

**SHRI G.S. INSTITUTE OF TECHNOLOGY &
SCIENCE, INDORE DEPARTMENT OF COMPUTER
ENGINEERING**



Attendance Tracker

2024-2025

SUBMITTED TO:

Ms. Mamta Gupta

Ms. Ashivini Pahade

SUBMITTED BY:

Purvi Porwal(0801CS221114)

1. Introduction.....	2
1.1 Objective.....	2
1.2 Intended Audience and Reading Suggestions.....	2
1.3 Product Scope.....	2
1.4 References.....	2
2. Overall Description.....	2
2.1 Product Perspective.....	2
2.2 Product Function.....	3
2.3 User Classes and Characteristics.....	3
2.4 Operating Environment.....	3
2.5 Design and Implementation Constraints.....	3
2.6 Dependencies.....	3
3. External Interface Requirements.....	3
3.1 User Interfaces.....	3
3.2 Software Interfaces.....	4
4. System Features.....	4
4.1.1 Description and Priority.....	4
4.1.2 Input/Output Sequences.....	4
4.1.3 Functional Requirements.....	4
4.2 Attendance Marking.....	5
4.2.1 Description and Priority.....	5
4.2.2 Input/Output Sequences.....	5
4.2.3 Functional Requirements.....	5
4.3 Admin Management.....	5
4.3.1 Description and Priority.....	5
4.3.2 Input/Output Sequences.....	5
4.3.3 Functional Requirements.....	6
4.4 Geolocation Verification.....	6
4.4.1 Description and Priority.....	6
4.4.2 Input/Output Sequences.....	6
4.4.3 Functional Requirements.....	6
5. Other Nonfunctional Requirements.....	6
5.1 Performance Requirements.....	6
5.2 Software Quality Attributes.....	7

1. Introduction

1.1 Objective

This document outlines the software requirements for the Attendance Tracker application, which uses facial recognition and geolocation to help users mark their attendance. It covers the first release of the software, focusing on the key features like user registration, attendance marking, and admin management.

1.2 Intended Audience and Reading Suggestions

- Users and Admins: To understand the system's functionalities.
- Developers: To understand the functional and non-functional requirements.

1.3 Product Scope

The Attendance Tracker application allows users to mark their attendance using facial recognition and ensures they are physically present in a specific location using geolocation. It aims to reduce false attendance and streamline attendance tracking for educational institutions.

1.4 References

This document references online materials for geolocation APIs and facial recognition libraries.

For more details, refer to the following:

- Geolocation API
Documentation(https://developer.mozilla.org/en-US/docs/Web/API/Geolocation_API)
- Face Recognition Library
Documentation(<https://github.com/justadudewhohacks/face-api.js>)

2. Overall Description

2.1 Product Perspective

The Attendance Tracker is a new standalone application aimed at replacing manual attendance systems. It uses a combination of facial recognition and geolocation technologies to verify users' presence.

2.2 Product Functions

The main functions include:

- **User Registration:** Allows users to sign up using their email, password, and facial data.
- **Attendance Marking:** Users can mark their attendance with facial recognition and location verification.
- **Admin Management:** Admins can manage rooms and view attendance logs.

2.3 User Classes and Characteristics

- **Students:** Mark their attendance using facial recognition.
- **Admins:** Manage rooms and monitor attendance logs.

2.4 Operating Environment

The application will run on any modern web browser and is compatible with desktop and mobile devices. It requires access to a camera for facial recognition and GPS for geolocation.

2.5 Design and Implementation Constraints

Geolocation API: The application will use existing APIs for location verification.

Face Recognition Library: Facial data will be captured using open-source face recognition tools.

Browser Requirements: The app needs access to the camera and location services, which may vary across browsers.

2.6 Dependencies

The system assumes users have a working camera and GPS-enabled device.

The app depends on third-party geolocation and facial recognition services for core functionality.

3. External Interface Requirements

3.1 User Interfaces

Login/Register Page: Users input email, password, and face descriptor. The interface will have a form for facial recognition data capture and standard fields for email and password.

