

A project report on

**Time Tracker System using Face Detection**

Submitted in partial fulfilment of the requirement

For the award of the degree

**MASTER OF COMPUTER APPLICATIONS**

of



Visvesvaraya Technological University

Belgaum, Karnataka

By

**BHARGAVI S**

**1CR18MCA57**



**CMR INSTITUTE OF TECHNOLOGY**

**132, IT Park Road, Kundalahalli, Bangalore-560037**

**2019-2020**

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under the guidance of

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**Department of Master of Computer Applications**

**Bangalore-560037**



***CERTIFICATE***

*This is to certify that the project work entitled*

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*submitted in partial fulfilment of the requirement*

*for the award of the degree of*

*Master of Computer Applications of the*

*Visvesvaraya Technological University, Belgaum, Karnataka*

*bonafide work carried out by*

**BHARGAVI S**

**1CR18MCA57**

*during the academic year 2019-2020.*

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Name of the Examiners

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Signature with date



**NUMEN TECHNOLOGY**

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Date- Jan 12,2020

**PROJECT COMPLETION LETTER**

We hereby confirm that Ms. Bhargavi S of your college CMR Institute of Technology with USN: 1CR18MCA57, has successfully completed the Project at Numen Technology Pvt. Ltd. 12th Jan 2020 TO 10th June.

The Project based on Python with the title --Time Tracker System Using Face Detection --under the guidance of Miss. Shruthi, Project Guide, Numen Technology Pvt. Ltd, Bangalore 560037

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## DECLARATION

I, BHARGAVI S, student of 6th MCA, **CMR Institute of Technology**, bearing the USN **1CR18MCA57**, hereby declare that the project entitled "**Time Tracker system using Face Detection**" has been carried out by me under the supervision of External Guide **Mrs. Shruthi**, project Manager, and Internal Guide **Dr. V. Ilango, Professor, Dept. of Master of Computer Applications** and submitted in the partial fulfilment of the requirements for the award of Degree of Master of Computer Applications by the **Visvesvaraya Technological University** during the academic year 2019-2020. The reports has not been submitted to any other University or Institute for the award of any degree or certificate.

Place: Bangalore

BHARGAVI S

Date:

(1CR18MCA57)

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**BHARGAVI S**

**(1CR18MCA57)**

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# CHAPTER 1

## INTRODUCTION

### 1.1 Project Description

The major goal and purpose of this Time tracker system the use of face discovery is to offer fascia recognition in real time situation for any corporation, organization or a enterprise to observe along with mark the attendance of their students or employees on a day by day basis to keep song of their presence. The device will spot and record the tracked information in any setting.

The main and basic idea behind the pretence finding technique is that facial color recollection. Human skin consists of a wide range of colors. Persons can detect those choice of ensign. After detection we have to keep track that in order inside the database. we can confine the mug by using cameras.

This system is a physical characteristics identification arrangement, physiological features of human can be considered as a main factor for face detection system. These features may be pelt color, eyes, nose, lips, and other areas on appearance. this gadget identifies the individual tackle in picture format. It will be a psychosomatic method by means of which creature beings can find and attend to the impression in a visual scene.

In the Face exposure approach we know how to see two applications such as Identification and Verification. Identification is nothing but whenever the portico likeness is given we have to tell the device that he/she or else the most possible classification. Facade confirmation means that the guess of the facade credentials of the given visage icon the machine should notify true or false regarding that speculation. The core intention of an utility is to afford automatic scrutiny of video flow to become aware of suspicious occasions in actual time. Real time exterior innovation tool can distinguish and tune a couple of manifestation in its field of view and follow it. Whenever Devices detects air of a soul it will show his or her personal or related information.

These days biometric configuration are using to discover the physiological features for security. These structures predicts that it will likely be there indispensable part of refuge systems. Because of this motive in future populace won't must bring the cards or commit to memory their passwords.

Sanctuary is one of the major thing at the moment. So that in this safety technology was entered so many days before only. In any educational institutions, banks, organizations, corporate world the utilization of vision based makeup are used to keep track on all the activities going on that particular place. The project will captures the frames from the camera, detect the faces and stores them in the database and follow lying on that stored details.

The visage recognition understanding tin can be considered as a precise holder of object-class exposure. That was a process of finding the sizes and locations of all the objects in the class. It is mainly focuses on the frontal human faces. It will suit the photograph little by little with the details stored inside the record.

The applications of this proposal can be used in Facial recognition, Fascia motion detain, cinematography, advertising, expressive inference, Lip appraisal etc...They may also detect the features of the faces such as eyebrows, the nostril, the iris and the mouth corners. So many algorithms were used for developing this usage. This project is mainly developed using python. In order to track the faces, we have to first detect the features in the image.

Time tracker gadget is considered one of the PC software that lets in its personnel to report time spent on the tasks. This is a tool might be used stand-on my own or to be integrated with the alternative Applications. This software program will automatically document the activities done on a laptop. It is used to song the time and generate the Reports.

OpenCV is that the hottest library for pc vision. OpenCV uses appliance mastering algorithms to look for faces inside an image. Because expression are so complicated, there's not one simple check in order to tell you if it discovered a face or not. Instead there are thousands of small patterns and capabilities that were given to be matched. The Algorithms wreck the undertaking and figuring out face into heaps of smaller, bite-sized responsibilities, every of which is straightforward to untangle. These Responsibilities are also known as classifiers.

For incredible kind of a facade, you would probably have 6,000 or extra classifiers, all of which have to be equivalent for a face to be detected. But therein lies the problem: for mug finding. This permits the device to extract countenance more powerfully and perfectly, we need to narrow the range of face detection first, and consequently the performance of the look revealing technique can't be too low.

We can say portico uncovering as a challenging mission because the faces in the images are uncontrolled. Before this, the given input image will experience the pre-processing section to enhance the picture excellence such as Grayscale conversion, histogram equalization, Image resizing. In this arrangement face recognition is an important step, it is like delegate as well as typical relevance in workstation vision. This deal will be mainly focuses on the target object in the illustration because it may have bunch of variations, facade distinction, facial occlusion. In this coordination main factor to be consider is that in the direction of employ the typical trial data for researchers to measure up to the outcome. Currently this kind of systems can be using in many fields and these technologies are gaining more popularity because of human interest.

The capability to automatically identify the person's outer shell supported energetic facial imagery is crucial within defense, scrutiny and hence the fitness or independent living domains. Particular applications include admission to a steady environment, identity of the community next to a selected location and interloper detection. Explore proposes the right time gadget for scrutiny of the usage of cameras. These form of systems can be used within the restricted areas, which include next to the workplace or the residence of a suspicious individual or by the side of the doorway of a touchy-feely fitting. The structure works efficiently, perfectly below sensible lighting surroundings and photo depths. This logic contains a quantity of the methods such as acquiring, dealing out and reading the similes and other excessive dimensional information to produce numerical or symbolic information in order. The chief components of face detecting framework are fundamental imaging and cascading.

When we work with face acknowledgment scheme the algorithm desires the positive snap shots and negative pix to teach the classifier. later on we ought to extract the capabilities as of it. Computer vision model to detect the face within the primary frame of a video using pre-trained detector and to continue tracking it within the rest of the video frames using Camshift, particle filter , Kalman filter tracker. Particularly this project was developed in python language. Here we used Tkinter for the front development it provides the components required for the project. Latest version python3 was used here. This system will reduce the time of individuals, reduces burden of an organization or a company, this system is like attendance management system it will tracks all the persons.

### **Problem Statement:**

Software is to be developed for the Time tracker system by face detection using python pillow. The structure should be standalone. It ought to have a breakthrough client interface to construct it easy for the public working on it.

### **FACE RECOGNITION:**

The field of Face recognition could be defined as a research area in which images of faces are grouped into sets belonging to one personality. Maybe it is easier to understand if we use Face-book as an example. In the past, Facebook was capable of detecting face, but then the user had to tag the per-son by clicking on the image and specifying its name. Now Facebook has the capability to tag everyone in the reflection automatically. This is achieved by Face recognition algorithms. In Python this task can be achieved using pre-trained convolutional neural networks and OpenCV. The whole program relies heavily on various libraries. So modules paths, face credit, arg parse, picle and OS have to be imported into Python project. At first, some descriptions of the person we wish to acknowledge must be collected. This can be done either manually, or by the application of the Microsoft's Bing API for searching. Ideally, the dataset should contain at least 3 metaphors of each person. No other persons ought to be present in the similes used for training. The community architecture used for face popularity is primarily based on ResNet-34 neural network. The Python's visage credit library however has fewer layers and the variety of filters is reduced by with the aid of half. The network turned into trained on a dataset of approximately 3 million descriptions.

## **1.2 Company profile**

NUMEN Technology private limited is a private company incorporated on 11 December 2000. NUMEN Technologies is a premier new-generation niche-skill training organization, headquartered at Bangalore, India. It is prompted and managed by highly experienced professionals who have decades of experience in the IT industry.

It is involved in software publishing, consultancy and provide. NUMEN Technology gives the unique and advanced techniques with combinations of courses as per your requirement and the industry demand. They also assure you the knowledge with perfection with real-time case scenarios.

With their industry-relevant and industry endorsed curriculum, their participants are going to be the foremost sought out IT professionals within the year to return. NUMEN Technologies has alliances and partnership with leading technology companies to supply globally recognized training programs. The courses provided here are oriented to international certifications.

NUMEN Technologies, is in a completely unique pose to offer on-web site and online, anytime-anywhere education to clientele throughout the country via its committed crew of specialist who cater to the anxiety of the clients. NUMEN technologies use its broad expertise to introduce new studying methods, create schooling content material and deliver top first-class communal edification.

### **1.2.1 Numen technologies provided:**

- Big data
- Data science
- Digital marketing
- Cloud computing
- Java
- Block chain
- Devops
- Android & IOS
- IOT

- Programming languages
- Software testing
- Database management
- Web development
- Robotics

### **1.2.2 OUR MISSION:**

The companies short-term mission is to build technology -enabled solutions to solve some of the problems in wildlife conservation. Long-term vision is to create a wildlife technology platform for scientists, zoologists, students to create, share and monetize digital conservation assets. In today's globe each companionship depends on era to maintain business operations allied, drive revenue and aid ever developing consumer demands. Numen technology has been constructing software program for various industries. This industry enterprise has labored with many era structures and has collaborated with several teams.

### **1.2.3 Philosophy:**

Numen Technology understands what customers are looking for and we are highly committed to delivering excellence to their participants and their clients. With an insight of the newest technologies and best practices in effective delivery, we address the enterprise training need with a singular combination of design expertise and enterprise training knowledge gained from our vast experience..

### **1.2.4 Process**

- ✓ Understand our client's Domain Expertise and Technical Competency
- ✓ Evaluate training need
- ✓ Analyze existing skill levels
- ✓ Comprehend the expected skills which must be imparted
- ✓ Prepare a comprehensive training solution and design a curriculum after interacting closely with all the stakeholders
- ✓ Deliver training through our highly experienced trainers with daily monitoring. comprehensive tests, real-world assignments and periodic feedback.

