DEVELOPMENT AND EVALUATION OF AN AUTOMATED STUDENT ATTENDANCE TRACKING SYSTEM USING FACIAL RECOGNITION TECHNOLOGY

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Abstract: Face recognition technology has become a critical tool in image processing, offering innovative solutions for automation in various fields. This research presents the development of an automated student attendance tracking system using facial recognition to address inefficiencies in traditional attendance methods. Conventional systems, such as roll calls and manual record-keeping, are time-consuming and prone to human error and manipulation, including proxy attendance. The proposed solution aims to digitize and streamline the attendance process, reducing administrative burdens and improving accuracy. The system utilizes Haar Cascade classifiers for face detection and a K-Nearest Neighbors (KNN) algorithm for facial recognition. Real-time video is captured through a webcam, allowing the system to detect and recognize students. Once recognized, the system automatically logs attendance and generates reports in CSV format, facilitating easy data management. To enhance user experience, the system also features text-to-speech feedback, providing audio confirmation for each recognized student. By eliminating manual intervention, the system ensures accurate and reliable attendance records, significantly reducing errors and improving data integrity. Its intuitive interface allows both students and educators to navigate the system effortlessly. Additionally, the solution is cost-effective and requires minimal installation effort, making it practical and feasible for widespread adoption. This approach not only modernizes attendance tracking but also minimizes human effort, offering a robust and efficient alternative to traditional methods. The system demonstrates the potential to transform how attendance is managed in educational institutions, addressing challenges such as time consumption and error-prone data entry with a scalable, automated solution.

Keywords: Automated Attendance, Face Recognition, Biometric Authentication.