

UML Use Case Description: Attendance System

Use Case Name	Register Face Data
Primary Actor	Student
Goal	<ul style="list-style-type: none">To capture and store the student's facial data in the system for future automatic attendance recognition.
Preconditions	<ul style="list-style-type: none">The student has a valid school ID and registered account in the system.The device (e.g., laptop, tablet, or camera) is functional and connected to the system.Internet connection is stable for uploading facial data.
Postcondition	<ul style="list-style-type: none">The student's facial data is successfully stored and encrypted in the database.A confirmation message is displayed to the student.The system is ready to detect the registered face for attendance purposes.
Trigger	The student selects the option "Register Face" in the attendance system.
Main Flow	<ol style="list-style-type: none">The system displays "Register Your Face Data."The student logs in using school credentials for identity verification.The system activates the camera and shows a live video feed.The student aligns their face within the camera frame.The system captures facial images from different angles.The captured images are processed locally to extract facial feature embeddings.The system discards the raw image after conversion.The generated embedding is encrypted and stored in the student database.The system displays "Face data registered successfully and securely."
Alternative Flows	<p>A1. Camera Error: The system notifies the user to check the camera connection and retry.</p> <p>A2. Face Not Detected: The system displays "Please adjust your position or lighting."</p> <p>A3. Duplicate Face Detected: The system alerts "Face data already exists in the database."</p> <p>A4. Low-Quality Capture: The system prompts for a clearer face capture before proceeding.</p> <p>A5. Server or Internet Issue: The system displays "Connection failed. Please try again later."</p>
Special Requirements	<ul style="list-style-type: none">The student must give explicit consent before face registration.The system must comply with the Data Privacy Act of 2012 (RA 10173).Facial data must be encrypted and stored securely.Access to biometric data is restricted to authorized administrators only.

Use Case Name	View Attendance Record
Primary Actor	Student
Goal	<ul style="list-style-type: none"> To allow the student to securely view their attendance history and verify their recorded attendance sessions.
Preconditions	<ul style="list-style-type: none"> The student has a valid registered account in the system. Attendance records for the student exist in the database. A stable internet connection is available for data retrieval.
Postcondition	<ul style="list-style-type: none"> The student successfully views their attendance history. Attendance information is displayed accurately and clearly.
Trigger	The student selects the option “ View Attendance Record ” in the system’s dashboard.
Main Flow	<ol style="list-style-type: none"> The system prompts the student to log in using valid credentials. The student logs in successfully and is authenticated. The system retrieves the student’s attendance data from the database. The system processes and displays a list or table showing: <ul style="list-style-type: none"> Date and time of attendance Attendance status (Present, Late, Absent) Subject or class details (if applicable) The student reviews the displayed attendance record. The student may choose to filter by date range or subject for easier review. The system logs that the attendance record was viewed.
Alternative Flows	<p>A1. No Records Found: The system displays “No attendance records available yet.”</p> <p>A2. Authentication Error: If login fails, the system prompts “Invalid credentials. Please try again.”</p> <p>A3. Database Error: If the system cannot retrieve data, it shows “Unable to load attendance records. Please check your connection and try again.”</p> <p>A4. Slow Connection: The system displays a loading message until the data is fully retrieved.</p>

Use Case Name	Scan Face
Primary Actor	Student
Goal	<ul style="list-style-type: none"> To automatically mark the student’s attendance by scanning and verifying their facial features using the AI-powered attendance system.
Preconditions	<ul style="list-style-type: none"> The student’s facial data has been previously registered and encrypted in the system. The student’s device or attendance terminal (e.g., tablet, laptop, or