- ✓ Measure training effectiveness post training and provide trainer feedback of participants, if required.

### **1.2.5 Trainer's expertise**

Numen technology has a network of more than 250 trainers spread across multiple locations with strong experience and skill-sets to handle the design and delivery of enterprise training solutions from induction trainings to calendar trainings to lateral programs on fundamental skills to niche skills. NUMEN technology supply project-based guidance wherein the trainer receives coupled with contributors and assists them while they may be using the tools.

### **1.2.6 The NUMEN Technology Edges:**

- NUMEN TECHNOLOGY have a distinctive position to grant on-site, any-time, anyplace preparation to patrons across the nation through its dedicated team of experts who outfit to the burden of the company.
- The corporation's instruction facilities are well outfitted with state-of-the-art, infrastructure and skilled and competent.
- NUMEN Technology uses its sizeable know-how to introduce new erudition methods, form working out content and deliver fantastic corporate education.
- NUMEN expertise provides project-primarily based tuition in which the teacher gets related to participants and assist them while they are the usage the tools.

### **OBJECTIVE:**

The corporation idea is to widen in a constant way and grow up as a main IT service provider to turn into a number one performer, in providing quality Software Development answers in the spirited overall market place. The professionals, bendy and integrated procedure reflects in what firm does. The employer always direct the customers fulfillment. The organization may have the potential to speed up and quickly proportion the first-rate paintings or products of institute or business. The synergy of what NUMEN does come from a blend of ardor for success and the talent to help hasten the agency.

**SERVICES:**

NUMEN EXPERTISE offers a full series of facts management services that may be shared with our present statistical proficiency to provide a value-introduced imparting to our classes. We grip the clinical research of all sizes, from Phase 1-4, in FSP mold is designed to ensure well-timed transport of each regulars Hiring requirements.

- Teams focused on individual clients.
- Cost-effective
- A vast network of training and other Consultants in Tier 2, Tier 3 cities, and the town of the states.
- The vast network of Freelance recruiters has enrolled apart from permanent staff.



## CHAPTER 2

### LITERATURE SURVEY

A literature survey involves a detailed study of the existing system and limitations. To overcome the limitations the requirements are reanalyzed and a new system is proposed. The new proposed system must provide more facilities than the accessible system by residing in the same constraints.

#### 2.1 EXISTING SYSTEM AND PROPOSED SYSTEM

**Existing system:** Various face revealing performances are developed more than the last few decades. Pixel primarily based pores and skin exposure has a lengthy history, however, exceptionally a small number of papers that give surveys or comparisons of deferent strategies had been posted have provided a contrast of negative color spaces. Have evaluated three deferent skin color modeling strategies additionally have as compared two most well-liked parametric pores and skin fashions in deferent chrominance places and feature proposed a version of their own. If manually enter the details requires more time therefore time complexity is more.

- Manual entry based system for Time in and out for users.
- Business to consumer application

**Proposed system:** Skin coloration principally based face detection algorithm fails to hit upon the face at the circled expression clause. However, in many real-international applications, the local arrangement is further vital so we make available an effective system for look detecting. Here we endorse the elevated robust features finding method. To sense a countenance vicinity in the variously restrictive figure, we used complexion revealing, that's a rule-based set of rules. Compression can make confronting each other communication be realistic in real-planet applications. However, superior bandwidth leftovers exceedingly demanded thanks to the mounting rigorous conversation. This system automatically recognizes the people and enter information in the database. The scheme will not make any mistakes.

- Using this for Time entry and out for persons.

## **2.2 FEASIBILITY STUDY**

Preface investigations look at venture feasibility, the probability of how the arrangement is a force be helpful to the group. The study determines if a new proposed system was beneficial on the way to the organization or not. The classification does not count if it's not useful to the association. In analogous, the wisdom also determines if the course of action can be built fittingly and exactly on time with on-hand assets meeting all the constraints. Face detection is strictly viable because user simplest require internet camera to employ the coordination. Similarly, it's far operationally sufficient because this technique is clear-cut to apply.

It is a revision of whether or not, no longer the project is appealing doing. The route that follows this fortitude is called a Feasibility cram. This learn is taken in proper time constraints in addition to generally culminates in a written and spoken achievability testimony. this could be labeled in quite a lot of types, they are

### **2.2.1 TECHNICAL ANALYSIS**

This evaluation cares with specifying the software-program which will fruitfully fulfill the addict necessities. The methodological wants of machines are to have the talent toward craft the output in a given time and the reaction instance underneath the sure state.

### **2.2.2 ECONOMIC STUDY**

Economic psychoanalysis is that the most habitually worn practice for evaluating the helpfulness of prepared devices. This is referred to as Cost/Benefit analysis. If the reimbursement overweighs the significance, then the choice is taken to the setting up the stage and implements the organism.

### **2.2.3 PERFORMANCE INVESTIGATION**

Psychiatry is stood on the whole concept of an approach it is also a very imperative investigation. If the assay proves to be pleasant from the company's facet then this scrutinizes fallout moved to the subsequent inquiry segment. If the trouble is noticed out then it could be rectified.

#### **2.2.4 EFFICIENCY ANALYSIS**

These lessons specially deal with the proficiency of the mode supported this assignment. The possessions required by the course to carry out a selected function are analyzed at some stage in this part. It likewise tests how well-organized the task is on the formation, despite any modifications in the composition. The performance of the appliance ought to be examined in such a manner that the abuser should not undergo any differentiation in the means of working. Further, it must be taken into consideration that the mission on the order needs to remain for an extended time. Then, to tune the region, we applied tracker algorithms which have robustness for rotated facial illustration. In the untried upshot, we levy the recital off ace tracking algorithm, which's robustness in a revolution.

## **2.3 Tools and Technology Used**

### **2.3.1 Python3**

Python's layout viewpoint emphasizes code clarity with its noteworthy utilize of great whitespaces. Python can also be a complex-stage, interpret, interactive and object-oriented scripting language. Is meant to be exceedingly readable. It could still be a general-purpose top-level programming dialect. Its helps numerous encoding paradigms, consisting of ritual and well-designed indoctrination. python may be MUST for college kids and dealing professionals to become an excellent programmer specially just the once they are running in web growth area. Which endow with very lofty rank dynamic essential varieties and alleviate lively type inspection it. Which lend a hand for automatic garbage lift up. python's mass of the library is tremendously transportable and cross-platform like minded on UNIX, Windows etc. And its ASCII text document within reason is literally easy-to-maintain.

### **2.3.2 OpenCV**

It is by far the most universally used processor vision annals. And is printed in c/c++, other than Python bindings are supplementary at some stage in the installation. Which also gives magnitude on concurrent depiction dispensation. Among ones, which will not be presented it might be worth mentioning ilastik. OpenCV invent to furnish a average infrastructure for supercomputer visualization attention and to hurry the consumption of contraption perception contained by the commercial products. In the direction of real-time revelation packages and takes improvement of some advices while vacant.

### **2.3.3 PANDAS**

Pandas may be a influential specifics schoolwork collection provided that flexible thanks to do data manipulation. here are many arithmetic and systematic computational facial appearance are often leveraged by means of this account. pandas is largely used for machine gaining familiarity in outline of statistics frames. Pandas permit importing in turn of varied article configurations akin near csv, excel and so forth.

### **2.3.4 NUMPY**

NumPy is a ordinary-cause array-allowance pack up. It was the elemental privilege for methodical progression with python. which furthermore may well be used as an proficient multi-dimensional urn of nonspecific particulars. NumPy's focal thing be that the homogeneous multidimensional array. it also discusses the varied selection functions, sorts of indexing, etc. An advent to Matplot lib is as well provided.

### **2.3.5 TKINTER**

Tkinter was that the usual GUI store for Python. Python when united with tkinter imparts a swift furthermore undemanding appreciation to create GUI application. Which will bestow a burly item-oriented boundary to the Tk GUI toolkit. Tkinter give a choice of controls, in the vein of button, labels and text-boxes utilized in a GUI request. This gives the components to create front end. And is open-source and available under the python license. python by means of Tkinter is the best ever and easiest means to construct GUI claim.

### **2.3.6 MYSQL**

SQL lets you access and manipulate databases. Which is a processor words for stock up, manipulating and retrieving evidence accumulated all through in a electronic folder. Whenever you executing an SQL commands, the makeup determines the best approach to bring out your appeal and SQL engine figures away the way to interpret the chore. A table may be a anthology of linked reality entries and it consists of column and row.

### **2.3.7 PIL/PILLOW**

This library is mainly appropriate for image manipulation (rotation, resizing, etc.) and very basic image analysis.

## 2.4 HARDWARE REQUIREMENTS AND SOFTWARE REQUIREMENTS

### 2.4.1 Hardware requirements

In the process of developing a particular project in real time system or environment. It is necessary that some basic requirement should be fulfilled by the application. A hardware necessities list be recurrently accompanied by means of a hardware compatibility listing, principally in case of operating systems. These supplies encompasses minimal processor swiftness, memory, and disk area requisite to install windows.

Computer processor	Intel Core i3 (equivalent or greater)
Computer Hard disk	100 GB (Recommended)
Computer RAM	8 GB or greater
Speed	3.20 GHz or higher
Camera/Webcam	

### 2.4.2 Software requirements

Make certain that to pursue the suitable tactic of installing the software in the composition and besides go after the guidelines of hardware must be attuned with the buildup. A situation or else functionality that need to be met otherwise possessed by a engine element toward meet a contract, standard, condition, or other legitimately imposed certificate. This phase is a user-dominated segment and interpret ideas or views into a chunk file.

Operating System-OS	Windows 7 and above
Tools	Python 3, Mysql, PIL, OpenCV, pandas, Tkinter, NumPy

## CHAPTER 3

### SOFTWARE REQUIREMENT SPECIFICATION

A Software necessities condition may be a portrayal of a operating system to be urban. It's modeled after industry necessity measurement, also called stakeholder supplies obligation. Which establish the thought for an harmony among customers and service provider or dealer on how the software box up must function. The aim of this technique requirement specification is describing the safety system which is named biometric authentication supported Face and iris recognition.

#### 3.1 FUNCTIONAL REQUIREMENTS

Functional provisions are statements of the offerings that the scheme have to present or are the metaphors of how a quantity of computation be obliged to administered. The map for employing serviceable materials is detailed inside the system blueprint. These are features of the arrangement will need so as to deliver or operate. These are gathered from the clients during meetings and a few are outlined here.

- A well-informed HD Camera.
- Faces on a portrait ought to be detect.
- Detecting countenance in border boxes.
- lay up the cropped look to a folder.
- Fill fascia on documentation.
- Teach expression for gratitude.
- compute recognition price of the structures.
- Recognition are often accomplished through face detector.
- Exhibit the key icon next to yield illustration side by side on an correspondent conspire.
- An best the legal user need to be clever to use the device.
- The awareness must be entered and managed properly.

