# INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN

## Department of mechanical and automation engineering

# ATTENDANCE MANAGEMENT SYSTEM USING FACIAL RECOGNITION

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# 1. INTRODUCTION

This project involves building an attendance system which utilizes facial recognition to mark the presence, time-in, and time-out of employees. It covers areas such as facial detection and recognition to cater to various use cases of the system such as registration of new employees, addition of photos to the training dataset, viewing reports, etc. This project intends to serve as an efficient substitute for traditional manual attendance systems. It can be used in corporate offices, schools and organizations where security is essential.

## 1.1 PURPOSE

The purpose of this report is to specify the software requirements of the Attendance Management System using Face Recognition. It is intended to be a complete specification of what functionality the attendance management system provides.

This project aims to automate the traditional attendance system where the attendance is marked manually. It also enables an organization to maintain its record on timely basis like time-in, time-out, and breaks taken digitally. Automation and digitalization of the system would also help in better visualization of the data using graphs to display the no. of employees present on a particular day, total working hours and breaks taken by each employee.

## 1.2 PRODUCT SCOPE

Facial recognition is becoming more prominent in society. It has made major progress in the field of security. It is a very effective tool that can help low enforces to recognize the criminals and software companies are leveraging the technology to help users access the technology. This technology can be further developed to be used in other avenues such as ATMs and sensitive

# 2. OVERALL DESCRIPTION

## 2.1 PRODUCT PERSPECTIVE

The proposed Attendance Management System will take care of the employee attendance in any organization at any point of time. The system can keep track of the employee's presence, time-in and time-out. It can automatically generate reports and graphs of their availability which can be monitored by the higher authority of the respective organization.

## 2.2 PRODUCT FUNCTIONS

- The main objective of this project is to reduce the manual work.
- The system is capable of managing employee's presence, time-in and time-out. It can generate report of their availability.

## 2.3 USER CLASSES AND CHARACTERISTICS

**We have 2 types of users of the system.**

1. Students
2. Admin

**Following functionalities can be performed by the admin**:

1. Login
2. Register new students to the system
3. Add related imagery to the training data set
4. Train the model
5. View the attendance report of all students. Attendance can be filtered by date or students

**Following functionalities can be performed by the student:**

1. Login
2. Mark his/her time-in and time-out by scanning their face.
3. View attendance report of self.

## 2.4 OPERATING ENVIRONMENT

The server-side components of the systems can have running windows or mac with necessary library supports of the system.

The client-side components of the software system must operate within common web browser environment. The minimum set of browsers must be supported is

1. Google chrome 44+
2. Mozilla Firefox
3. Apple safari

## 2.5 DESIGN AND IMPLEMENTAION CONSTRAINTS

As the system is using face recognition feature to identify each student of the organization, it must be able to identify each of them individually. According to this, system must be capable to mark their presence for the day and it should convey the same message to the student as well.

## 2.6 USER DOCUMENTATION

No specific user documentation is considered this time.

## 2.7 ASSUMPTIONS AND DEPENDENCIES

No specific assumptions or dependencies are considered at this time.

# 3. EXTERNAL INTERFACE REQUIREMENTS

The following sections will introduce the numerous requirements of the system from the point of view of different users and will introduce a number of decisions that have been made regarding implementation.

## 3.1 USER INTERFACE

The user interface for the system will be simple and clear. Most importantly, the ages must be easy to read, easy to understand ad accessible. The color scheme should be appropriate to provide familiarity with the university and there should be no contrast issues.

### 3.2 HARDWARE INTERFACE

1. I3 processor-based computer or higher
2. Memory: 3GB RAM
3. Hard drive
4. Web camera with clear image

### 3.3 SOFTWARE INTERFACE

1. Windows or mac operating system
2. Client-side browser support

### 3.4 COMMUNICATION INTERFACES

1. Communication standard: HTTPS
2. Network server: localhost
3. Chrome/Mozilla web browser

## 4. SYSTEM FEATURES

The features of the system are mainly divided into 3 modules.

1. **REGISTRATION AND LOGIN MODULE**

   This module mainly deals with the functionalities related to the registration of any new student to the university, log into the system and managing student's profile details. Using features provided by this module admin can register new student to the system and admin can log into the system using their credentials.

2. **MANAGE ATTENDANCE DETAILS**

   This module mainly deals with the features related to the student's attendance. Using this, students can mark their presence, time-in and time-out in the system. Admin can see the availability report of each student, student can see his/her attendance report along with some possible filters such as filter by student and filter by date.

3. **MANAGE STUDENT DETAILS**

   This module mainly deals with the features related to the student's profile. Using this, admin can add a photo of the newly registered student during registration. Admin can also command the system explicitly to train the model and system will make necessary calculation and will generate some data which will used internally to identify each employee uniquely.

### 4.1 MANAGE REGISTRATION AND LOGIN

#### 4.1.1 Register new employee

Description: Admin can register new

Input: employee details

Output: success message displaying to the user has been created.

#### 4.1.2 log-in to the system

Input: user credentials

Output: if the credentials are correct, user will be redirected to the dashboard of the system

Exception flow: if the entered credentials are incorrect then user will be redirected to the login page again displaying an error message.

## 4.2 MANAGE ATTENDANCE DETAILS

### 4.2.1 Mark you attendance-in

Input: user will scan his/her face using the external web camera.

Output: system will identify the user uniquely and will mark his/her in-time to the database. The same success message will be transmitted to the user.

### 4.2.2 Mark your attendance-out

Input: user will scan his/her using external web camera

Output: system will identify the user uniquely and will mark his/her in-time to the database. The same success message will be transmitted to the user.

### 4.2.3 View my attendance report

Description: Employee may often need to see his / her attendance record throughout the month or year. Using this feature one can see his / her attendance record till the date.

Input: User selection

Output: Statistical analytics of the particular employee who is currently logged into the system will be displayed.

### 4.2.4 View employee's attendance report

Description: this feature is for admin. Admin can monitor the availability of each student till the date. i.e., how many students are present today out of total students etc. can be monitored.

Input: user selection

Output: attendance record of each student including how many students are present today out of total along with availability graph.

## 4.3 MANAGE STUDENT DETAILS

### 4.3.1 Add photo of the student

Description: Admin only can access the feature. Admin can add a photo of a student during registration process.

Input: username of the student

Output: success message record has been added.

Process: system will process an image and will generate necessary system data to identify each student uniquely.

### 4.3.2 Train the system

Input: user selection

Output: system will process all the available records of the students and will generate necessary system data to identify each students uniquely.

## 5. OTHER NONFUNCTIONAL REQUIREMENTS

### 5.1 performance requirements

Some performance requirements are listed below:

- The performance of the system should be fast and accurate.
- The system should be able to handle large amount of data. Thus, it should accommodate high details without any fault.

There are no other specific performance requirements that will affect development.

### 5.1 Safety requirements

As a part of the safety requirements, we prefer to keep a backup of the system generated data in any external device.

### 5.2 Security requirements

- Utilize certain cryptographic technique
- Keep specific log or history data sets
- Assign certain functions to different modules.

### 5.3 Software quality attributes

- Portability- the system is developed for secured purpose, so it cant be portable.
- Availability- this system will be available only until the system on which it is installed, is running
- Scalability- applicable