CUSTOMER REQUIREMENT SPECIFICATION

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Automated Intruder Detection for Corporate World

Automated Intruder Detection using facial recognition for office premises where Intruder can make use of tailgating to get entry and have access to confidential data

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Definitions, Acronyms and Abbreviations

CapsNet = Capsule Networks

SCC = Security Command Centre

References

We looked at CRS example document by Chanakya University.

https://github.com/CankayaUniversity/ceng-407-408-2017-2018-project-face-and-iris-recognition/
wiki/Software-Requirements-Specification

Change History

This section describes the details of changes that have resulted in the current CRS document.

#	Date	Document Version No.	Change Description	Reason For change
1.	16-02-19	1.0	Rough Data	
2.	17-02-19	1.1	Document Update	Few adjustments
3.	17-02-19	1.2	Document Review	

1.0   Introduction

This documentation stands as a reference guide for the idea, design and implementation details of the automated Intruder Detection application that is being developed as a part of the Minor project. The main purpose of the application is to make Intruder Detection hazle free task with utmost accuracy without intervention of manual methods.

1.1   Scope

Every Company want to save its confidential data from outside world. This data can be obtained from hacking organisation's computer system or gaining access into the company. Intruder can make use of tailgating to get into office premises. As current methods are not efficient for security and hence, there is a need to devise new and efficient method. We offer a high-level security system to detect intruder using face recognition and we will also send that report to the Security Command Centre so that they can can take care of Intruder.

2.0   Product Perspective

This product can be made and run independently without any dependency. The hardware requirements for development would be an interface with a application gui running. The Intruder Detection stats from the captured image would be sent to the main server..

2.1   User Characteristics

The main end-user of this application would be SCC Personnel.

● end-user may not have the technological expertise that would enable him/her to use

the application

● end-user need not know the entire algorithm to use the application.

● SCC Personnel interact with application through simple user interface that is provided
     tohim/her.

● SCC personnel might find this method more convenient and easier than traditional method.

2.2   General Constraints, Assumptions and Dependencies

- Zero power shutdown tolerance
- System capable of handling 5 requests
- Preferable to Linux os
- Clean visuals for the Camera
- Operations and updations should be atomic
- User access only after credential check
- Privileged access to lecturers to schedule special class/cancel class
- Student restricted only to view and submit request upon wrong marking

2.3   Risks

The major risk is to maintain high true-positive even a single false-positive could lead to improper attendance , hence should majorly focus on the accuracy rate of our project. Resource
DB should be given utmost security as it contains details of each and every students with
their related data .The access for the attendance portal should be secured with userid and
pass-key to restrict anonymous user access.
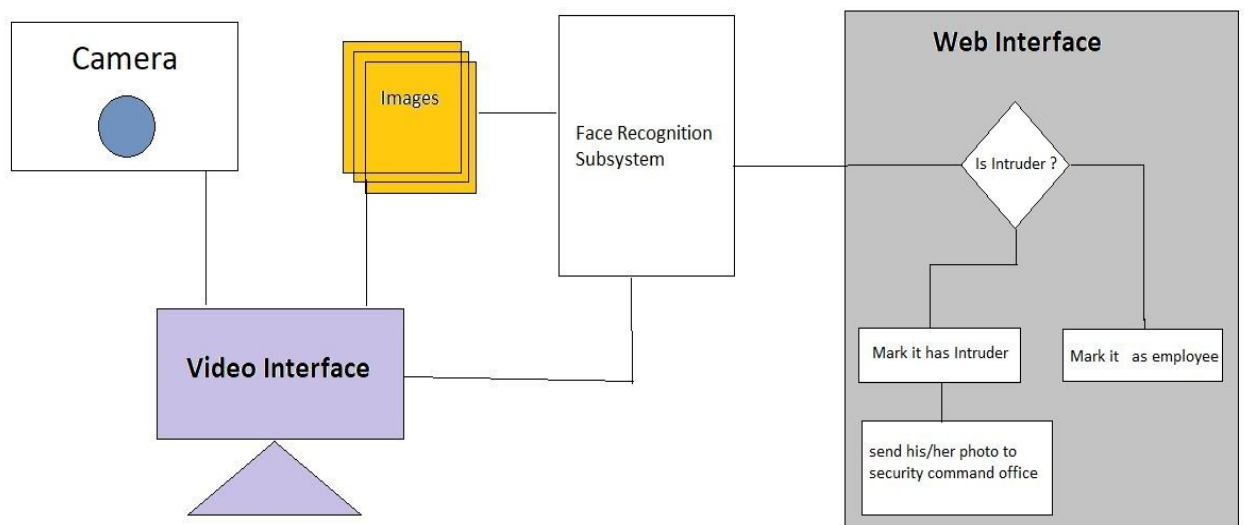
3.0   System Architecture