### 3.2 Non-Functional Requirements

It may want to even be a insist that specifies customary which may be wont to moderator the operation of a organization, as opposed to definite behaviours. This may be contrasted with purposeful chunks that outline unambiguous actions or jobs. These necessities are collected sustain the subsequent after meeting with the punter. They cover trouble-free use to the consumer reminiscent of sanctuary, support accessibility, operational rapidity, and realization consideration.

Some are:

- The classification is extremely secure.
- The system are frequently effortlessly fixed.
- Is 100% good at your job.
- It must be speedy and unfailing.
- Ought to put off data exploitation.
- System be supposed to have a utmost uptime.
- Shall be blunder-free.
- Should maneuver in synchronized.



## **CHAPTER 4**

### **SYSTEM DESIGN**

It is the routine of significant, increasing and conniving harmonization which satisfy the strict wishes and supply of a big business or society.

#### **4.1 System Perspective**

System plan is involved with how the structure functionality is to be afford with the aid of dissimilar workings of the method devise is the solution segment of any venture. It is the step one in touching from quandary field to the answer area. The input to propose stage is the specifications of the system to be designed. The production of the pinnacle level design is the architectural drawing, or this coordination intend for the method to built. A blueprint should exist very clear, verifiable, complete, traceable, green and simple.

The software development process can be defined as a collection of phases portraying the various procedures in the development process. Structure perspective involves the performance and functionalities of the means which would describe the cataloging.

This can be defined as an initializeial step for identifying the solution from the start of the problem. The design know how to be defined as an intermediary between the stages of implementation. The output at this stage is a blueprint of the document. In the view of a plan one should not consider the system as an isolated entity.

The organization perspective defines the functionalities and relationships between the environment and the adroitness. It defines how each module in the system communicates interactively to produce a complete solution to the problem which was identified.

The main goal of SDLC is identifying and upgrading the requirement of a method in to code. Here we basically define how different modules of a system communicate and what the dependencies between each modules of the composition are.

## 4.2 CONTEXT DIAGRAM

The Context diagram suggests the device into consideration as one advanced practice then indicates the bond that arrangement has with other outer entities. Therefore it shouldn't be mystified with a flowchart or process pour which may illustrate this possessions.

Various of the blessings are:

- Shows the scope and confines of a classification at a glance such as the other technique that crossing point with it
- No practical awareness is understood or required to discern the graph
- Effortless to depict and alter thanks to its imperfect details
- Can benefit an awesome listeners plus stakeholders, business forecaster, facts analysts, developers.

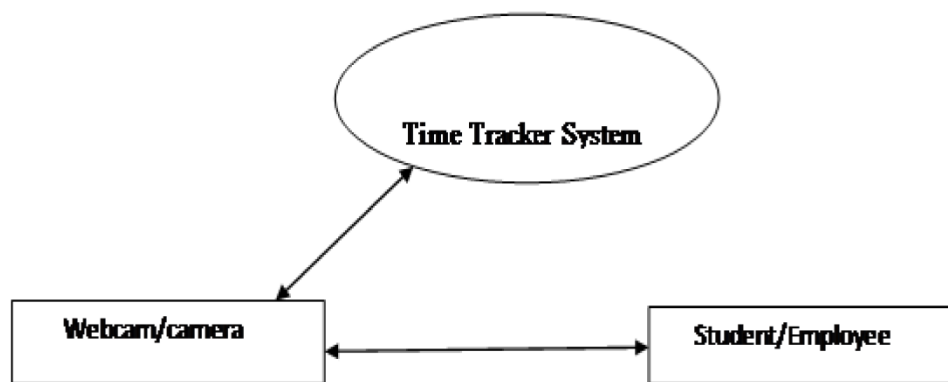
A context diagram, occasionally known A level 0 record-glide figure., is strained so as to label and elucidate the borders of the software. It identifies the flow of information between the structure and peripheral entity. The complete software is revealed as one method. Having agreed on the evaluation of scaffold, the meticulous exploration of the present coordination must be premeditated. This involve categorize how each of the spot incorporated within the span are going to be scrutinize. Key abuser are acknowledged and their explicit roles inside the research are agreed. Habitually the foremost tricky aspect of receiving this chart right is selecting the assets depict. Context diagrams really reduce challenge hazard because they're clean for a team's enterprise companions to recognize.

In tidy towards deliver the context diagram and concur on device compass, the successive must be diagnosed:

- exterior entity
- records-stream.

The mission sponsor frequently have strong estimation as to whom in the firm they are willing to splurge money to help.

This diagram represents the context diagram of this project where it shows the overall view that how the system will operate and also processing architecture. Mainly for the database, camera and students or employees are key contemplation. when webcam detects an image of worker/ scholar it will store within the named directory along with time and date. It gives abstract demonstration of tracker structure model. There is no duplication attendance was recorded in the folder.



**Figure 1: Context Diagram for Time tracker system using Face Detection**

## 4.2.1 DATA FLOW DIAGRAM

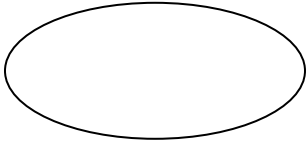
A data-flow diagram may well be a means of representing a go with the flow of a comprehension of a practice or routine. The DFD besides grants records concerning the outputs and inputs of every unit and thus the manner itself. A information- illustration has no manipulate waft, there aren't any verdict policy and no loops. Definite operations supported the info are often symbolize by means of a flowchart. The statistics-waft drawing is a component of the structured-evaluation modeling tools. A special nature of data-flow plan can be a site-oriented record-flow map. Data-glide schema hastily became a admired thanks to imagine the most important ladder and facts involved in software-device procedures. It's one amongst the imperative modeling gear. It proves the customer of the tidings pictorially. DFD represents the current of the news sandwiched between unlike variations and progression within the machine. The figures gush graph be evidence for logical drift of records. It signifies the well-designed dependencies within a arrangements. It illustrates amount produced values at some point in a calculation are derived from enter standards. It's sort of a plain depiction or model for classification behavior. It tells the logical structure of the format. It narrate specifics in order to varied exercise of the system. It pursue top-down approach.

Essential flow register notations:

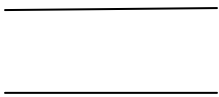
### DATA FLOW:



This indicates the float from record-to-record or record-to-system or process-to-process. It's normally in provisos of attributes. There should flat be moreover an key in figures pour or output facts go with the flow.

**Functional Process:**

PROCESS is nothing but the renovation of information it begins with the focus and it's miles the verb observed by way of the situation.

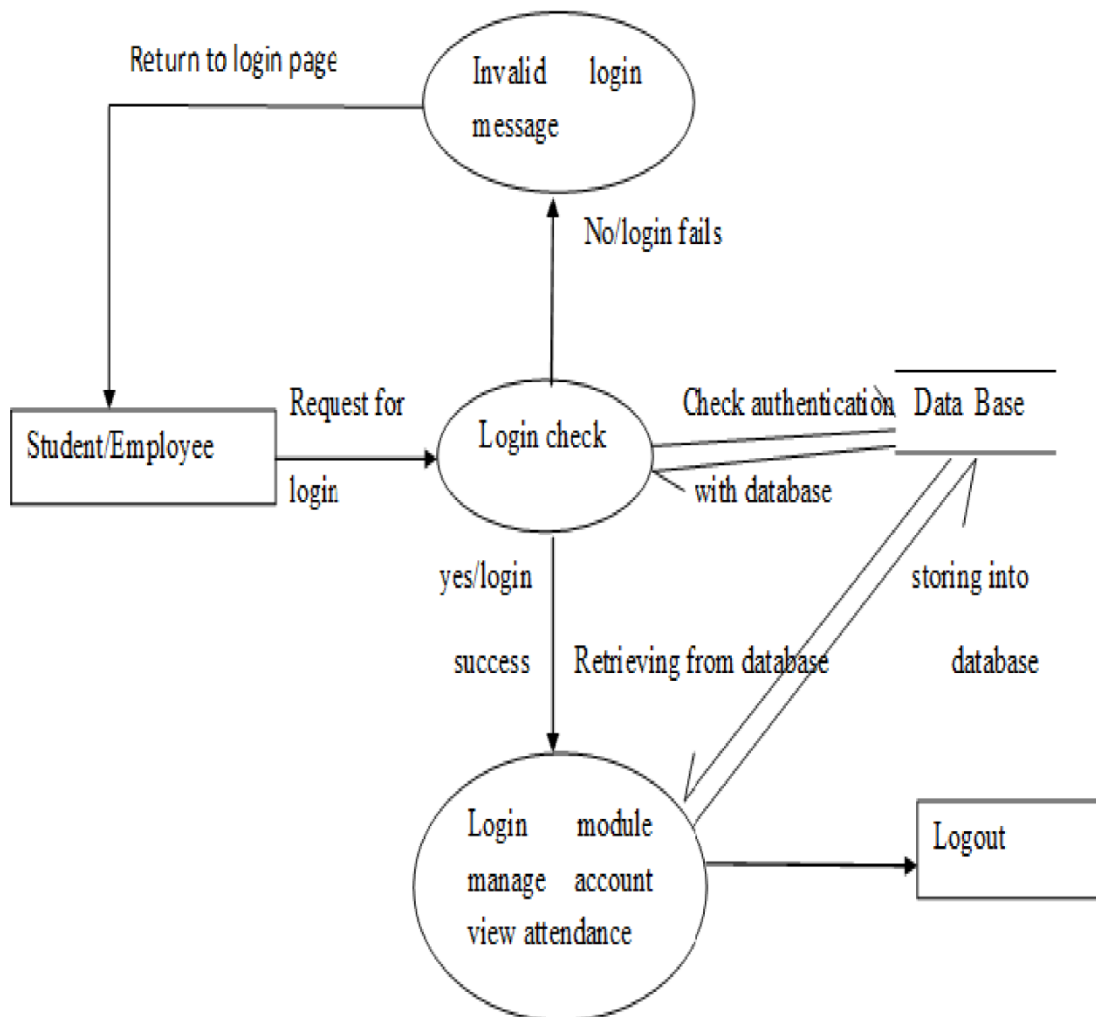
**Data Store:**

It embrace sleeve, report base and repository. To parallel strains corresponds to it or a 1 quit closed rectangle.

OR



The following map signifies the flow of information from one module to another. Whenever an user login into a device webcams will senses the pictures with various adjustments and mark the details within record. This process of working was illustrated in this flow chart. Arrows shows movements that signifies how the progression of the system works. By this one can understand the working mechanism of the entire structure.



