

ONLINE STUDENT ATTENDANCE SYSTEM

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Abstract : - The Online Student Attendance System by Facial Scan is a cutting-edge project that leverages facial recognition technology to streamline the process of recording student attendance in educational institutions. Traditional methods of taking attendance are often time-consuming, prone to errors, and lack real-time tracking capabilities. This project offers a modern solution to these challenges by implementing a secure and efficient system that automates the attendance recording process. The proposed system uses advanced facial recognition algorithms to identify and authenticate students as they enter a classroom or any designated attendance location. By scanning their faces, the system not only ensures that the correct student is present but also records the attendance in real-time, making it instantly accessible to authorized personnel. Moreover, the system maintains a comprehensive attendance database, allowing for easy monitoring and analysis of attendance patterns and trends.

Keywords — Automated attendance recording, Attendance database management, Attendance patterns analysis, Educational institutions, Facial recognition technology, Facial scan authentication, Modern attendance solution, Real-time attendance tracking

I. INTRODUCTION

In the modern age of technology, educational institutions are constantly seeking ways to streamline administrative processes, enhance security, and improve the overall quality of education. One essential aspect of this endeavor is the accurate and efficient tracking of student attendance. Traditional methods of taking attendance, often reliant on manual processes, magnetic cards, or RFID-based systems, are fraught with inefficiencies and vulnerabilities, including proxy attendance, inaccuracy, and a heavy administrative burden. The proposed system takes advantage of the rapid advancements in biometric authentication and computer vision to revolutionize the way student attendance is recorded and monitored. By implementing facial recognition technology, the project offers a solution that promises to eliminate proxy attendance, automate the tracking process, and enhance the accuracy and security of attendance data. In this project, we will delve into the development and implementation of the Online Student Attendance System by facial scan, exploring the technologies and methodologies used, as well as the potential benefits and challenges associated with its adoption. This system holds the promise of transforming attendance tracking in educational settings and ushering in a new era of efficiency and accountability. The project

endeavors to address the existing issues with the conventional attendance tracking system and introduce a modern, robust, and secure solution that aligns with the evolving needs of educational institutions in the digital age.

II. LITERATURE REVIEW

In [1] IOT Based Cloud Integrated Smart Classroom and Sustainable Campus [2021] This paper proposed an idea of recording attendance using face recognition technique and storing the data using IoT. In this method arduino uno is used as a microcontroller. Cameras are used to detect the face of an individual or group of pupils. Based on the information that is stored in prior, the faces are recognized and the attendance is recorded and the database is obtained. This method provides better results in short span of time but fails to produce most accurate results. There are some chances of some errors.

In [2] Attendance Management System through Fingerprint [2018] This paper proposed an idea of recording attendance using biometrics (fingerprint) for tracking attendance and storing the data using LAN. This paper provides a brief description about the usage, accessibility, accuracy, affordability and acceptance of biometric (fingerprint verification) system. In this system the data is fetched from the individual in the form of fingerprint and then it is verified

with the data that was stored in prior and marks the attendance of an individual. Finally the database is also obtained. This method provides high accuracy results and consumes less time but it is not cost-effective.

In [3] Efficient access control system based on aesthetic QR code [2018] The idea of granting access based on QR code detection is proposed. In this method the QR code will be checked and if it matches with the stored data then the access is provided for the user or else the access will be denied. This method is well suitable for residential purpose and provides better safety and security. In this method the database is not collected and it is less secure than other modern methods. In [4] Student attendance system in classroom using face recognition technique [2016] Here this paper gives an idea of recording attendance using face recognition technique. Also this paper provides a detailed description about the results and its analysis obtained from this method. Faces are recognized using cameras and the verification is done. Then the attendance is marked. This method is suitable only for moderate number of people and the results obtained are nearly 87.

