

ABSTRACT

Student attendance systems often use manual or semi-manual methods, which are prone to recording errors and misuse. This can be detrimental to the evaluation process and academic data management, as well as reducing the effectiveness of lecture time. Facial recognition technology emerges as a potential solution to the problem, as it is able to uniquely identify individuals based on facial feature characteristics and supports automatic and real-time attendance recording.

This research uses a system development method based on Google ML Kit and FaceNet for the implementation of face recognition technology, with the integration of Firebase Realtime Database as a data storage medium. The data used includes student information, course schedules, and attendance records. Tests were conducted through simulations on Android Studio-based applications to measure the level of accuracy, processing speed, and user experience of the developed system.

Based on the analysis of the test results, the face recognition system shows 100% accuracy at a distance of 50 cm, 100 cm, and 150 cm, although the image quality decreases with greater distance. The face recognition time increased from 1.328 seconds at a distance of 50 cm to 1.963 seconds at a distance of 150 cm. Testing in bright lighting showed faster recognition time, while in dark conditions, accuracy decreased. The use of a hat reduced the accuracy to 93.75%, and the use of a hat and glasses together reduced the accuracy to 78.75%. Testing with facial objects outside the database resulted in only one unauthorized person being legitimately recognized by the system and showed a False Acceptance Rate (FAR) value of 10%. The UI survey showed high satisfaction scores, with the highest score of 4.2 for "Course Input". Application performance testing showed improved performance with 63% faster start times, although there was an increase in duration in some processes, such as data submission and login, which requires attention to improve user experience. additional attributes, in order to be implemented more effectively and reliably.

Keywords: Face Recognition, Google ML Kit FaceNet, Firebase Realtime Database, Attendance System