

ABSTRAK

PENERAPAN METODE MTCNN DAN ARCFACE PADA SISTEM PRESENSI SISWA BERBASIS *GEOFENCING* DENGAN NOTIFIKASI WHATSAPP

(2026: xvii + 96 halaman + 49 gambar + 9 tabel + 11 lampiran)

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Abstrak—Sistem presensi siswa yang masih dilakukan secara manual memiliki berbagai keterbatasan, seperti proses pencatatan yang kurang efisien, berpotensi terjadinya titip absen, serta belum mampu memberikan informasi kehadiran secara langsung kepada orang tua. Untuk mengatasi permasalahan tersebut, penelitian ini mengembangkan sistem presensi siswa berbasis pengenalan wajah menggunakan metode Multi-task Cascaded Convolutional Neural Network (MTCNN) dan ArcFace yang dipadukan dengan *Geofencing* serta notifikasi WhatsApp Gateway. Hasil pengujian menunjukkan bahwa metode MTCNN memperoleh *Detection rate* sebesar 98,83%, sedangkan ArcFace menghasilkan Accuracy sebesar 90,16% pada nilai *threshold* 0,39. Selain itu, sistem berhasil memvalidasi lokasi presensi sesuai radius yang ditentukan serta mengirimkan notifikasi kehadiran beserta foto bukti presensi kepada orang tua secara otomatis melalui WhatsApp. Berdasarkan hasil tersebut, sistem mampu bekerja dengan baik dalam melakukan presensi siswa secara otomatis, akurat, dan terintegrasi sehingga dapat meningkatkan efisiensi pencatatan kehadiran serta meminimalkan potensi titip absen.

Kata Kunci: Sistem Presensi, MTCNN, ArcFace, *Geofencing*, WhatsApp Gateway

ABSTRACT

IMPLEMENTAION OF MTCNN AND ARCFACE METHODS IN A STUDENT ATTENDANCE SYSTEM BASED ON *GEOFENCING* WITH WHATSAPP NOTIFICATIONS

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Abstract—Student attendance systems that are still conducted manually have several limitations, including inefficient attendance recording, the potential for proxy attendance, and the inability to provide real-time attendance information to parents. To address these issues, this study developed a web-based student attendance system using the Multi-task Cascaded Convolutional Neural Network (MTCNN) and ArcFace methods, integrated with *Geofencing* and WhatsApp Gateway notifications. The experimental results showed that the MTCNN method achieved a *Detection rate* of 98.83%, while ArcFace achieved an Accuracy of 90.16% at a 0.39 *threshold*. In addition, the system successfully validated users' locations based on the predefined *geofencing* radius and automatically sent attendance notifications along with attendance photo evidence to parents via WhatsApp. Based on the obtained results, the proposed system was able to perform student attendance automatically, accurately, and in an integrated manner, thereby improving attendance recording efficiency and reducing the potential for proxy attendance.

Keywords: Student Attendance System, MTCNN, ArcFace, *Geofencing*, WhatsApp Gateway