**Figure 2: Data flow Diagram for Time Tracker system using Face detection**

## **CHAPTER 5**

### **DETAILED DESIGN**

#### **5.1 USE CASE DIAGRAMS**

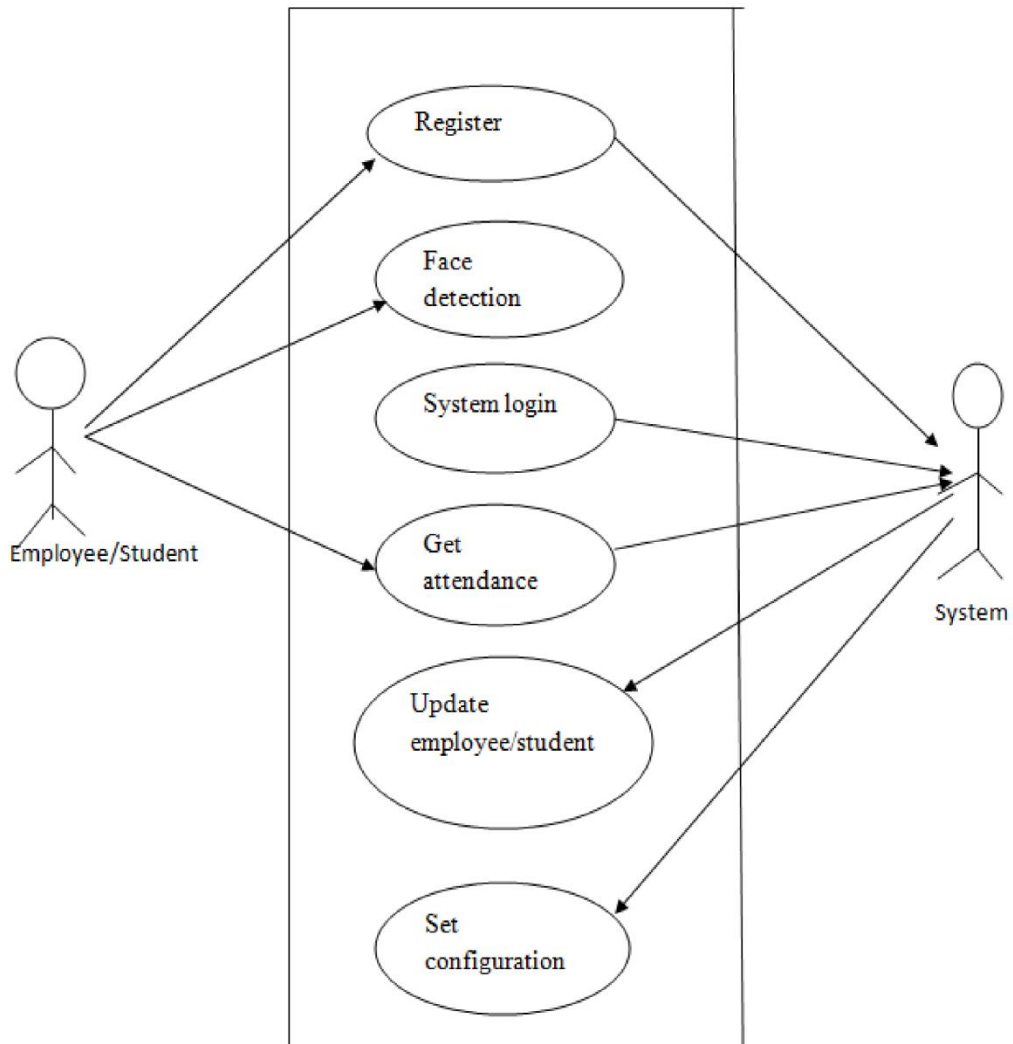
It defines relationship among the user and the system. It mentions the use cases where the consumers is to be involved, they are used to collect necessities of a coordination. With the aid of this diagram the requirements of a system are observed and recognized. An Use case diagram at its best ought to also be a demonstration of a customer's interplay with the machine that displays the correlation between the person and for this reason the diverse use-cases in wherein the abuser is mixed up.

A use case plan can discover the varieties of addicts of a device and consequently the exclusive use cases and can regularly be amid other class of graph also. The illustration hired to version the system/subsystem of an application. A solo use case chart confine a particular functionality of a scheme. Which are wont to congregate the wants of a method together with inner and outer influence. These supplies are more often than not layout necessities. Hence, whilst a machine is considered to accumulate its functionalities, use instances are geared up and actors are acknowledged.

These are taken into consideration for peak level prerequisite study of a approach. The second obsession which has relevancy to employ belongings are the actor. Actors are frequently defined as something that work together with the organization. Actor are often a person's user, some domestic relevance, or could also be a few outdoor applications. When we have become to attract a use case diagram , we should for all the time have the consequent substance recognized.

To apprehend the dynamics of a structure, we'd like to utilize opposed manner of drawings. Use case figures certainly one of them and its precise intention is to gather orderliness rations and artists. But this never portray how they're instigated. They are often imagined as a recorder where most effective the say, yield, and so the occupation of the recorder is to be understand.

The schema is used at a virtually excessive degree of aim. This elevated plane propose is polished again and again to insist on a whole and handy photograph of the technique. These superfluous elements are wont to compose check instances whilst performing the testing.



**Figure 3: Use Case Diagram for Time tracker system using face detection**



## 5.2 Sequence Diagrams

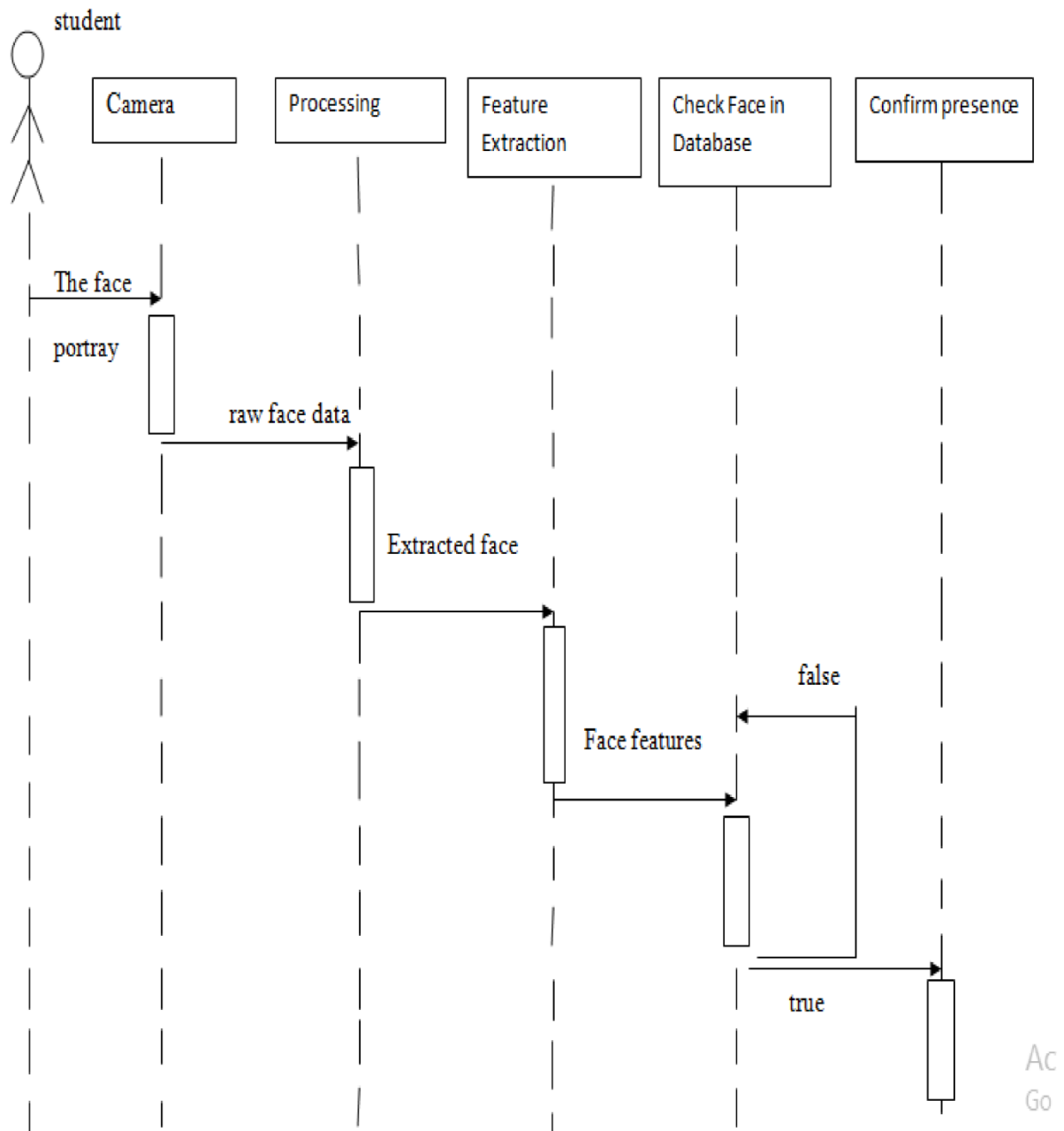
It's far the drawing which represented the flow of interest in a sequential way. The interplay of the objects are being illustrated. The diagram represents the sequential waft of the messages which is being exchanged from one object to the alternative. Sequence diagrams are characteristically related to use case realizations in the coherent sight of the scheme underneath improvement.

An interaction figure is working to factor out the interactive deeds of a routine. Since visualizing the connections in a arrangement can be bulky assignment, we use dissimilar mode of dealings to seize a mixture of facial appearance and element of contact during the arrangements. chain illustration explains how and in what order the items all through a machine function. These are widely engaged via businessmen and software developers to document and be aware of necessities for logo spanking new and offered skills.

The running mechanism of synchronous memo is wait for a retort previous to the communication can move frontward. The sender waits awaiting the receiver has done the processing of the message. The caller persists handiest it knows that the recipient has processed the preceding note. it receives a react significance. A hefty digits of calls in thing oriented indoctrination are synchronous. We might also use a frozen dart head to symbolize a synchronous point.

An asynchronous memorandum does not watch for a counter from heir. The relations movements forward anyway of the addressee processing the earlier implication or no longer. We can use a covered arrow head to embody an asynchronous message.

When the camera identifies the features then it will match that with previously registered data, if it matches then mark the attendance. The captured face must be recognized for processing. All employees should confirm their presence with this construction. This diagram shows the different modules involved in the practice. Data transformation can be easily understood by this drawing flow.



**Figure 4: A Sequence diagram for Time tracker system using face detection**

### 5.3 Activity Diagrams

Activity diagram may be described as a flowchart which depicts the glide from one pastime to every other pastime. It essentially defines the sequence of steps that's followed to perform an activity.

