AI-POWERED FACE RECOGNITION FOR ATTENDANCE, ANALYTICS AND AUTOMATED PERSONALIZED FEEDBACK EMAILS

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ABSTRACT

Accurate attendance management is essential for maintaining student accountability and ensuring effective academic administration in educational institutions. Traditional methods, such as manual roll calls and sign-in sheets, are time-consuming, prone to errors, and susceptible to proxy attendance. To overcome these challenges, we propose an advanced smart attendance system that utilizes face recognition technology powered by OpenCV and the FaceNet algorithm for high-precision identification. The system captures real-time images of individuals entering the classroom and processes these images to verify their identities against a pre-registered database. By leveraging deep learning models, particularly FaceNet, the system ensures high accuracy and minimizes the risk of misidentifications. Attendance data is recorded in a CSV file for seamless integration with existing academic management systems, facilitating easy storage and retrieval of attendance records.A standout feature of the system is its user-friendly interface, which enables real-time monitoring, generates detailed reports and provides insightful analytics on student participation patterns. To further enhance engagement and accountability, the system automatically sends email notifications to absentee students, ensuring timely communication and encouraging consistent attendance. Experimental evaluations validate the system's high performance under various lighting conditions and angles, demonstrating its robustness and reliability. The system is designed for scalability and efficiency, making it adaptable for institutions of varying sizes. By automating the attendance process and reducing manual workload, this system enhances the overall efficiency and accuracy of attendance management. Through the integration of artificial intelligence, deep learning, and computer vision technologies, this innovative solution transforms traditional attendance management into a secure, accurate, and automated system, offering a scalable and efficient alternative for educational and workplace environments.

KEYWORDS: *Smart Attendance System, Face Recognition, Opencv, Facenet Algorithm, CSV Record Storage, Email Notification, Deep Learning.*

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