to take pictures train the model and log attendance. Because real-time logs and attendance previews provide instant feedback the system is simple to use and effective on a daily basis.



HOME PAGE

OUTPUT PAGE

The interface of the Smart Attendance System is made to streamline every step of the process from taking pictures to training models and recording attendance. Users can easily and quickly access the necessary features thanks to the dashboards clear division of each section. By gathering pictures and storing information with ease the Quick Capture

panel expedites student registration. In a way to confirm that users are aware of the recognition systems progress the model training module offers status updates.

V. CONCLUSION

This Smart Attendance System which employs facial recognition technology provides a useful means of automating classroom attendance while lowering the workload associated with more conventional approaches. The system can verify student identities without the need for staff supervision at every stage by combining face detection LBPH recognition and a straightforward liveness check. This lowers instances of proxy attendance and helps prevent mistakes that frequently happen with roll calls or ID card scanning. This works well even when students move naturally during class because it processes live video instantaneously. New student registration is made simple by the way datasets are stored and trained which enables to expand to meet the demands of the institution. This is also easy to use for administrators thanks to features like the dashboard view downloadable reports and voice prompts. Even students with little technical experience can easily identify the interface because it is kept simple. The system demonstrated good stability and continued to function well in a variety of lighting and background conditions during testing. All things considered the project is successful in offering a seamless dependable and efficient way to manage attendance in a classroom.

The FaceID Attendance System using facial recognition successfully shows how technology can simplify and improve the way attendance is managed in educational institutions. By replacing manual roll calls and ID-based methods, the system reduces human effort, minimizes errors, and helps prevent proxy attendance. The use of real-time face detection and recognition ensures that attendance is recorded accurately without interrupting classroom activities. Features such as liveness verification, automatic timestamping, and structured data storage make the system both secure and reliable. The user-friendly interface allows administrators and faculty members to operate the system easily, even without advanced technical knowledge. Overall, the project proves to be an effective, time-saving, and dependable solution that meets modern academic requirements and lays a strong foundation for future improvements in automated attendance management.

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