Fig: Automated intruder Detection system

Our prime sensor for building the product will be camera , preferable which is capable of taking high resolution videos. We extract the images from videos which frame have faces. Once the extracted images is sent to face recognition subsystem where the algorithm for the face detection and recognition runs and follows the output to the main server , where it updates the intruder in the registry of the database.

4.0   Requirements List

4.1   Module / Scenario 1

Reqmt #	Requirement
CRS – 1	Proper Light illumination No obstacles to visuals

4.2   *Module / Scenario 2*

Reqmt #	Requirement
CRS – 1	Multiple Servers to handle server break-down and ensure fault-tolerance

5.0   External Interface Requirements

5.1   *Hardware Requirements*

Automated Intruder Detection system requires
- Camera enabled Laptop or Desktop
- 8 GB RAM
- Intel i3 and above Processor
- GPU

5.2   *Software Requirements*

Automated Intruder Detection system requires
- Windows 7 or above operating system
- Python 3.6
- Keras and Tensorflow (modeling)
- Open Cv2 and DLib (Image Processing)
- Python Flask (Web interface)

6.0   User Interfaces

Web based user interface is provided where SCC personnel can check entry of Intruder. With time each intruder face image is updated in webpage. Log in functionality will be provided so that only authorized can view the site and access the data to further requirements The design is meant to be very user friendly and intuitive. Minimal button clicks and maximum information display are the current goals of the design. A simple yet immersive user experience is kept in mind while designing the application.

We also provide video interface which will show live video captured in camera and mark the intruder face with rectangle box. This interface can be helpful to see what exactly the intruder is doing until further steps are taken.

7.0   Performance Requirements

- Storage to store the dataset.
- Recognition of multiple faces in captured images.
- Recognition of face from different angel.
- Storing the features of the datasets.
- Database or file to store employee details.
- Mapping employee name with feature captured.
- Should be compatible across all heterogeneous systems
- Devices MUST be connected to the internet at all times for any tasks to be performed.

8.0   Special Characteristics

- Doesn't require human intervention.
- Less infrastructure.
- It doesn't require high speed internet.
- It doesn't have high maintenance issues
- Working module is isolated from actual front-end
- User specific login.
- Certain quantities are re-evaluated for correctness
- It saves time.

9.0   Help

The application will be intuitive by itself but a user guide will be published to aid users nevertheless

10.0 Other Requirements

We may require camera with specific resolution capacity to capture the image and process it.

10.1 Site Adaptation Requirements

- Device should be capable of running machine learning algorithm to work with facial recognition algorithm
- The web browser used to access the application should be able to run html, php and Java script either natively or by support of an external module
- Necessary storage, internet, location and network permissions must be granted on all systems that the application is running on, failing which the application might run incorrectly or fail to run.

10.2 Safety Requirements

One should run the algorithm only after making sure of hardware requirements.

The login credentials to the application must be private at all costs.

The user using the app must be SCC personnel or recognized member of the organization.

Any defect or loopholes must be taken care of.

11.0 Packaging

Packing will be in terms of series of webpages which can be hosted with the help of servers. Only required pages will be available for the users without revealing the source code of the project and algorithm that builds up the project with the help of this web interface user should be able to perform basic operations that are necessary.

12.0 Traceability Matrix

URS Reference Section No. and Name	CRS Reference Section No. and Name

- The CRS is the basis for changes in specifications or requirements of the design in the project. It should be reflected in the Change History section.
- The CRS should state requirements and constraints clearly and concisely. Design details should not be included in the CRS.