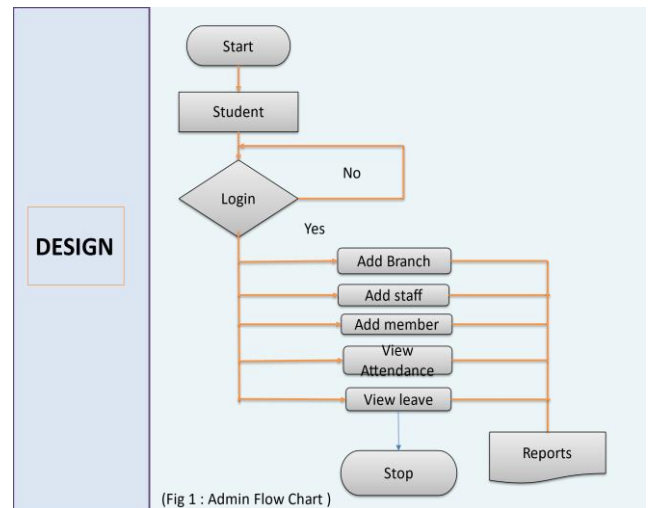
III. METHODOLOGY

Fingerprint Biometrics:

Method: This paper suggests attendance tracking using biometrics (fingerprint) and data storage using LAN. The system captures individual fingerprints, verifies them against stored data, and records attendance. **Outcome:** This method offers high accuracy and efficiency but is not cost-effective.

Efficient Access Control System Based on Aesthetic QR Code [2018] - QR Code Detection: **Method:** This paper introduces an access control system based on QR code detection. Access is granted if the QR code matches stored data. It is suitable for residential use, enhancing safety and security. **Outcome:** While suitable for residential purposes, it is less secure compared to modern methods, and it doesn't collect a database.

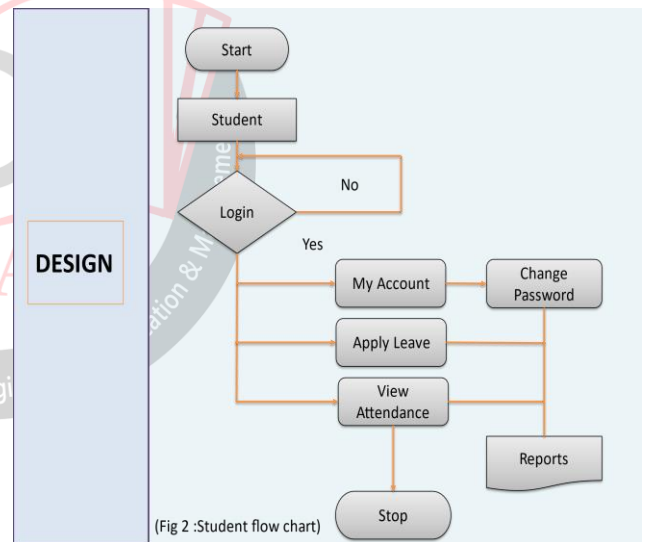
Student Attendance System in Classroom Using Face Recognition Technique [2016] - Face Recognition: **Method:** This paper focuses on recording attendance through face recognition using cameras. Faces are recognized, and attendance is marked. The method works well for a moderate number of people with an accuracy rate of around 87. **Outcome:** It is suitable for moderate-sized groups but has limitations in recognizing a large number of individuals, potentially leading to errors in results.



(Fig 1 : Admin Flow Chart)

Fig 1 : Admin Flow Chart

This paper proposes recording attendance using the face recognition technique, with data storage using IoT. Arduino Uno is used as the microcontroller. Cameras detect faces, recognize them based on stored information, and record attendance in a database. **Outcome:** The method provides quick results but may lack accuracy and may have some chances of errors. Attendance Management System through Fingerprint [2018]



(Fig 2 :Student flow chart)

Fig 2 : Student Flow Chart

Methodology for implementing the Online Student Attendance System by Facial Scan:

1. System Design and Architecture:
 - Develop a comprehensive system design outlining the architecture, components, and interactions required for the facial recognition attendance system.
 - Determine the hardware and software requirements, including cameras for facial scanning, databases for storing attendance records, and algorithms for facial

recognition.

2. Data Collection and Preprocessing:

- a dataset of facial images representing enrolled students.
- Preprocess the facial images to enhance quality, standardize dimensions, and remove noise or distortions.

2. Facial Recognition Algorithm Implementation:

- Select and implement suitable facial recognition algorithms, such as deep learning-based models like Convolutional Neural Networks (CNNs) or traditional methods like Principal Component Analysis (PCA) or Local Binary Patterns (LBP).
- Train the chosen model using the preprocessed dataset to recognize and authenticate students' faces accurately.

4. System Integration:

- Integrate the facial recognition module with the attendance recording system, ensuring seamless communication and data exchange between components.
- Develop user interfaces for administrators and teachers to interact with the system, allowing them to view attendance records, manage settings, and generate reports.

