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| TBX-ECA Order Integration Phase 1  Title: System Delivery Specification |
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# Introduction and Overview

As the need for automation increases to minimize human effort and to overcome difficulties faced in keeping track of authorization along with regulation of personnel entering in the company there is a need for creating a system that assists in implementing the same.

The goal is to design a system that identifies an employee who is entering the company’s premises and to retrieve his/her credentials along with noting the date and time at which the entry has been made.

## In-scope: overall project

Once an employee enters the building he/she is asked to stand in front of a webcam placed at the reception desk. The screen on the reception desk displays the name and credentials such as corporate ID and Track (for the new LEAP trainees) for the particular person. Once the person standing is verified as the person whose name is displayed the date of joining and the time of entry is recorded and stored on the database.

The project also offers functionalities such as uploading data for specific purposes i.e. uploading photos for recognizing new set of people and uploading excel sheets for storing credentials of a large number of people on the database. The project has its primary focus on the newly hired employees undergoing LEAP training.

## Out-of-scope

The project can be further extended into designing a tracking and attendance management system that records the entries of the employees that have entered the building and store their attendance on the database. The date, time and duration of each employee belonging to the target audience is recorded on a daily basis.

The enhancement of this project is focused toward attendees of talent and development classes and also toward the contract employees and house-keeping staff whose duration needs to be recorded.

## Assumptions

* The functionality will work as close as it did now
* The accuracy of match will be greater than 90% as long as the necessary conditions (described later) are sufficed
* The entries provided to the database through the excel sheet are valid and follow the same format as to which it is required
* The photos provided follow specific naming conventions and belong to the corresponding person

## Technology used

1. Python version 2.7.13 for back end development
2. Pycharm community edition and Atom text editor development environment
3. OpenCV 2.4.13 image processing library
4. Sqlite3 database
5. Flask web development kit
6. PyQt4 GUI maker for python
7. HTML5, CSS and bootstrap for front end development

# Summary of solution approach

Using openCV’s model in python to create a face recognizer that recognizes employees who submit their photos for recognition.

## Solution constraints

1. Poor quality of photos provided
2. Very few samples per person for robust authentication
3. Recognition is light sensitive and error prone.
4. Detection difficult if face is oriented towards left/right.

## Solution alternatives

1. Other face recognition libraries such as dlib(for face detection) and open face (for recognition) can be used.
2. Using various other biometrics for authentication such as fingerprint scanner or retina scanner.