Software Engineering CS - 303

Software Requirements Specification

for

FACIAL ATTENDEE

Group Members

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Contents

1 Introduction

1.1 Purpose

The purpose of this document is to outline and describe the functional and performance related requirements relating to a Facial Recognition Attendance System named as 'Facial Attendee'. The rest of this document will describe some of the main requirements that will go into making this application functional. Specifically, it will outline the type of database used, programming languages, technologies used and user interfaces. This Software Requirements Specification document describes the whole ecosystem including software and hardware used in product development and maintenance.

1.2 Document Conventions

Document convention which is to be followed in this document is: Priorities for

Arial	20 size	Bold	Headings
Arial	16 size	Bold	Subheadings
Arial	12 size	Normal	Text

higher-level requirements are inherited by detailed requirements

1.3 Intended Audience and Reading Suggestions

Main Target Audience of this document is IT department heads of various school universities and offices who will evaluate the feasibility and quality of our product to make an efficient decision regarding our product. Also, this document will be provided to our software testers. Furthermore, we are going to present this to our project evaluators also.

1.4 Product Scope

The software system being produced is called 'Facial Attendee'. It is being produced for a customer interested in automating their attendance system. This system is designed to "provide Facial recognition system" for the Attendance process. This system is largely cross-platform and is available to anyone using the department's provided computer resources in their organization. The system will be run on a central server with each user having a remote user interface through a web browser to interact with it.
The software first captures a collection of images of all the students/workers in an organization and stores the information into the database. Next time whenever the registered person enters the premises the system recognizes the person and marks his attendance along with the time. This not only saves the time of the administration but also decreases the proxy rate. Hence the overall objective is to make attendance procedure more quick and reliable.

1.5 References

Purpose	Link	Date
Reference Document of existing Competitor	https://github.com/iitmcvg/attendance-system	3.12.2018
Project Proposal sent by the customer	https://github.com/Rajani1998/Facail-Attendee/blob/master/ProjectProposal.pdf	3.3.2019
Privacy Policy for End Users	https://github.com/Rajani1998/Facail-Attendee/blob/master/ProjectProposal.pdf	3.3.2019

2 Overall Description

2.1 Product Perspective

Facial Attendee is a replacement for the manual attendance system that is used in major educational institutes. The system manages the attendance by detecting the human face when he enters the premises.

2.2 Product Functions

Initially, the students or workers will be added to the system with their information and data. Then the teacher or admin will add the attendance sheet and students and workers present will be marked by detecting their faces at the entrance. Teachers have an option to verify the present student's list before finalizing that attendance sheet. A user will be notified for the commencement of class and if he/she missed the class. Teacher and user can track the attendance record. The user can also report if he/she was incorrectly marked absent.

2.3 User Classes and Characteristics

- A Attendee which can be a Student/Office person,usually their attendance will be maintained by system.
- A Attendance Manager, who will be usually a teacher or office managers.
- IT department - need full access to database and access to the admin menus.

2.4 Operating Environment

The system will require a camera that will detect the user. Admin web portal will require a Personal Computer with Internet Service. User mobile application will be installed on an Android device that will also require Internet Service.

2.5 Design and Implementation Constraints

Following are the assumptions which are taken while developing the software;

1. The user will face the camera for a minimum of 1 second.
2. No two students or workers will be enrolled in the same group whose facial appearance is almost identical.
3. The user will upload his/her new image set after a prominent change in facial appearance. For example: after getting bald or shaved, wearing glasses, wearing a Scarf (for ladies).

2.6 User Documentation

The working model video guide with user manual will also be designed for each user (admin and regular user) that will guarantee the understanding of the working methodology of the system.

2.7 Assumptions and Dependencies

We our assuming that every student owns a android smartphone with a working internet connection (which is common assumption).Project is mainly dependent on our 3rd party software library Tensorflow v1.11. This is a rapidly changing is library is backed by Google hence it is a dependable source.

3 External Interface Requirements

3.1 User Interfaces

3.1.1 Web Application Interfaces

1. Log in Page - This interface will provide the instructor to log on to the website.
2. Sign up Page - This interface will allow instructor / institute to get registered.
3. Dashboard - After getting registered instructor will land to Dashboard which will have Summary of all of his / her courses.
4. Take Attendance Page
5. View All Attendance
6. Pending Sheet - If instructor selects 'Take Confirmation before Submitting Attendance' then this page will show all pending sheets.
7. Notifications Page - If a students reports an attendance then reported attendance will be shown here.

3.1.2 Mobile Application Interfaces

1. Log in Page - This interface will provide the student to log on to the application.
2. Change Password - For the first time user will asked to set the permanent password. Also this screen will be used to change password screen when required by user.
3. Home - Shows the attendance record of all the courses enrolled of that day particular. User can change date and see month view too.
4. View Profile
5. Edit Profile
6. Add Images - After a period user will be asked to add 3 to 4 current images or after any major physical change.
7. About Developers - Short Description regarding developers
8. Settings - where a user can change notifications and times settings.