5. Testing and Validation:

- Conduct extensive testing to evaluate the accuracy, reliability, and performance of the facial recognition system under various conditions, such as different lighting conditions, facial orientations, and environmental factors.
- Validate the system's effectiveness by comparing its performance against traditional attendance methods and assessing its ability to accurately identify and record student attendance in real-time.

6. Deployment and Implementation:

- Deploy the facial recognition attendance system in educational institutions, including classrooms, lecture halls, or other designated attendance locations.
- Provide training and support to administrators, teachers, and staff members on how to use the system effectively and address any issues or concerns that may arise during implementation.

7. Maintenance and Optimization:

- Establish protocols for regular system maintenance,

including software updates, database backups, and hardware maintenance to ensure the system operates smoothly and securely.

- Continuously monitor and optimize the system performance based on feedback, usage patterns, and evolving technological advancements to enhance its efficiency and reliability over time.

By following this methodology, educational institutions can successfully implement the Online Student Attendance System by Facial Scan, providing a modern and efficient solution for recording student attendance.

IV. SYSTEM PROTOTYPE

FEATURES OF APP:

The Online Student Attendance System is a web-based application designed to manage and maintain the records of student attendance in educational institutions. The system is user-friendly and simple, catering to two main users: the admin and the teacher. The admin has all rights to view or access system data, while the teacher has rights to view only his or her grade student data. The system stores student daily attendance records and generates PDF reports from attendance data. The system's main feature is its ability to store student daily attendance records and generate PDF reports from attendance data. The system has two main users: the admin and the teacher. The admin has all rights to view or access system data, while the teacher has rights to view only his or her grade student data. The system stores student daily attendance records and generates PDF reports from attendance data. The system prototype can be developed using various technologies, including PHP, MySQL, jQuery, Ajax, Bootstrap 4, jQuery Datatable plugin, and Bootstrap Datepicker plugin. The system's user interface can be designed using Bootstrap 4, which is a responsive front-end framework that ensures the system's compatibility with any device. The system prototype can be developed in three main modules: the server module, the Bluetooth station module, and the client module. The server module is responsible for managing the system's database and providing access to data for the client module. The Bluetooth station module is responsible for collecting student information using an RFID reader and sending it to the server module. The client module is responsible for displaying student attendance data to the user. The system prototype can be tested using a sample of students and teachers to ensure that it meets the desired requirements. The system's performance, security, and usability can be evaluated during the testing phase. The system prototype can be improved based on the feedback received during the testing phase. In conclusion, the Online Student Attendance System prototype can be developed using various technologies, including PHP, MySQL, jQuery, Ajax, Bootstrap 4, jQuery Data table plugin, and Bootstrap Date picker plugin. The system prototype can be tested using a sample of students and teachers to ensure that it meets the

desired requirements. The system prototype can be improved based on the feedback received during the testing phase, making it a valuable tool for educational institutions.

