Project Title- “Automated Attendance System Using Face Recognition”

**Abstract**

* **Project Objectives:** In this digital era, face recognition systems play a vital role across multiple sectors, primarily for security, authentication, and identification purposes. Despite having lower accuracy compared to iris and fingerprint recognition, face recognition remains widely used due to its contactless and non-invasive nature. This project aims to develop a class attendance system utilizing face recognition to overcome the limitations of manual attendance marking, such as time consumption and the risk of proxy attendance.
* **Methodology:** The system consists of four key phases: database creation, face detection, face recognition, and attendance updating. Student images are collected to create a database, while face detection is performed using the Haar-Cascade classifier. Recognition is implemented using the Local Binary Pattern Histogram (LBPH) algorithm. The system captures live video streams, detects and recognizes faces, and updates attendance records, which are then emailed to the faculty at the end of the session.
* **Key Findings:** Although many face recognition algorithms exist, achieving an optimal balance between speed and accuracy remains challenging. However, recent advancements, such as Facebook’s face recognition technology, have demonstrated impressive accuracy of up to 98% with minimal training data. The developed system successfully automates attendance marking with improved efficiency and reliability.

**Step wise solution approach-**

**Step 1:** Data Collection and Database Creation

* Capture images of students to create a structured database.

**Step 2:** Face Detection

* Utilize the Haar-Cascade classifier to detect faces in real-time video streams.

**Step 3:** Face Recognition

* Apply the LBPH algorithm to extract unique facial features for identification.

**Step 4:** Attendance Updating

* Compare detected faces with the database, mark attendance, and send reports to faculty.

**Step 5:** System Optimization and Accuracy Improvement

* Improve recognition accuracy by refining training data and algorithm parameters.

**Reference:**

[1] Smitha, & Hegde, Pavithra & Afshin,. (2020). Face Recognition based Attendance Management System. International Journal of Engineering Research and. V9. 10.17577/IJERTV9IS050861.

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