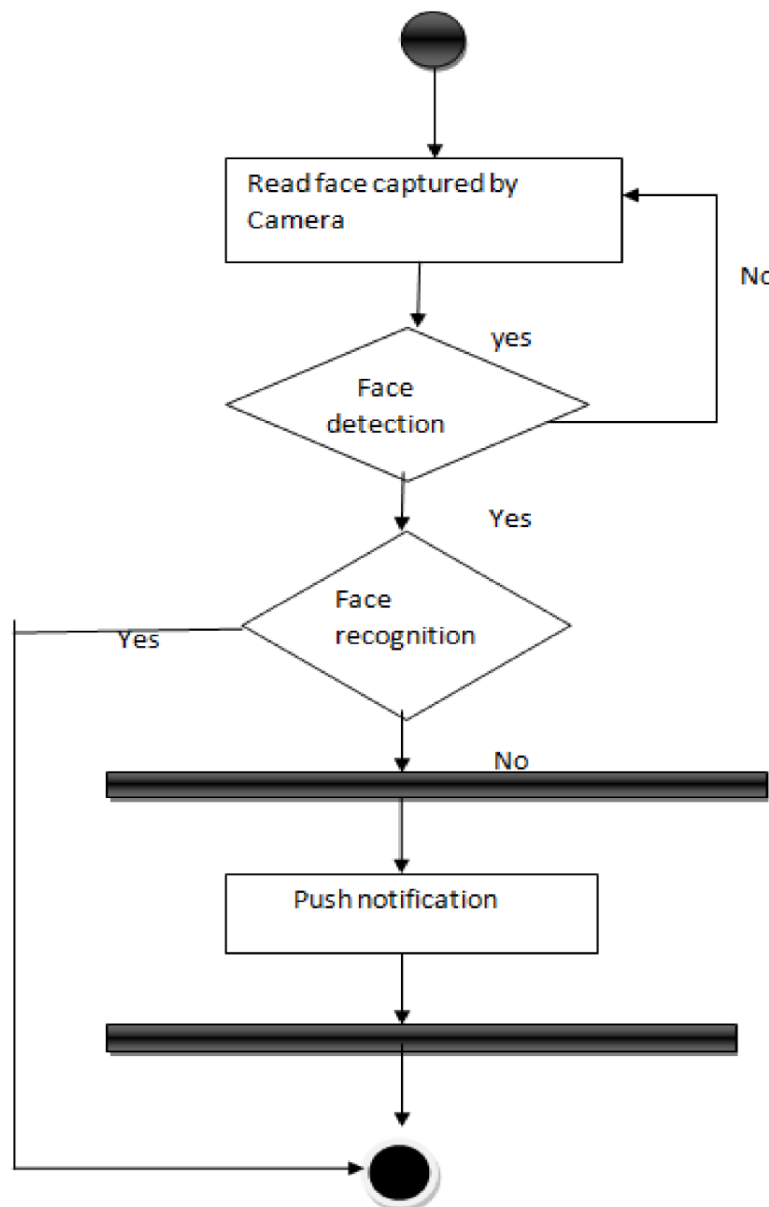
- Diamond symbol represents the action
- Begin of the manipulate go with the flow is indicated by means of the stable circle.
- Strong circle inside the whole circle represents the termination of the control Flow.
- Arrow is used as connector among collection of activities.

Activity sketch tells how tricks are coordinated to contribute a deliver a carrier which may be at unlike tiers of concept. Typically, an incident need to be a done by few actions, predominantly where the maneuver is destined to realize multiplicity of assorted effects that need dexterity, or how the trials during a solitary use case narrate to at least one another, specially, utilize cases where activities may extend beyond and necessitate harmonization.

We tin say together sequential dispensation and concomitant dealing out of activities by means of an hobby drawing.. They be operate in industry and route modeling wherever their principal use is to depict the lively components of a scheme.

These illustration are repeatedly exploit in enterprise technique model. They can moreover explain the stepladder all through use case plan. behaviors mock-up can be in order and concomitant. In mutually of these gear an motion chart will have a start and an ending state. Activity diagrams be recurrently measured a species of a prearranged flowchart united with a typical records run chart. Representative flow map procedure lack construct for convey concurrency.

These diagrams have start and end nodes. Here processing will be represented in the rhombus-shaped configuration. The flow of statistics ought to be denoted as an arrow symbol. At whatever time the system spots the face if he/she was not registered then it will show the notification and ask them for login. They should do the registration with their unique id given by the organization.



**Figure 5: Activity Diagram for Time tracker system using face detection**

## 5.4 ER Diagrams

ENTITY RELATIONAL MODEL may be a top-stage abstract record version diagram. ER modeling facilitate you to research information supplies methodically to give a well-designed catalog. The Entity-Relation model signifies real-world entities and consequently the affiliation stuck between them. It is taken into consideration a unsurpassed practice to finish ER replicating earlier than implementing your database.

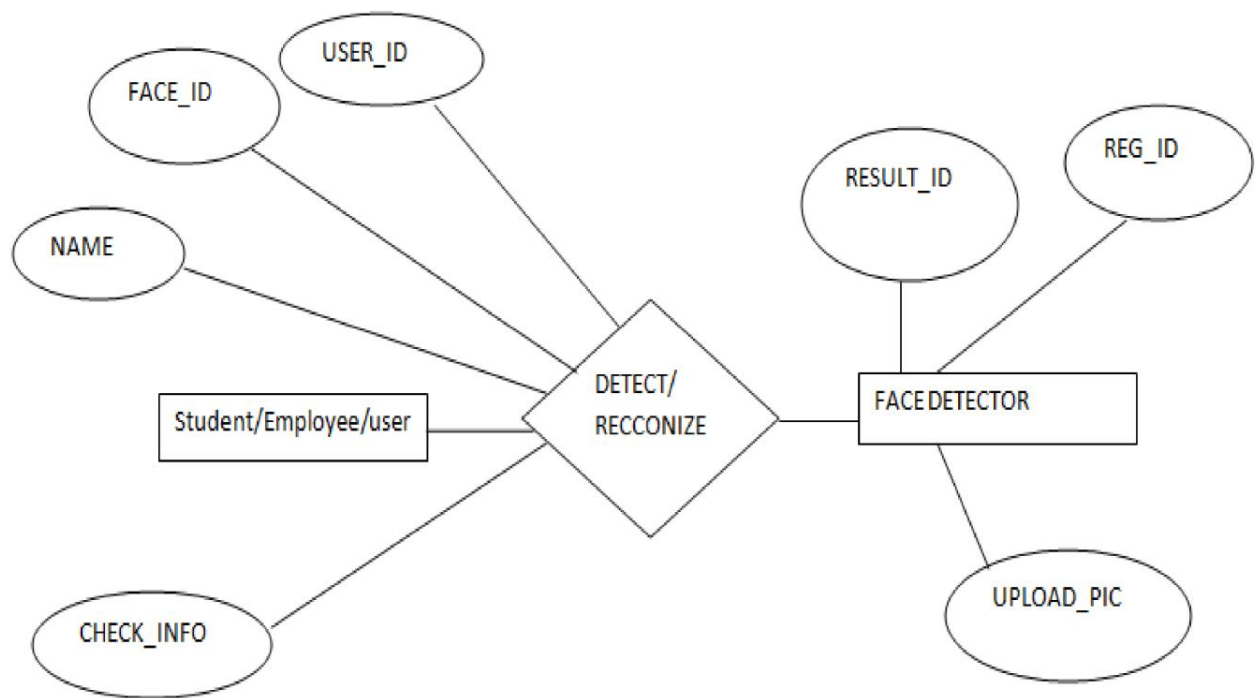
ER mock-up lets you to research in turn requirements steadily to supply a well-made categorizer. So, it's careful a finest observe to conclude ER copy before imposing your file. Data base is completely an integral a part of software systems. This sculpt besides bestows a means for communiqué.

An Entity are often any item, situate, human being or division. Believe an exemplar of an Association- worker, director, branch, artifact and a lot of new can be taken as entities in an Organization. Relationships are epitomized by diamond-twisted box. Forename of the correlation is printed inside the rhombus-pack. All the units participating at some point in a affairs, are joined thereto by a stripe.

Here are prime reasons for using the ER figure :

- Assist you to classify provisions associated with entity liaison mold.
- Offer a preview of the way all your tables ought to connect, what pastures are getting to obtain on each one stall.
- Rally round to portray entities, aspects, dealings
- ER drawings are translatable into relational slabs which tolerate you to form lists swiftly.
- ER schema are habitually engaged by directory designers as a blueprint for instigate facts in exact software relevance.
- The folder creator gains a far superior thoughtful of the comprehension to be enclosed contained by the record with the backing of ERP map.
- ERD is authorized you to talk with the valid formation of the notations to abusers.

This entity diagram describes an employee belonging to a branch conserving the admin position logging into a consumer account. He can pick out to make enrollment of a new worker. A member of staff registers attendance in addition to his income calculated based on attendance and Wage per day.



At

**Figure 6: ER Diagram for Time tracker system using Face detection**

## **CHAPTER 6**

### **IMPLEMENTATIONS**

Implementation is the phase of software development in which all the analysis, planning and designs come together, concluding into a software product. The development testing teams sit together alongside the team involved in the analysis phase and write out plans about the implementation process. Client's requirements, deadlines, development model etc. are detailed to the both teams. There are many decisions to be made during this phase, like building components.

The architecture and requirement documents serve the purpose of project completion of guidelines. It also checks with issues of quality, performance, baselines, libraries, and debugging.

The gadget is essentially a home windows shape application walking on the domicile windows OS. It has two regions especially the administrator place which serves a platform for the manager position to use all functionalities of the system and a public screen that shows an incoming worker and the time and date. the backend consists of the database which stores as well as supplies data to and from the device. Both the back and frontend of the tool engage with each other on a real-time basis.

## SCREENSHOTS

The succeeding snapshot enumerates the overall doing out of the software. Then working mechanism states firstly the feasible human eye areas are detected by testing all the valley regions in the gray-level image. Then the genetic algorithm is used to generate every part of possible face parts which include eyebrows, the iris, the nose, and the mouth corners.