	<p>camera) is functional and has a stable internet connection.</p> <ul style="list-style-type: none"> The system is active and ready to detect faces for attendance logging.
Postcondition	<ul style="list-style-type: none"> The student's attendance is successfully recorded in the database. The attendance status (e.g., Present, Late) is updated. A confirmation message is displayed to the student. A notification is triggered to inform the teacher and parent/guardian.
Trigger	The student's face is detected by the camera when they stand in front of the attendance system.
Main Flow	<ol style="list-style-type: none"> The system activates the camera and prepares for face detection. The student aligns their face within the camera frame. The system captures the live image and converts it into a facial embedding for comparison. The system matches the embedding with stored encrypted facial data in the database. If a match is found, the system records the attendance time and date. The system updates the student's attendance status as "Present." A confirmation message, such as "Attendance recorded successfully," is displayed. The system triggers the Send SMS Notification use case to notify the parent/guardian.
Alternative Flows	<p>A1. Face Not Detected: The system prompts, "Face not detected. Please adjust your position or lighting."</p> <p>A2. Unregistered Face: If no match is found, the system displays, "Face data not found. Please register your face first."</p> <p>A3. Low-Quality Capture: The system requests a clearer capture if lighting or camera quality is poor.</p> <p>A4. Server or Network Error: The system displays, "Connection issue. Please try again later."</p> <p>A5. Duplicate Scan: The system displays, "Attendance already recorded for today."</p>
Special Requirements	<ul style="list-style-type: none"> The system must only use previously consented and registered data. Facial recognition must not store new data without consent. Attendance records must be encrypted and timestamped.

Use Case Name	Manage Users
Primary Actor	Administrator
Goal	<ul style="list-style-type: none"> To maintain accurate and secure user records by adding, updating, or removing user accounts.
Preconditions	<ul style="list-style-type: none"> The administrator must be logged into the system with valid admin

	credentials.
Postcondition	<ul style="list-style-type: none"> The user data is successfully updated in the system database, and confirmation is displayed.
Trigger	The administrator selects the “Manage Users” option from the dashboard.
Main Flow	<ol style="list-style-type: none"> The administrator logs into the system. The system authenticates the Administrator’s credentials. The administrator selects “ Manage Users” from the dashboard. The system displays a list of registered users. The Administrator chooses to Add, Edit, Search, or Delete Users The Administrator enters or updates user details. The system validates the input and updates the database. The system confirms that changes were successfully saved.
Alternative Flow	<p>A1. Invalid Input Data. If the administrator enters incomplete or invalid details, the system prompts for correction before saving.</p> <p>A2. Database Connection Error. If the database is temporarily unavailable, the system displays an error message and logs the issues.</p>
Special Requirements	Data must comply with privacy and security policies.

Use Case Name	Manage Database
Primary Actor	Administrator
Goal	<ul style="list-style-type: none"> To maintain the integrity and performance of the system’s database through regular updates, backups, and cleanups.
Preconditions	<ul style="list-style-type: none"> The administrator has access to the database management tools.
Postcondition	<ul style="list-style-type: none"> Database updates or maintenance tasks are successfully executed.
Trigger	The administrator chooses the “Database Management” option from the admin menu.
Main Flow	<ol style="list-style-type: none"> The Administrator opens the database management module. The system displays available options (Backup, Restore, Clean Data) The Administrator selects the desired operation. The system validates permission The operation executes (e.g. backup completed, old data removed). The system displays a confirmation message.
Alternative Flow	<p>A1. Operation Failed. The backup or restore fails, the system logs the error and alerts the administrator.</p> <p>A2. Insufficient Storage. If there is not enough space for backup, the system displays “Storage Full” and suggests cleanup.</p>

Use Case Name	Train AI Model
Primary Actor	Administrator
Goal	<ul style="list-style-type: none"> To improve the system's facial recognition by retraining the AI model using updated student face data.
Preconditions	<ul style="list-style-type: none"> The system has sufficient and valid face data stored.
Postcondition	<ul style="list-style-type: none"> The AI model is successfully trained and updated in the system.
Trigger	The administrator clicks the "Train AI Model" button in the admin interface.
Main Flow	<ol style="list-style-type: none"> The Administrator accesses the "AI Model training" interface. The system displays current model accuracy and data statistics. The Administrator clicks "Train Model". The system loads existing facial data. The AI engine begins training and displays progress. After the completion, the system updates the new model and shows training results.
Alternative Flow	<p>A1. Insufficient Training Data. If the data is missing, the system alerts the administrator and cancels training.</p> <p>A2. Training Failure. If the training fails due to hardware or software errors, the system logs the issues and reverts the previous model.</p>

