

ABSTRAK

Chairuniesya Viorenancy Cendy Esfranca. 2026. Rancang Bangun Sistem Absensi Siswa SMPN 3 Paron Dengan Teknologi *Geofencing* Dan Fitur Monitoring Orang Tua *Real-Time*. Skripsi. Program Studi Teknik Informatika, FT, Universitas PGRI Madiun. Pembimbing (I) Puguh Jayadi, S.Kom., M.Kom. (II) Alim Citra Aria Bima, S.Pd., M.Kom.

Sistem absensi di SMPN 3 Paron masih dilakukan secara manual sehingga proses pencatatan dan rekapitulasi kehadiran kurang efektif, berisiko terjadi kesalahan, serta belum menyediakan informasi kehadiran siswa secara real-time kepada orang tua. Penelitian ini bertujuan membangun sistem absensi siswa berbasis *Geofencing* dengan *Algoritma Ray Casting* yang dilengkapi fitur monitoring kehadiran orang tua secara *real-time*. Metode yang digunakan adalah Prototype, sedangkan pengembangan sistem menggunakan Laravel, SQLite serta teknologi *Geofencing* yang menerapkan *Algoritma Ray Casting* untuk memvalidasi lokasi absensi berdasarkan area sekolah. Sistem menyediakan fitur absensi berbasis lokasi dan foto selfie, pengajuan izin dan validasi kehadiran serta monitoring kehadiran oleh wali murid. Hasil penelitian menunjukkan bahwa sistem berhasil dibangun sesuai kebutuhan pengguna, mampu memvalidasi lokasi absensi berdasarkan area geofencing, mempermudah pengelolaan kehadiran siswa serta memberikan informasi kehadiran kepada orang tua secara real-time. Pengujian dilakukan menggunakan *Black Box Testing* dan *System Usability Scale* (SUS) untuk memastikan sistem berfungsi dengan baik dan mudah digunakan.

Kata kunci: Sistem Absensi, Geofencing, Algoritma Ray Casting, Laravel, Prototype, Monitoring Real-Time.

ABSTRACT

Chairuniesya Viorenancy Cendy Esfranca. 2026. Design and Development of a Student Attendance System for SMPN 3 Paron Using Geofencing Technology and Real-Time Parent Monitoring Features. Undergraduate Thesis. Informatics Engineering Study Program, Faculty of Engineering, Universitas PGRI Madiun. Supervisor I: Puguh Jayadi, S.Kom., M.Kom. Supervisor II: Alim Citra Aria Bima, S.Pd., M.Kom.

The student attendance system at SMPN 3 Paron is still carried out manually, making the attendance recording and recapitulation process less effective, prone to errors, and unable to provide real-time attendance information to parents. This study aims to develop a student attendance system based on Geofencing with the Ray Casting Algorithm, equipped with a real-time attendance monitoring feature for parents. The system was developed using the Prototype method, while Laravel and SQLite were utilized as the development tools. The Geofencing technology was implemented using the Ray Casting Algorithm to validate students' attendance locations based on the school's designated area. The system provides location-based attendance with selfie verification, leave request submission, attendance validation, and real-time attendance monitoring for parents. The results show that the developed system meets user requirements, accurately validates attendance locations based on the geofencing area, simplifies attendance management, and provides real-time attendance information to parents. System evaluation was conducted using Black Box Testing and the System Usability Scale (SUS), demonstrating that the system functions properly and is easy to use.

Keywords: *Student Attendance System, Geofencing, Ray Casting Algorithm, Laravel, Prototype, Real-Time Monitoring.*