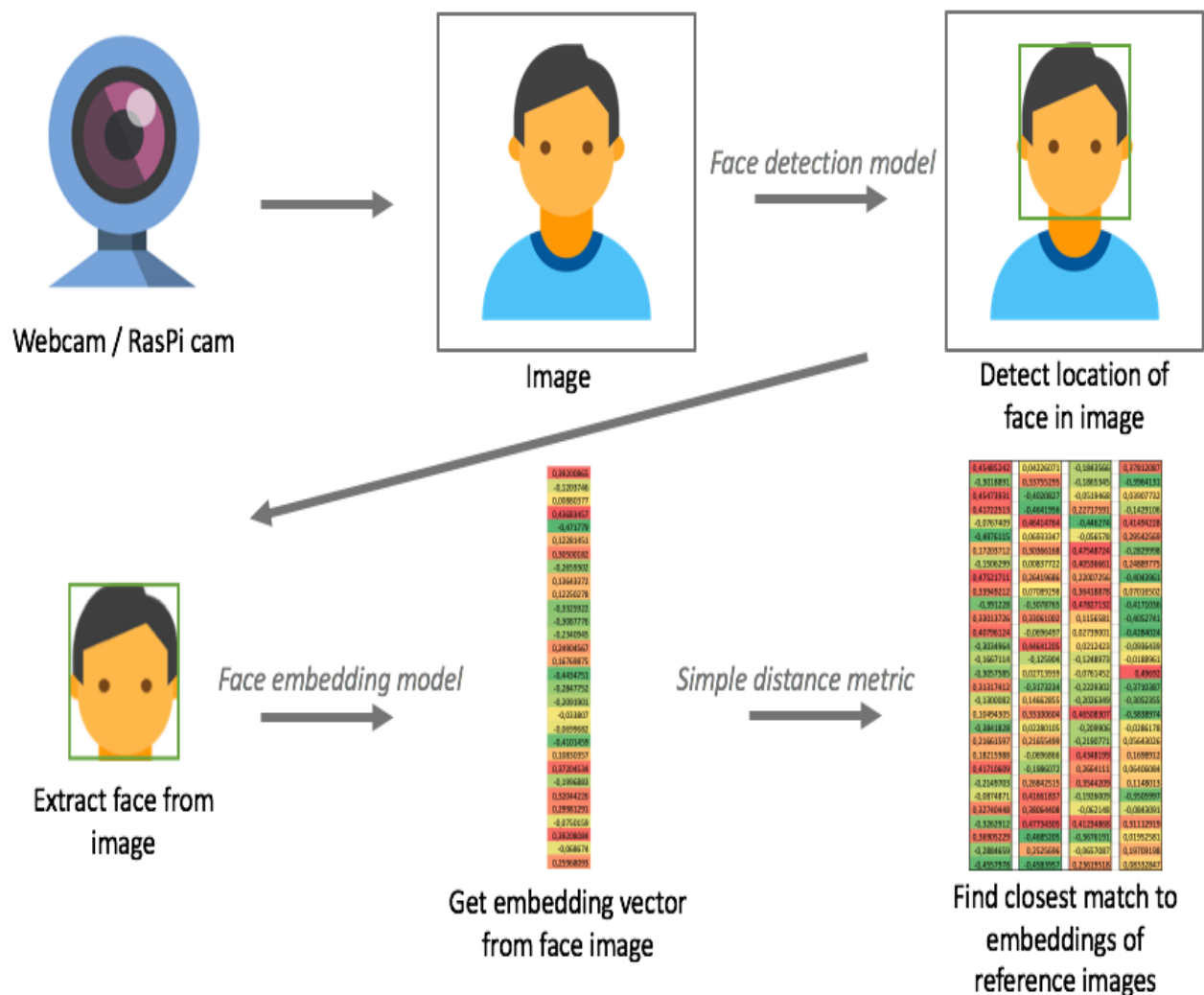
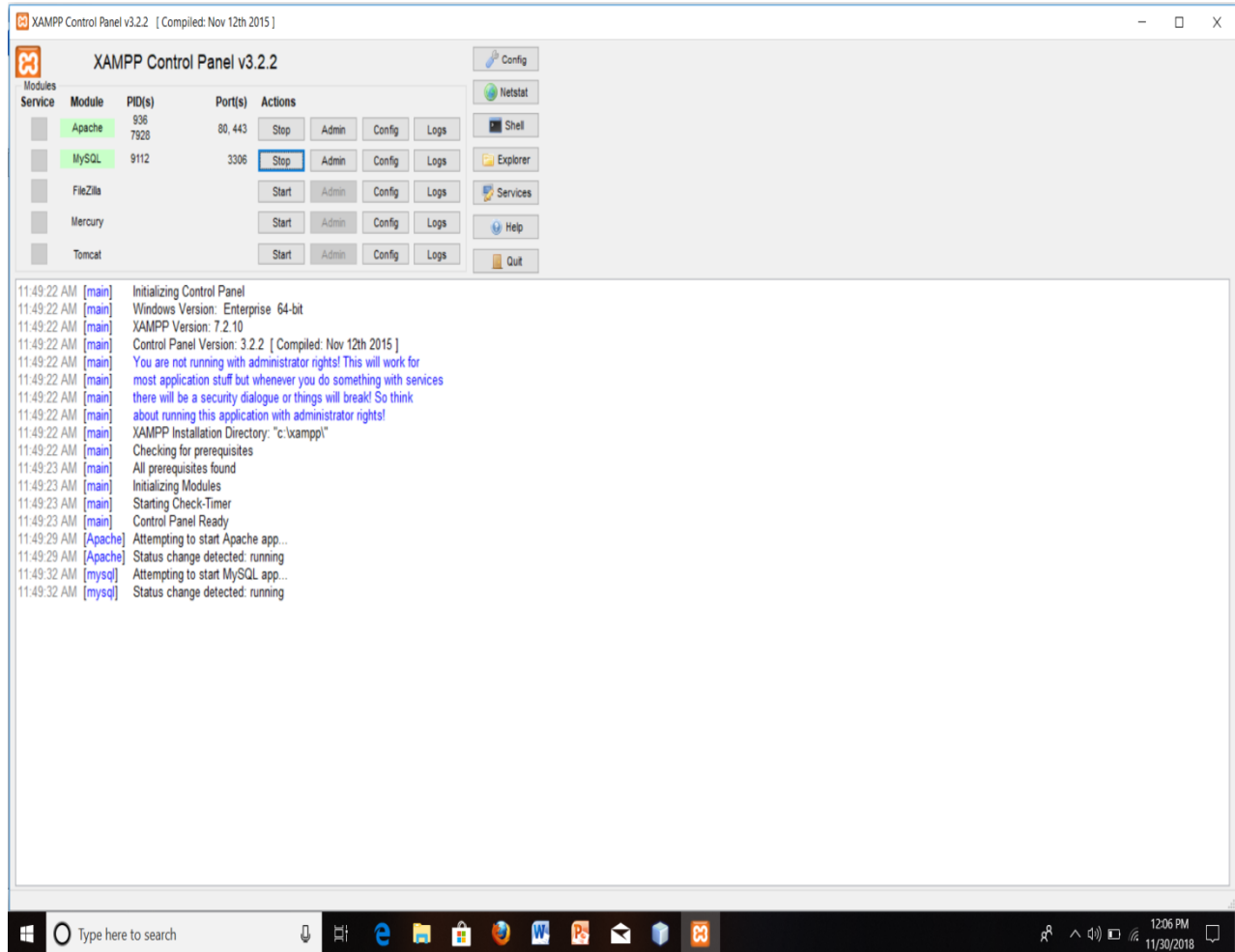


Figure 7: The Architecture representation of system

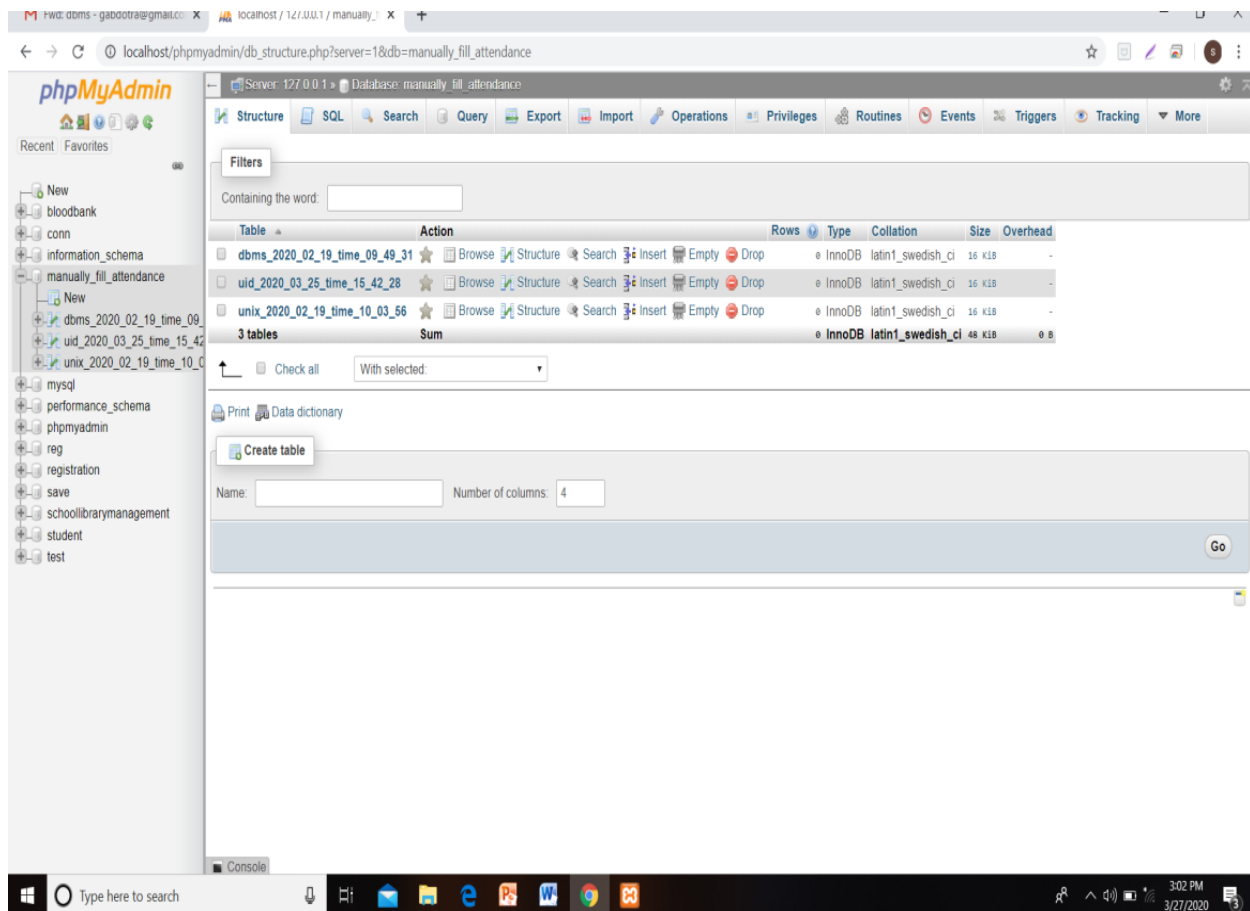


1. Unwrap the XAMPP Control Panel v3.2.2 and set up the apache and MYSQL sections and run the MySQL admin. Which gives the connection for user and database. Here we have to start both mysql and apache.



**Figure 8: The view of XAMPP control panel**

2. Create Database manually fill attendance to store tracked attendance data. The facts will be stored in table format with a unique id.
3. Open the IDLE (python 3 64 bit) where the software code written.
- 4.Run.



**Figure 9: Stored data in database**

5. The Time Tracker System Page appears. This is the main window user interface for the end-user. On launching the application, the login shape is displayed. This sheet grants get admission to the administrator to permit the use of a method. It includes an area holder for enrollment and name. A spark off additionally for incorrect Enrollment or name is in place.



**Figure 10: The Tracker System Login page**

6. Enter the Roll number of Student or unique id of Employee. Each worker and learner should have distinctive ID's with that number only they should log in to a system. If there were any spelling mistakes in entering a name the device will not accept.