Use Case Name	View Attendance Records
Primary Actor	Teacher
Goal	<ul style="list-style-type: none"> To allow the teacher to view students' attendance history and monitor their class attendance status efficiently.
Preconditions	<ul style="list-style-type: none"> The teacher is logged into the system with valid credentials. Attendance data for students exist in the system database. A stable internet connection is available.
Postcondition	<ul style="list-style-type: none"> The teacher successfully views and verifies the attendance records. The system logs that the teacher accessed the attendance module.
Trigger	The teacher selects "View Attendance Records" from the Dashboard.
Main Flow	<ol style="list-style-type: none"> The teacher logs into the system. The system authenticates the teacher's credentials. The teacher navigates to the "Attendance Records" section. The system retrieves the list of students and their attendance data. The system displays records including: <ul style="list-style-type: none"> Student name and ID Date and time of attendance Attendance status (Present, Late, Absent) Subject/class details The teacher may apply filters (by student, date range, or subject).

	<ol style="list-style-type: none"> 7. The system displays the filtered results. 8. The teacher reviews the attendance records.
Alternative Flow	<p>A1. No Records Found: The system displays “No attendance records available.”</p> <p>A2. Authentication Error: If login fails, the system displays “Invalid credentials.”</p> <p>A3. Network Error: The system displays “Connection issue. Please try again later.”</p>

Use Case Name	Manage Attendance Record
Primary Actor	Teacher
Goal	<ul style="list-style-type: none"> To allow the teacher to edit, update, or correct student attendance records when necessary.
Preconditions	<ul style="list-style-type: none"> The teacher has permission to modify attendance records. Attendance data exists for the selected class or student. The system is connected to the database.
Postcondition	<ul style="list-style-type: none"> Attendance records are updated successfully in the system. The system logs all modifications made by the teacher.
Trigger	The teacher selects “Manage Attendance Records” from the dashboard.
Main Flow	<ol style="list-style-type: none"> The teacher logs into the system. The system authenticates the teacher’s credentials. The teacher opens the attendance management module. The system displays the attendance list for a specific class. The teacher selects a record to edit. The teacher updates attendance status (e.g., changes “Absent” to “Present”). The system validates and saves the modification. A confirmation message “Attendance record updated successfully” appears. The system logs the update activity for auditing purposes.
Alternative Flow	<p>A1. Invalid Input: The system displays “Invalid attendance status.”</p> <p>A2. Database Connection Error: The system displays “Unable to update records. Please try again later.”</p> <p>A3. Unauthorized Access: If the teacher lacks permission, the system displays “Access denied.”</p>

Use Case Name	Receive Notifications
Primary Actor	Parent/Guardian
Goal	<ul style="list-style-type: none"> To stay informed about their child’s daily attendance status through SMS or system notification.
Preconditions	<ul style="list-style-type: none"> The parent’s contact number must be registered and linked to the

	students profile.
Postcondition	<ul style="list-style-type: none"> The parent receives a real-time notification about the student's attendance.
Trigger	The system automatically sends a notification when the student's attendance is recorded.
Main Flow	<ol style="list-style-type: none"> The system records the student's attendance through facial recognition. The system automatically triggers the notifications event. The system retrieves the parent's registered contact details. The system sends an SMS or push notification containing the attendance status. The parent receives and reads the notification.
Alternative Flow	<p>A1. Invalid Contact Information: The system logs the error and prompts for update.</p> <p>A2. Network or Delivery Failure: Fails to send due to network issues it is retried automatically or queued.</p>