

Software Requirement Specification

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1. Introduction

The following document encompasses the software requirement specification for our Facial Recognition Attendance Monitoring Engine. This will discuss the purpose of the system, the scope, what our objectives are as well as functional and non-functional requirements. The document will also contain system models that we will use to develop and implement the system requirements discussed.

1.1 Purpose of the system

The purpose of F.R.A.M.E is to analyse User's faces using facial recognition and correlate this with their existing information in a database to mark them as attended in their lecture or class. F.R.A.M.E will be a portable system that can be placed at the entrance of lecture theatres or classrooms, allowing quick and easy attendance gathering. The system can also analyse the information to provide analytics and important information on sessions, such as plot graphs. This can be used by faculty to gain valuable insight into why User's may or may not be attending required classes.

Currently, many educational institutes use outdated attendance gathering methods. These include paper registers and card scanners. F.R.A.M.E's purpose is to give students an interactive and seamless method of attending. Many educational institutes do not have a school policy with gathering attendance, as individual lecturers may take attendance differently. Having a system that can aggregate all of this information into a single database, where information can be pulled from, gives the faculty a system that is easily scalable and universal.

1.2 Scope of the system

Our project scope focuses on several core elements that allow us to have a functioning lightweight system, whilst still having future development option available to us. This is broken down into three sections; prototype scope, core scope, and future scope.

Prototype Scope:

Implementation of the prototype requires a much more limited list of functionalities. This includes; storing images of person(s) who are supposed to be in attendance of events, perform image analysis of the camera feed against this image store to recognise an individual, notify the user that they've been recognised and marked in, and implement a basic General User Interface for clarity of use.

Core Scope:

The core scope is meant to represent the project as we would like to see it finished on schedule. It encapsulates all of the functionality shown in the prototype scope, some parts modified, and adds more features as well as some non-functional requirements. The core scope includes:

- Retrieval of a selection of student profiles from a back-end database for each event
- Analysis of live camera feed in comparison with the retrieved student images
- Capturing image of students recognised and timestamping them
- Sending data to back-end database including the previously mentioned information as well as an attendance mark

- Clearly display on GUI whether the user is recognised or not
- Providing clear instructions to those not recognised
- Ensure fast run-time of the process from the recognition to attendance mark segment

Future Scope (Out of scope):

The future scope includes potential additional features that project F.R.A.M.E could be expanded to do. Functionalities and features mentioned here are not guaranteed to appear in the final product and are sensitive to time-constraints and decisions made during the development process. The list serves as an idea bank for how we could extend project F.R.A.M.E.

- Lateness marking function
- Asking user(s) to remove obstructions that impair the camera's ability to give clear imagery to be analysed
- Updating individual student's profiles with recent images so that changes in appearance over time become less of a problem

1.3 Objectives

A successful development of project F.R.A.M.E would be a lightweight, easy to use, fast and adaptable software that helps to streamline the attendance monitoring process. Our key goals are to ensure that at no point is accuracy and reliability compromised, whilst still achieving a high standard in speed of use and ease of use.

2. Proposed System

Our proposed system will be interfacing between Python facial recognition libraries, a python GUI and back-end developments using MySQL and AWS as a host platform.

3. Functional Requirements

The functional requirements of project F.R.A.M.E are to capture images of users who try to use it, check that image against a store of images in a pre-determined class (according to a schedule) and see if the person in front of the camera is part of that class. If so, they are marked as in attendance and at the end of each session the relevant lecturer is emailed a copy of this list of those in attendance.

4. Summary

Project F.R.A.M.E is being developed with the expressed goals of taking work out of the hands of lecturers; creating a better environment for lecturing by removing unnecessary distractions and improving the accuracy of data captured regarding attendance. These goals and clarifications of goals should allow us to deliver just this.