The screenshot displays a web application interface for student registration. It features two input sections: 'Enter Enrollment' with the value '20' and 'Enter Name' with the value 'Rahul'. Each input field is accompanied by a 'Clear' button. Below these is a 'Check Register students' button. At the bottom, there are four buttons: 'Take Images', 'Train Images', 'Automatic Attendance', and 'Manually Fill Attendance'. The interface is set against a light pink background. The Windows taskbar at the bottom shows the search bar, taskbar icons, and system tray with the date 3/27/2020 and time 5:19 PM.

**Figure 11: Registering page**

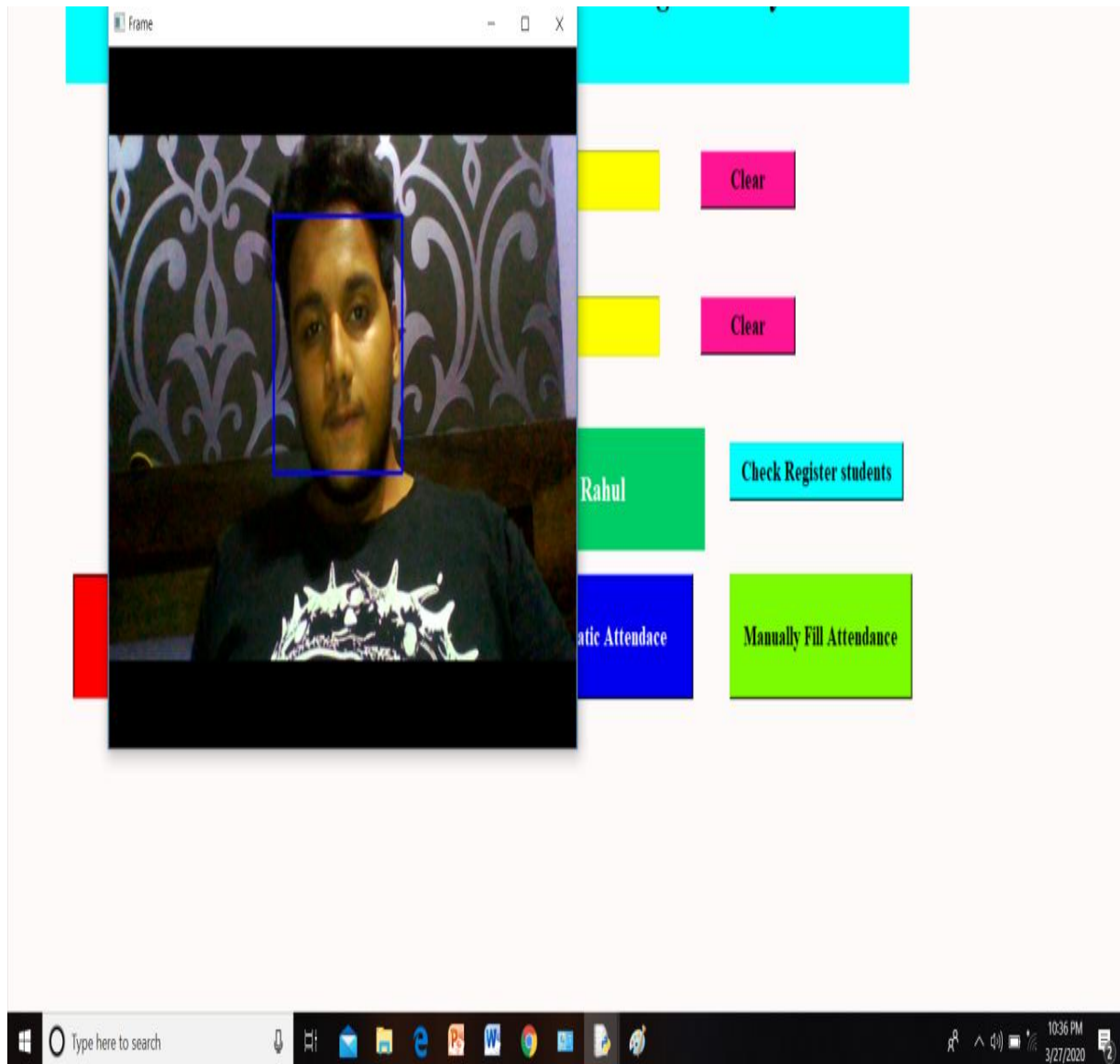
After entering the unique id and name then click on the take image button. It will stock pictures and the train picture button determination to educate a version for similarity recognition. If an acknowledgment is correct it willpower successfully saves the details in a record.

The image shows a web interface for student registration. It features two input sections: one for enrollment ID (143205) and one for name (abc). Below these is a green confirmation box stating 'Images Saved for Enrollment : 143205 Name : abc'. At the bottom, there are three buttons: 'Take Images' (blue), 'Train Images' (green), and 'Automatic Attendace' (blue). A 'Check Register students' button is also present on the right side.

Enter Enrollment	143205	Clear
Enter Name	abc	Clear
Images Saved for Enrollment : 143205 Name : abc		Check Register students
Take Images	Train Images	Automatic Attendace

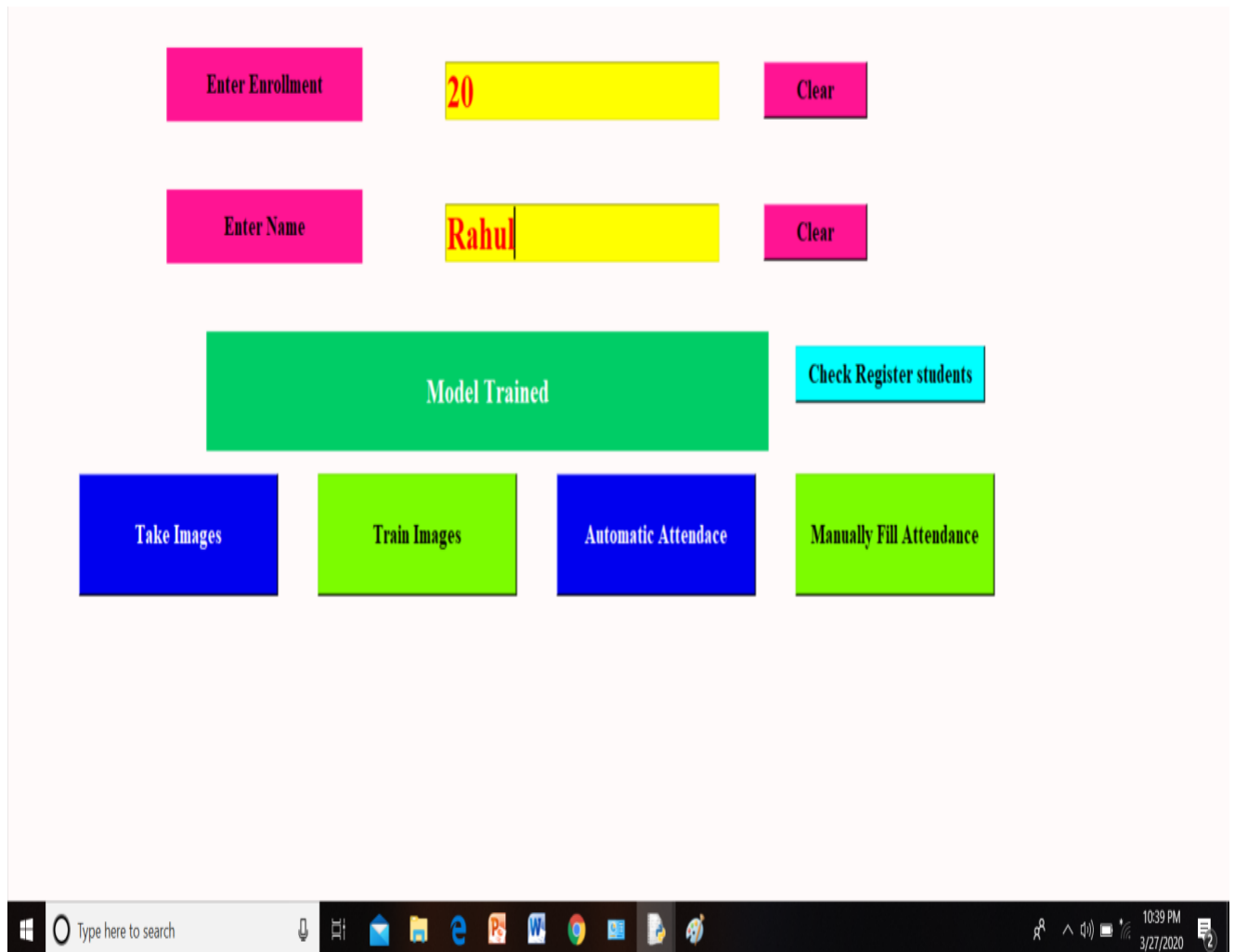
**Figure 12: Saved Registration form**

7. Choose the option to take the image. This module purpose clicks a picture of each student registered for a subject or a particular department. When the face has detected all details stored for that exacting countenance will be displayed.