Attendance Marking: A page where users verify their face and location, featuring a "Mark Attendance" button and status confirmation.

Admin Dashboard: Allows admins to view attendance logs, manage rooms, and add geolocation data. This will include tables, maps for geolocation, and CRUD operations for room management.

3.2 Software Interfaces

Geolocation API: Provides location data for validating user presence.

Facial Recognition Library: Interfaces with the application to process and compare facial descriptors.

PostgreSQL: Used to store user, attendance, and room data.

4. System Features

4.1 User Registration and Authentication

4.1.1 Description and Priority

This feature allows users to register and authenticate their attendance using facial recognition, phone number and email. The system ensures that only legitimate users can register and log in.

Priority: High

4.1.2 Input/Output Sequences

- **Input:** The user provides their email, password, and face descriptor during registration.
 - **Output:** The system stores user details and returns a registration success message.
- **Input:** The user logs in by providing their email, password, and face descriptor.
 - **Output:** The system validates the face descriptor against stored data, and upon successful match, logs the user in.

4.1.3 Functional Requirements

- **REQ-1:** The system must store the user's face descriptor in the database during registration.
- **REQ-2:** The system must validate the face descriptor during login to authenticate users.

- **REQ-3:** The system must return a success message on successful registration or login.
- **REQ-4:** The system must return an error message if the face descriptor does not match.

4.2 Attendance Marking

4.2.1 Description and Priority

This feature enables users to mark their attendance using facial recognition and geolocation verification. It ensures that the user is physically present in the designated room before attendance is recorded.

Priority: High

4.2.2 Input/Output Sequences

- **Input:** The user requests to mark attendance by providing their face descriptor and current geolocation.
 - **Output:** The system validates the user's geolocation and face descriptor and marks attendance if the user is in the correct location.

4.2.3 Functional Requirements

- **REQ-1:** The system must capture and validate the user's current geolocation against the predefined room location.
- **REQ-2:** The system must match the face descriptor with the stored data to confirm the user's identity.
- **REQ-3:** The system must prevent multiple attendance entries within one hour using rate limiting.
- **REQ-4:** The system must send a confirmation message after successful attendance marking.

4.3 Admin Management

4.3.1 Description and Priority

This feature allows administrators to manage rooms and view attendance logs. Admins can add new rooms, specify room geolocation, and monitor attendance activities.

Priority: Medium

4.3.2 Input/Output Sequences

- **Input:** The admin adds a room by specifying the name and geolocation.
 - **Output:** The system stores the room data and confirms the addition/edit of the room.

4.3.3 Functional Requirements

- **REQ-1:** The system must allow admins to create and manage rooms with name and geolocation details.
- **REQ-2:** The system must display error messages if room creation fails due to missing information.

4.4 Geolocation Verification

4.4.1 Description and Priority

This feature ensures that users can only mark attendance when physically present in a designated room. The system uses geolocation to validate the user's presence in a specific area.

Priority: High

4.4.2 Input/Output Sequences

- **Input:** The user attempts to mark attendance with a geolocation request.
 - **Output:** The system checks if the user is within the room's defined geolocation boundaries and allows or denies attendance marking.

4.4.3 Functional Requirements

- **REQ-1:** The system must capture the user's latitude and longitude and compare them with the predefined room geolocation boundaries.
- **REQ-2:** The system must return an error message if the user is not in the correct location for marking attendance.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The website should work smoothly even when many users are online at the same time. Pages should load quickly, and actions like login and attendance marking should happen quickly.

5.2 Software Quality Attributes

- Ease of Use: The website should be easy for everyone to navigate and use.
 - Reliability: The system should be available almost all the time, with minimal downtime.
 - Maintainability: It should be easy to update the system and add new features later.
-

HOME

User LOGIN

Admin Login

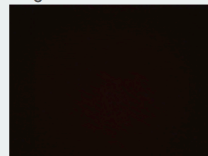
Mark Attendance

Name:

Roll Number:



Login



Capture Face

Email

Password

Login

[New User?](#)

Data

Browse the tables in this database and run SQL queries against the data.

Browse

Query

Q Choose a table

users

room

attendance

admin

session