Smart Attendance Management System

Group Members:

1. Atharva Satpute
2. Aniruddha Deshmukh
3. Pranav Deshmukh
4. Omkar Amilkanthwar

Software Requirements Specification Document

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1. Introduction

1.1. Purpose

The purpose of this document is to present a detailed description of the Smart Attendance Management System. It will explain the purpose and features of the system, the interfaces of the system, what the system will do and the constraints under which it will operate.

1.2. Scope of the Project

This software system will be an Attendance Management System for our college. This system will be designed to ease the process of marking the attendance by the lecturer. More specifically, this system will be designed to help the lecturer mark the attendance using the latest technologies like Machine Learning (ML), Computer Vision. The system also contains a database containing the data of the student.

1.3. References

Face recognition based on convolution siamese networks - IEEE Conference Publication

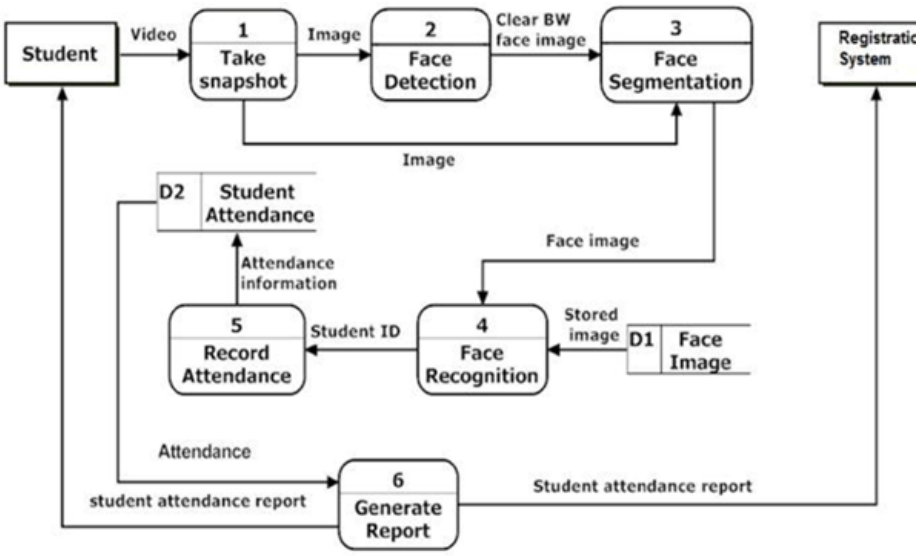
One-Shot Learning for Image Recognition

1.4. Overview of the Document

The next chapter, the Overall Description section, of this document gives an overview of the functionality of the product. It describes the informal requirements and is used to establish a context for the technical requirements specification in the next chapter. The third chapter, Requirements Specification section, of this document is written primarily for the developers and describes in technical terms the details of the functionality of the product.

2. Overall Description

2.1. System Environment



The Smart Attendance Management System has four active actors and one cooperating system. The Student, whose attendance is to be taken, the Lecturer, who will take attendance. The Admin will have access to the whole system directly.

The Smart Attendance Management System first scans image of student through camera. This image is processed, and it is checked whether the student has already registered or not, if not then information like mobile number, address, roll number, PRN number is asked. This information gets stored in the MYSQL database and retrieved when required. Hence analyzing images with the help of machine learning recognizes the person accurately.

The key point of The Smart Attendance Management System is it recognizes student faces very efficiently and student information is stored in well organized manner.

Whenever we want we can get the attendance of each student and display it in tabular form.

2.2. Constraints

1. **Memory Constraints –**

   Memory will be used to store image encodings of particular students, attendance, etc.

2. **Hardware Limitations –**

   A High Resolution Camera is required to capture the image for processing it to get the output.

3. **Libraries Used –**

   Tensorflow, Keras, MTCNN, OpenCV, Flask, Android

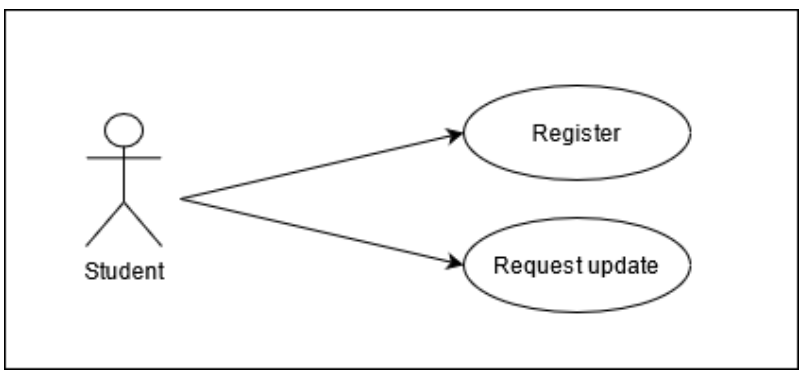
2.3 Functional Requirements:

This section outlines the use cases for each of the active actors separately.

2.3.1 Student Use case

Use Case: Register and Update

Diagram:



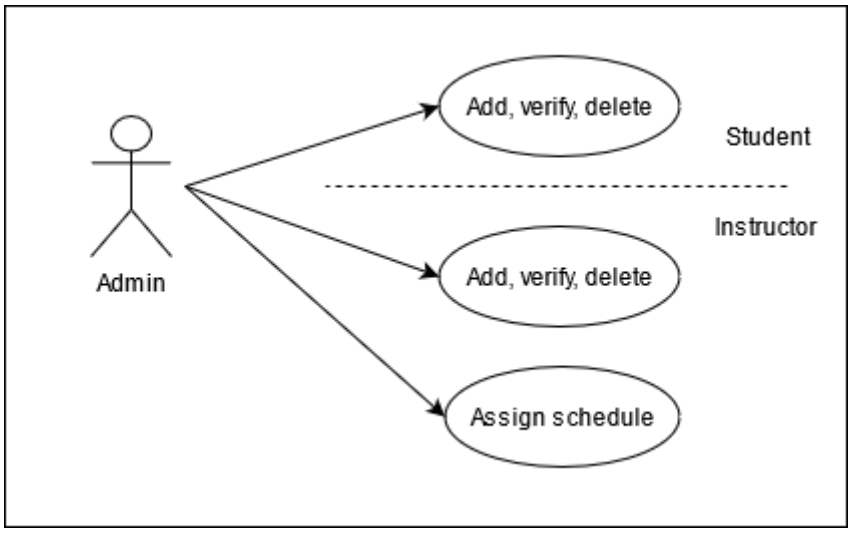
Brief Description:

The student will be able to register into the system and will be able to check this attendance as well.

2.3.2 Admin Use Case

Use Case: Add, Verify & Delete

Diagram:



Brief Description:

Admin will be able to add,delete and verify the new entries in the system.He/She will also be able to assign new schedules to respective teachers.

2.4 Non Functional Requirements

This system will be on a server with high internet capability. The software developed here assumes the use of a tool called Flask for connection between the software and the MYSQL server.

3. Specific Requirements

3.1 Functions

1. Register student to the database
2. Capture the image of students in a class.
3. Process the image to obtain attendance of the class
4. Update the attendance in a database.
5. Show the attendance on the interface used by students

   e.g. Mobile App