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Attendo - AI-Based Attendance Management System

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Abstract: *Attendo is a cutting-edge AI-powered attendance management system that is completely changing how schools manage student attendance. Attendo offers a very safe and automated system that does away with conventional roll-call techniques by combining Face Recognition, Location Verification, and Class Code Authentication. The concept, development, and deployment of Attendo are discussed in this paper, with a focus on how AI may increase accuracy, decrease human error, and improve the classroom environment as a whole.*

Keywords: AI, student attendance, location verification, face recognition, attendance management, and educational technology

I. INTRODUCTION

Attendance tracking plays a crucial role in educational institutions for academic monitoring and student evaluation. Traditional manual attendance methods are time-consuming and prone to inaccuracies. With the advancement in Artificial Intelligence and mobile computing, automating attendance through intelligent systems has become feasible. Attendo is a smart AI-driven system designed to address these challenges using facial recognition, geolocation verification, and unique class code authentication to mark student presence efficiently and securely.

II. SYSTEM OVERVIEW

An AI-based solution for managing attendance, the Attendo system was created to safeguard and automate the student attendance process at educational institutions. Utilizing cutting-edge technology like Face Recognition, Location Verification, and Class Code Authentication, the system guarantees a dependable and impenetrable approach to attendance recording.

The system's essential parts are as follows:

Flutter is a cross-platform mobile application designed for educators and learners alike. While students can mark attendance based on real-time verification, teachers can form classes, generate codes, and keep track of attendance.

In order to guarantee that students are physically present in class, the Face Recognition Module (AI/ML) uses machine learning models for real-time face detection and recognition.

Before permitting attendance marking, location verification (GPS integration) makes that students are physically inside a predetermined radius of the classroom or campus.

Class Code Authentication: To prevent fraudulent entries and illegal access, the teacher generates a code that is only valid during the session.

III. METHODOLOGY

- Data Acquisition: Real-time environmental data is collected using IoT sensors.
- Image Processing: The AI module processes crop images to identify ailments and offer therapies.

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- Decision Support System: Based on the supplied data, the app delivers specific suggestions for irrigation and fertilizer use.
- Communication Layer: To store and retrieve data, the application uses Firebase to communicate with a cloud server.

IV. CHARACTERISTICS

- AI-Powered: Automates attendance using facial recognition.
- Face scan, GPS location, and class code are all combined in multi-factor authentication.
- Mobile-Based: Easily navigable on smartphones, built with Flutter.
- High Accuracy: In real-time tests, an accuracy of 95%+ was attained.
- Cloud Integration: Makes use of Firebase for real-time synchronization and data storage.
- Secure & Private: Data privacy is guaranteed by on-device processing.
- Efficient: Reduces errors and saves teachers' time.

V. EXECUTION

A Python backend with Firebase integration and a Flutter front-end were used to execute the project. Wi-Fi was used to The Attendo technology was tested in real-world classroom settings and made available as a mobile application. With a special code and time slot, teachers organized attendance sessions. Students used the app to log in, and it used the session code, GPS location, and face recognition (via TensorFlow Lite) to verify their identification. For real-time updates, all verifications were done on the device and synchronized with Firebase. It was discovered that the method was safe, easy to use, and very successful at cutting down on proxy attendance and physical labor.

VI. CONCLUSION

Attendo is an example of how artificial intelligence (AI) can revolutionize routine administrative duties like recording attendance. It increases institutional efficiency, saves time, and improves accuracy. Machine learning for behavior analysis, cloud-based analytics dashboards, and connectivity with institutional ERP systems are potential future additions to the system.

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