Note: All the User Interface Screen designs are attached in the given folder.
https://github.com/Rajani1998/Facail-Attendee

3.2 Hardware Interfaces

3.2.1 Web Application

- Device with a Web browser
- Internet connection
- Normal Personal Computer Specifications minimum

3.3 Mobile Application

- Device with Android OS installed
- Camera with 2mp resolution or greater
- Internet Connection
- Minimum Free 15MB space on device

3.4 Software Interfaces

Mobile Application	Andriod JAVA
Web Application	HTML CSS and Bootstrap
Server	Python Django
Database	MySQL
Image Processing	Python, OpenCV, Tensorflow

Hence the server must have an MYSQL database system. Whereas on the client side the student must have Android SDK 20+ and the instructor must have a browser that supports javascript and HTML5.

3.5 Communications Interfaces

The system shall use the HTTP protocol for communication over the internet.

4 System Features

This section is shows core features of the system:

4.1 Manage Regular User Records

4.1.1 Description and Priority

This feature will manage the records of regular users which includes their information i.e names, roll no, courses in which he is enrolled.

Benefit	6
Cost	4
Risk	1

4.1.2 Stimulus/Response Sequences

Admin has an option in application to check the record of any student with respect to name, roll no, a course in which he is enrolled.

4.1.3 Functional Requirements

1. Using App Based format
2. Select the "User Information" option on the main page, It will give all the information for all the users
3. You can select some of the users by name, roll no or enrolled course by entering these things in search bar option which will present at the top of the screen

4.2 View Regular User Attendance

4.2.1 Description and Priority

This feature will also use for admin to view regular attendance of any student who enrols in a particular course.

Benefit	9
Cost	4
Risk	1

4.2.2 Stimulus/Response Sequences

This will work the same as a first use case that admin has the option to see the of a particular student with respect to name, roll no and course in which he enrolled.

4.2.3 Functional Requirements

1. Using App Based format
2. Select the "User Information" option on the main page, It will give all the information for all the users
3. Then Click to option "Attendance", Which gives attendance information of all the users
4. You can select attendance of specific users by name, roll no or enrolled course by entering these things in search bar option which will present at the top of the screen

4.3 Take Attendance

4.3.1 Description and Priority

This feature is also related to the admin in which admin will take attendance with the help of video/picture from the camera.

Benefit	9
Cost	6
Risk	5

4.3.2 Stimulus/Response Sequences

Admin responsibility is to take attendance by choosing the option of taking attendance in the application, after selecting this option camera will automatically power on and class attendees can be captured by picture/video and after capturing all the students, the attendance will be done.

4.3.3 Functional Requirements

1. App Based System will use by admin to catered this option
2. Select "Take Attendance" option from the home page
3. Select a particular course from courses options
4. After selecting the course camera will open automatically then captured by video/picture
5. After capturing all the students the attendance will complete

4.4 Validate Attendance

4.4.1 Description and Priority

This feature is also for admin to check or validate attendance on User dissatisfaction about attendance.

Benefit	8
Cost	2
Risk	1

4.4.2 Stimulus/Response Sequences

Validate attendance is the most important functionality of the application for admin to validate someone's attendance on his concerns and show their attendance with evidence or in case of wrongly marked attendance change it attendance correct accordingly.

4.4.3 Functional Requirements

1. The concern will notify from the user
2. Select the "User Information" option on the main page, It will give all the information for all the users
3. Then Click to option "Attendance", Which gives attendance information of all the users
4. Search for particular student according to the information given by the that student
5. Verify his issue with evidence/proof

4.5 View Regular User Attendance Record

4.5.1 Description and Priority

This feature is related to the student to check his regular attendance for validation.

Benefit	9
Cost	1
Risk	1

4.5.2 Stimulus/Response Sequences

This feature is very important for Users/Students to check their daily attendance through web based system in order to inform admin in case of wrongly marked attendance.

4.5.3 Functional Requirements

1. Using Web based format
2. Select "View Attendance" Option from the menu on the home page
3. Select the particular course for which he wants to check attendance
4. This will show the attendance record

4.6 Report Incorrect Attendance Record

4.6.1 Description and Priority

This feature will use for the student to inform admin about their attendance validation in case of the wrong attendance.

Benefit	9
Cost	2
Risk	1

4.6.2 Stimulus/Response Sequences

In case of wrongly marked attendance notify your concern to admin by selecting concerns option in the web-based system and fill the mandatory fields to forward his concern to admin panel then admin panel will check it accordingly

4.6.3 Functional Requirements

1. Using Web-based format
2. Select "View Attendance" Option from the menu on the home page
3. Select the particular course for which he wants to check attendance
4. This will show the attendance record
5. Verify your attendance, In case of any ambiguity, Go to options 'Concerns' from home page and fill the mandatory field

Note: In case of not fill all the mandatory fields and trying to submit your concern it will give the error to fill all the mandatory fields

5 Other Nonfunctional Requirements

5.1 Performance Requirements

Our system has the great role of its quick and fast performance behaviour. Since if it takes more time to recognise a person it will result in a long queue of students outside class which will eventually result in a delay in class. So our image recognition process needs to be fast enough in order to bring overall overhead down.

