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3. Project Title: Face Recognition
4. Company Name: MSBC Solutions (India) Pvt. Ltd.
5. Tools/Technologies: Python , Flat Database
6. Work Done: 1. SRS(Software Requirement Specification)
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1. Remarks (External Guide), if any
2. Remarks (Internal Guide), if any

**Internal Guide: External Guide:**

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Head of Department Team Manager

**Software Requirement Specification:**

**Project Title: Face Recognition**

**INTRODUCTION:**

**Purpose:**

Purpose of Building Face Recognition System is for the identifying the faces from image capturing devices or from the images and videos.

**Scope:**

There are some scope for the current system to which solutions can be provided as a future

Development:

1. Image quality affects how well facial-recognition algorithms work. The image quality of scanning video is quite low compared with that of a digital camera.

2. When a face-detection algorithm finds a face in an image or in a still from a video capture, the relative size of that face compared with the enrolled image size affects how well the face will be recognized. An already small image size, coupled with a target distant from the camera, means that the detected face is only 100 to 200 pixels on a side. Further, having to scan an image for varying face sizes is a processor-intensive activity

3. The relative angle of the target’s face influences the recognition score profoundly. When a face is enrolled in the recognition software, usually multiple angles are used (profile, frontal and 45-degree are common). Anything less than a frontal view affects the algorithm’s capability to generate a template for the face. The more direct the image and the higher its resolution, the higher the score of any resulting matches.

4. Ironically, humans are vastly superior to technology when it comes to facial recognition. But humans can only look for a few individuals at a time when watching a source video. A computer can compare many individuals against a database of thousands.

5. As technology improves, higher-definition cameras will become available. Computer networks will be able to move more data, and processors will work faster. Facial-recognition algorithms will be better able to pick out faces from an image and recognize them in a database of enrolled individuals. The simple mechanisms that defeat today’s algorithms

6. An immediate way to overcome many of these limitations is to change how images are captured. Using checkpoints, for example, requires subjects to line up and funnel through a single point. Cameras can then focus on each person closely, yielding far more useful frontal, higher-resolution probe images. However, wide-scale implementation increases the number of cameras required

**Objectives of the System Development**

The basic aim of this research study is to design an effective and secure technique for personal authentication using iris recognition and also evaluate the performance of the designed framework by comparing the performance of existing iris recognition system. The study also provides the iris template security mechanism to secure iris recognition system.

Design of a Security Template to secure Iris recognition system.

The reason behind on this demand for the replacement of old-fashioned automatic personal identification tools by new one. The old-fashioned automatic personal identification tools uses traditional approaches such as Personal Identification Number (PIN), Login Id, ID card, password etc. to verify the cognizance of a person, are no longer considered as credible adequate to gratify the security concern for person identification system.

**Goals of implementation:**

The goal of this system is to tackle these problems in an effective and optimal manner by:

* Make the system user-friendly by providing an intensive user interface.
* Easy access through queries and reports for the administration department.
* Restricted data access to user thus providing additional security to data.
* Provide the security implementation system to the user.

**Intended Audience and Users:**

* The user of the System are:
  + Admin
  + User

**Overview:**

**Environmental Characteristics:**

* **Hardware :**
  + Processor: Pentium processor of 400MHz or Higher
  + RAM : Minimum 64GB primary memory
  + Hard disk: Minimum 1GB Hard Disk
  + Monitor : Preferably Color Monitor
  + Web Camera
  + Compact Disk Drive
  + A keyboard and mouse
* **Software:**

Text editor: Sublime, CMD

Database: Flat Files or Training Datasets

OS: Any

**Feasibility Study:**

Feasibility Study is the measure of how beneficial the development of information system will be to an organization. The feasibility analysis is categorized under four different types.

* Operational Feasibility
* Technical Feasibility
* Schedule Feasibility
* Economic Feasibility

**Operational Feasibility:**

The system will provide advantageous and reliable services to user. The system can be run within suitable environment, system will do operation under environment of limited resources.

**Technical Feasibility:**

It is planned to implement the system using Jupyter, Window 10 Operating system, Flat Files or Trained Datasets.