APP DESIGN: -



Figure 1

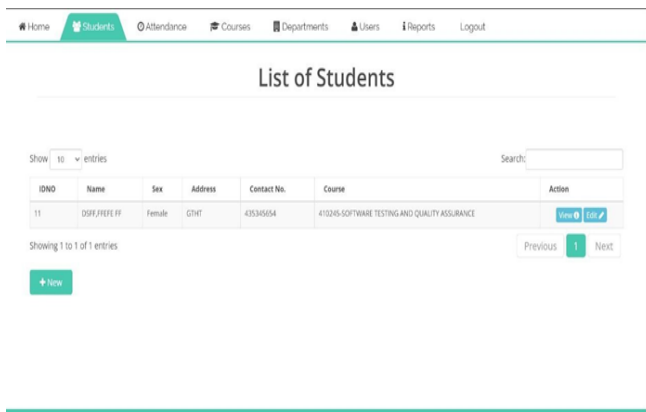


Figure 2

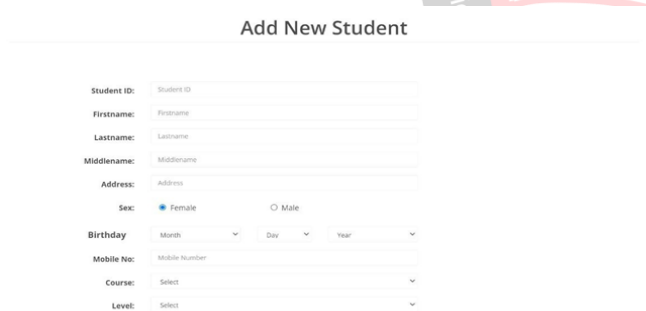


Figure 3

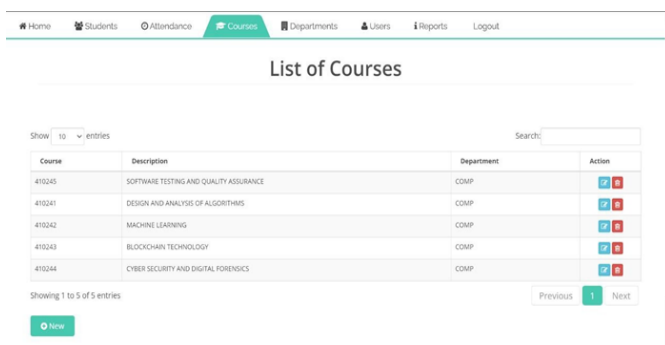


Figure 4

V. CONCLUSION

In conclusion, the development and implementation of the Online Student Attendance System by Facial Scan represent a significant step forward in enhancing attendance tracking and management within educational institutions. This project’s core objective was to introduce an innovative and efficient solution to the age-old challenge of attendance recording. Throughout the project, we encountered various methodologies

and technologies that have paved the way for improved attendance management. By leveraging facial recognition technology, our system addresses the limitations of traditional manual attendance recording methods. It offers real-time attendance tracking, reduces the likelihood of proxy attendance, and provides a seamless experience for students, teachers, and administrators. The ability to mark attendance with facial recognition not only streamlines the process but also significantly enhances data accuracy and reliability. In summary, the Online Student Attendance System by Facial Scan is a substantial step toward modernizing attendance management in educational institutions. While it offers numerous advantages, it also presents opportunities for ongoing improvement and fine-tuning. With a commitment to addressing these challenges and a focus on user satisfaction, we believe this system has the potential to revolutionize attendance tracking and significantly improve the educational experience for all stakeholders involved.

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REFERENCES

- [1] Jain, U., Joshi, and B. K. Sharma. "Attendance Management System." Masters Project Report, Rajasthan Technical University, Kota. Available at: http://junikhyatjournal.in/no_1 Online_21/50.pdf
- [2] "5 Best Attendance Systems with Face Recognition." Buddy Punch. Available at: <https://buddypunch.com/blog/attendance-system-face-recognition/>
- [3] "Student Attendance Management System PDF."

- Scribd. Available at: <https://www.scribd.com/doc/309682634/Student-Attendance-Management-System>
- [4] MyAttendanceTracker.com. "Track, and Report Attendance Online!" Available at: <https://www.myattendancetracker.com>
- [5] Grafiati. "Bibliographies: 'Articulated System of Student Attendance'." Available at: <https://www.grafiati.com/en/literature-selections/articulated-system-of-student-attendance/>
- [6] Abdullah, Hamsa, Israa A. Mohson, and Ether S. Mohamad Ali. "Student Attendance Management System." *i-manager's Journal on Information Technology* 4, no. 2 (May 15, 2015): 7–12. Available at: <http://dx.doi.org/10.26634/jit.4.2.3387>
- [7] LakshmiSudha, K., Shirish Shinde, Titus Thomas, and Aris Abdugani. "Barcode based Student Attendance System." *International Journal of Computer Applications* 119, no. 2 (June 18, 2015): 1–5. Available at: <http://dx.doi.org/10.5120/21036-3147>
- [8] Singh, Monika, Divya Tripathi, Ashutosh Pandey, and Rakesh Kumar. "Mobile based Student Attendance Management System." *International Journal of Computer Applications* 165, no. 3 (May 17, 2017): 37–40. Available at: <http://dx.doi.org/10.5120/ijca2017913834>
- [9] Mohammed, Khaled, A. S. Tolba, and Mohammed Elmogy. "Multimodal student attendance management system (MSAMS)." *Ain Shams Engineering Journal* 9, no. 4 (December 2018): 2917–29. Available at: <http://dx.doi.org/10.1016/j.asej.2018.08.002>
- [10] Bhatambrekar, Shubhangi, Sonal Kulkarni, Savita Mohurle, Pranav Kumar, Shashank Naik, and Shrikant Pokale. "Student attendance system (SAS)-RFID-based application." In *International Conference on Industrial Electronics and Engineering*. Southampton, UK: WIT Press, 2014. Available at: <http://dx.doi.org/10.2495/iciee140441>