5.2 Safety Requirements

In order to make use of app more secure will try to stop in false use of our application. Also to secure the Application will recover after a system crash in no longer than 5 minutes. The Application will always be available to be used by the user.

5.3 Security Requirements

All user's personal pictures will be encrypted and saved so that it will be safe from online hackers. Firebase auth is used in order to save any unauthorized access to the application. Also, each id generated unique 21 character string so no chance of brute force attack on the system. The system will not disclose personal information or pictures of the end users. The Application will not communicate with any other devices or servers.

5.4 Accuracy

Accuracy is the most important concern in our system. If our system is not accurate enough to detect each individual. If our system is not detecting even 10 percent of attendees then it will lead to overall failure of the project because it is a replacement of a manual system which is 100 percent accurate. The system also provides an option to teacher or admin to verify the students or workers and then finalize their attendance.

5.5 User Guide

The working model video guide with user manual will also be designed for each user that will guarantee the understanding of the working methodology of the system.

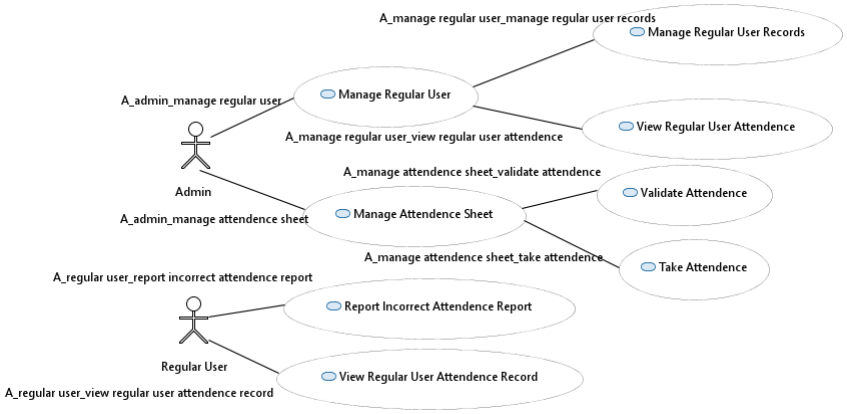
Appendix A

Glossary

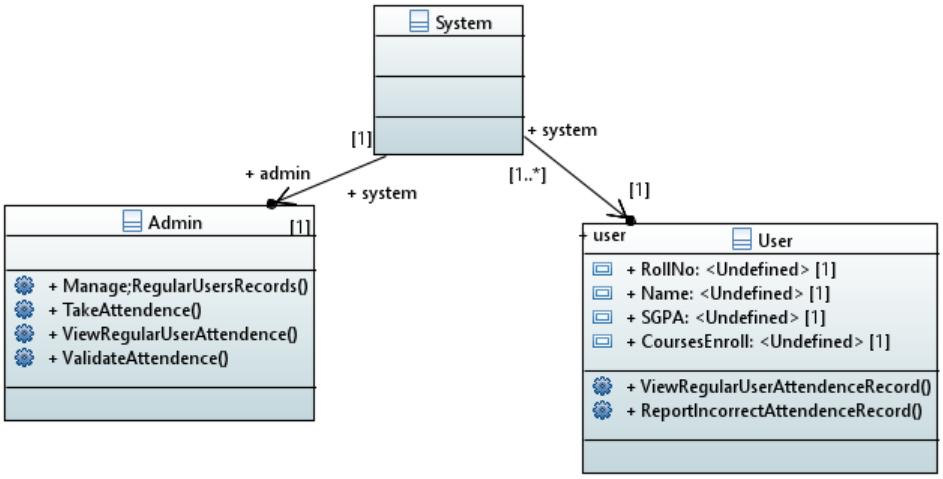
Terms	Definition
Attendance	The marking of number of students/workers for every class
Attendee	The student/worker enrolled/working in a course/organisation whose attendance is to be taken
Admin	The user of the web application; a person who is to take and maintain attendance
Brute Force Attack	Attacker submitting many passwords or pass-phrases with the hope of eventually guessing correctly
Encrypted	Data converted into the code to avoid unauthorized access
Enrols	To be officially registered in class (for attendance purpose)
MP	Mega Pixels
OpenCV	A library of programming functions mainly aimed at real-time computer vision
Overhead	Combination of excess or indirect computation time, memory, or any other resources
Recognize	To be able to identify or match the face from the database
SDK	Software Development Kit
SDK 20+	Oldest android version android app can efficiently work on
Stakeholders	Any person who has interaction with the system who is not a developer
Tensorflow	A free and open-source software library for dataflow and differentiable programming
Video Guide	A video tutorial with step by step instructions on how to use the system
Web Portal	Web application for the teacher/manager of attendance

Appendix B

Use Case Diagram



Class Diagram



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