Definitely these tools and technology has fully development and maintenance for this project in today and future in development and modifying. All tool done different work like jupyter used for built a basic structure of this system, python used for different alert and development, flat files or some trained data are used as a datasets for the face recognition system.

**Schedule Feasibility:**

We give time round about 4 month for the development of this project. How much time on every task is spent shows on this Gantt chart.

**Economic Feasibility**: Economic feasibility have more two type.

Cost Estimation, further two types in which 1. One time cost 2. Recurring Cost.

1. One time cost: Before the development of project in which we used Laptop, OS,

Application: Sublime, Google Chrome.

Total cost before development is round about 50000.

2. Recurring Cost: There are two type ongoing estimation

1. Operational Cost

2. Maintenance Cost.

We have our own website and we also have extra tools and technology. If there occur

Any fault in these components then its cost round about 10000.

**Functional Requirements:**

**1. Admin:**

* Login:

Description: Admin can login into system by entering username and password.

I/p: Admin Username & Password

O/p: Successful or unsuccessful message

* Manage Users:

Description: Admin can manage user.

I/p: Add user, Remove user.

O/p: User details

**2. User:**

* Registration:

Description: User can register into system.

I/p: user register

O/p: registration successful.

* Login:

Description: user can login into System by entering username and password.

I/P: User Username & Password

O/p: Successful or unsuccessful message

**Non Functional Requirements:**

**Performance:**

The system must be interactive and the delays involved must be less .So in every action- response of the system, there are no immediate delays. In case of opening windows forms, of popping error messages and saving the settings or sessions there is delay much below 2 seconds, In case of opening databases, sorting questions and evaluation there are no delays and the operation is performed in less than 2 seconds for opening ,sorting, computing, posting> 95% of the files. Also when connecting to the server the delay is based editing on the distance of the 2 systems and the configuration between them so there is high probability that there will be or not a successful connection in less than 20 seconds for sake of good communication.

**Reliability:**

As the system provide the right tools for discussion, problem solving it must be made sure that the system is reliable in its operations and for securing the sensitive details.

**Availability:**

If the internet service gets disrupted while sending information to the server, the information can be send again for verification.

**Usability:**

As the system is easy to handle and navigates in the most expected way with no delays. In that case the system program reacts accordingly and transverses quickly between its states.

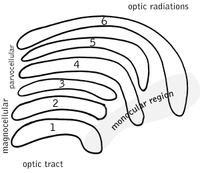
**Difference among image, photo and images**

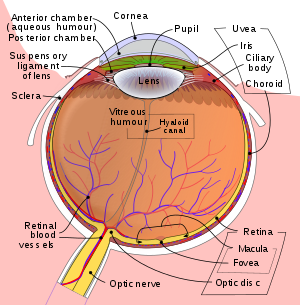
**Image:**   
Image is the picture which are saved in electronic form e.g. in our phone's gallery.

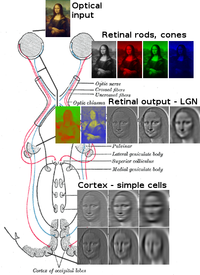
2-Dimesional Representation of visible light spectrum.  
  
**Photo:**   
Photo is a short form of photography. Basically photos are those pictures which are captured via camera.  
  
**Pictures:**   
Pictures are the paintings or drawings of anything created by humans.

How Human See Image.

Six Layers of visual processing of Human Visualization. Human can do more better image processing than current image processing system that are available.







Above image shows that processing of the getting optical output from the simple cells.

How Computer Store Images?

OpenCV uses RBG color space by default.

Each Pixel coordinate (x, y) contains 3 values ranging for intensities 0 to 255(8-bit).

* Red
* Green
* Blue

Mixing different intensities of each color gives us the full color spectrum.

* **Example** :- Yellow
  + **Red** – 255
  + **Green** – 255
  + **Blue** – 0

Images Are Stored In multi-dimensional arrays.

Black and White images are stored in 2-Dimensional arrays.

There are two types of B&W images.

* **Greyscale:** ranges of shades of grey
* **Binary:** pixels are either black or white

Image Processing Can done by many techniques and methods.