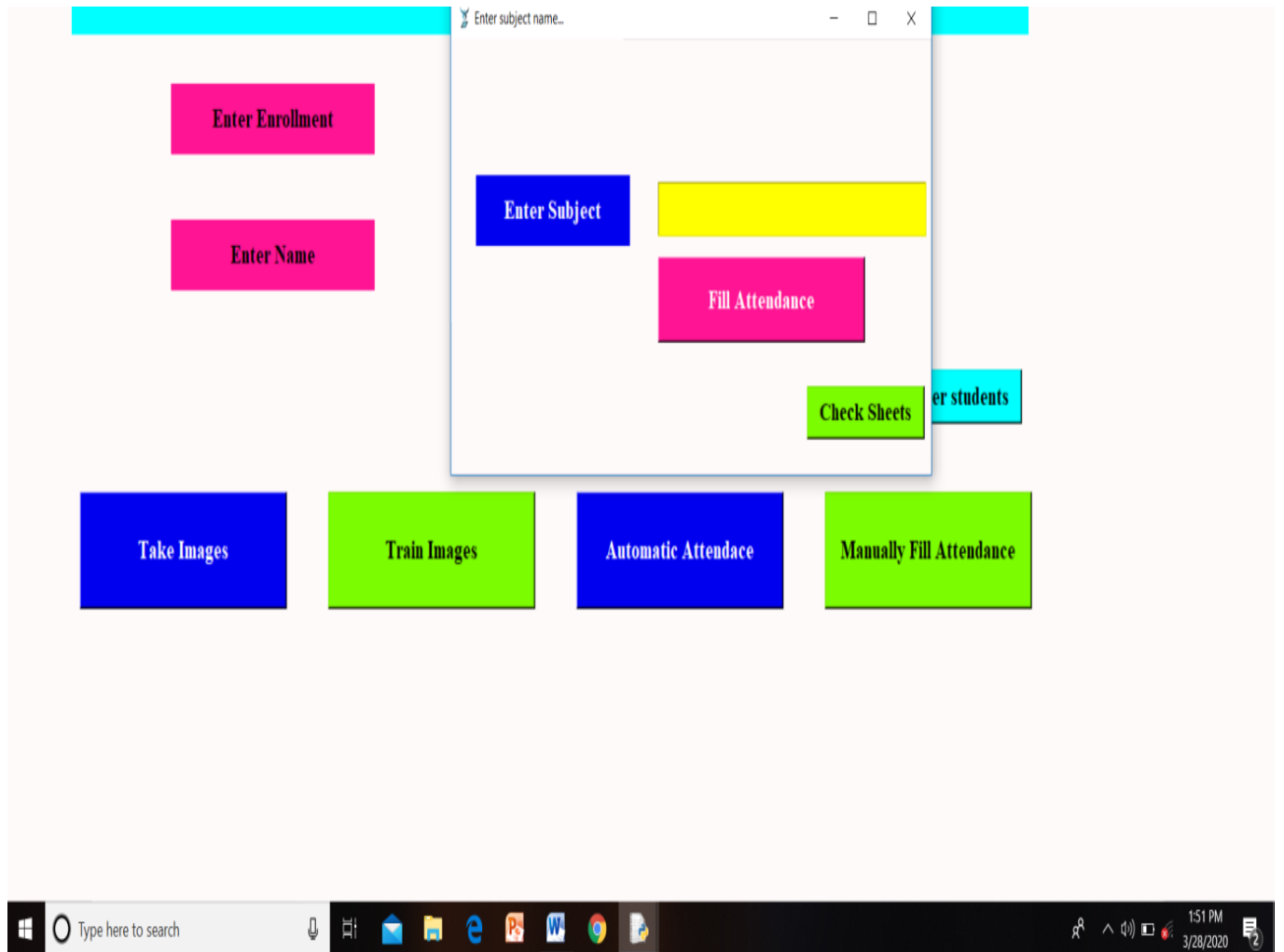
**Figure 13: Face detecting page**

8. Click on the option Train image. This module will save the image of each student or employee with their register number. Just it will verify in the catalog.



**Figure 14: Train Image page**

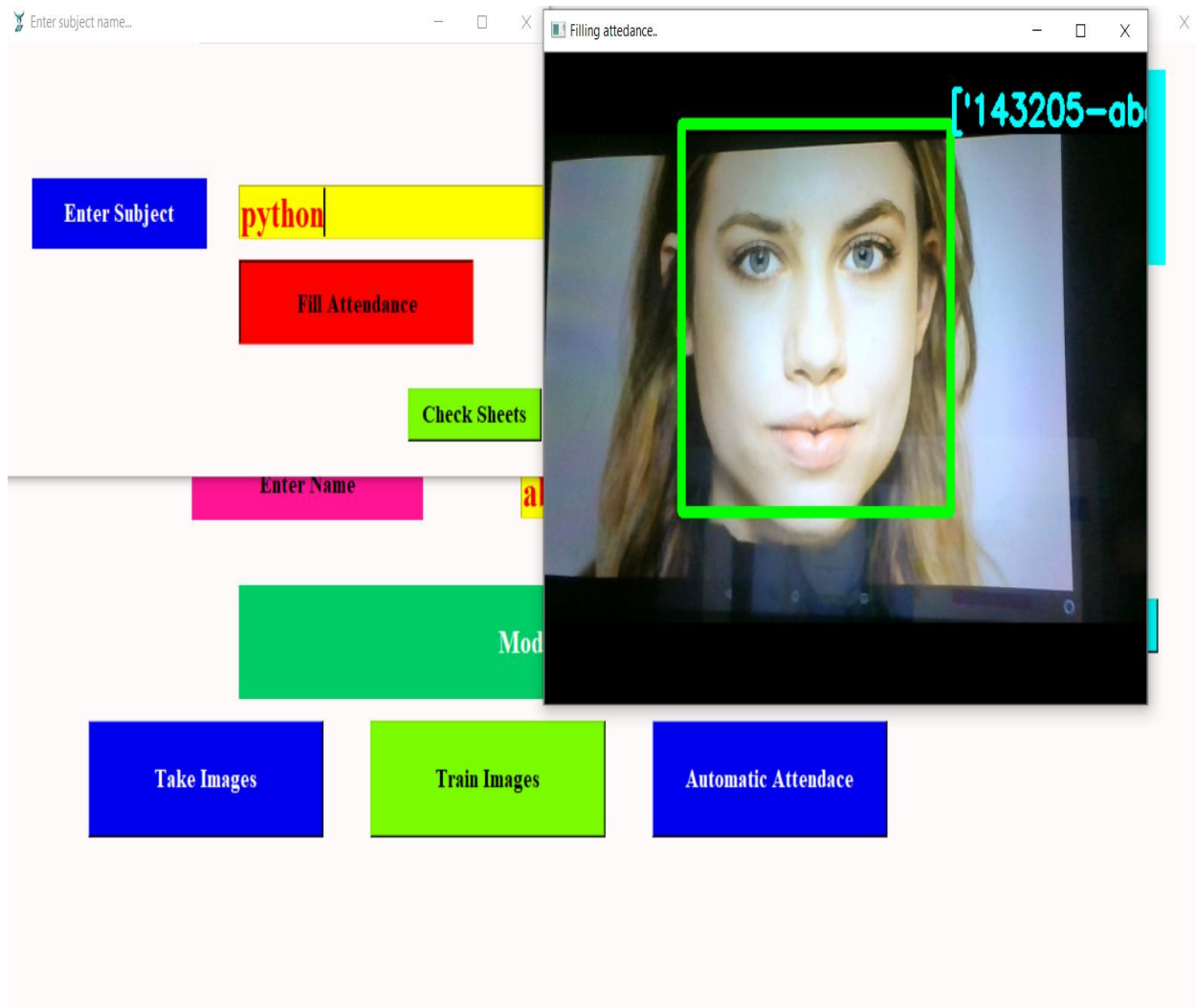
9. Automatic attendance this module will take a subject as input and will identify the student or an employee by face detection. By using this in order blot the presence in a particular table. The proprietor can generate a record happening turnout based totally on date and department with status of the personnel be it present, absent or late.



**Figure 15: Automatic Attendance page**



The device can enroll a new worker imparting details such as ID, NAME, Department, Subject, and an image for detection. And the date of enrollment is also captured in this form. This display is visible on a monitor near the diagram for people to see if they had been captured and the moment they came in. the shape shows the date, occasion, employee detected, and mark the number present.



**Figure 16: Enrollment Screen**

10. Manually fill attendance module will take a subject, roll number and undergraduates or a member of staff name, and does not store the image. This module will never detect the faces.



**Figure 17: Manual Attendance form**

11. Yourself can fill data is in the database. Whenever you don't want the face detection format then we are capable of entering the details in a file by using MYSQL.

The screenshot shows the phpMyAdmin interface for a database named 'manually\_fill\_attendance'. The 'Structure' tab is active, displaying a table structure with the following columns: Table, Action, Rows, Type, Collation, Size, and Overhead. The table structure is as follows:

Table	Action	Rows	Type	Collation	Size	Overhead
dbms_2020_02_19_time_09_49_31	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 K B	-
sms_2020_03_28_time_14_08_34	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 K B	-
uid_2020_03_25_time_15_42_28	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 K B	-
unix_2020_02_19_time_10_03_56	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 K B	-
4 tables	Sum	0	InnoDB	latin1_swedish_ci	64 K B	0 B

Below the table structure, there is a 'Create table' form with the following fields:

- Name:
- Number of columns:
- Go button

**Figure 18: Manually entered data page**

## **CHAPTER 7**

### **SOFTWARE TESTING**

It is characterized as a process of investigating a software and identifying the difference and among the actual and required conditions and also to validate the characteristics of the system or component. It can be described as an action of eliminating the program errors from an application. It was the foremost activity for the duration of the software progress. The curriculum is being performed by using several checks belonging to the amount produced by the syllabus is evaluated to verify if the appliances are functioning according to the user necessities or not. Software testing is the most important activity that exhibits the final analysis of design and code generation.

#### **Categories of Testing**

- **White Box**
- **Black Box**

#### ✓ **WHITE BOX Testing**

It is also entitled as Glass Box testing. It is the process of checking the domestic edifice or working of submission as it was expected on the way to perform.

#### ✓ **BLACK BOX Testing**

It is also named behavioral Testing, which examines the services of the scheme without interfering the internal structures of the system. This can be applied on diverse points of trying toward check the correctness of software it just verifies whether the requirements are satisfied without entering the internal structure of the software.

#### **1.1 Testing Stages**

The testing stages are:

- I. Unit Testing
- II. User acceptance Testing

## **1.2 UNIT TESTING**

Unit testing is a test which is carried on to test whether the individual programs are working correctly.

## **1.3 USER ACCEPTANCE TESTING**

User approval testing is the very last piece of a software development practice, for the period of UAT, factual groupware clients ordeal the system to compose it could deal with obligatory errands in genuine-global eventualities. UAT is considered single of the concluding and nearly all crucial product measures with the aim of arise in advance than newly advanced bundled software program is rolled out to the market. Is likewise baptize beta testing, appliance checking or end-user checking out.

## **1.4 TEST PLAN**

The experiment sketch utters the difficult scale, loom, property and agenda of intended activity. Among many of test items it identifies the features to be tested, and assigning which will do what task, how independent the tester is, the environment in which the test is going to be done, what are the design techniques that be used and access and outlet criterion to be worn, and the risks involving contingency planning. In general, it defines the test planning process.

## **1.5 Test Data**

Testing Data is the one which can used for testing the qualities/ Test data is used to perform testing.

## **1.6 Test Report**

Test Report is wanted to estimate the consequences in a formal way. It's miles a record that records information were given from an assessment strive in a composed manner, depicts the natural or running conditions, and examination of check comes approximately with take a look at targets.

## 1.7 TEST CASES

The subsequent table characterizes the log in an index. The apprentice when stands in-front of a camera it will identify the expression and transforms the slide to next. If the face is new it will never detect features.

**Table 1: Login table**

Test ID	Test Case	Purpose	Output	Result
1	Login By showing face to webcam	Recognizes face in database with id	Login successfully	Pass
2	While login fails webcam unable to detect the face	Person face is not registered in the database with id	Invalid	Pass

**REGISTER:** The user wants to register for the first time then he/ she should do registration with exclusive Id and show his face to webcam and it will recognize the edges store it in the list.

**Table 2: Register table**

Test ID	Test Case	Purpose	Output	Result
1	Registering for first	Enter his/her unique id, name and click on register now button	Successfully registered	pass
2	Incomplete listing	If ID was same or face is not detected	Registration failed	pass

The Next chart explains the handing out of the device. The course of extracting the features, identification, transformation, checking details, these kinds of information will be illustrated by this table. Which gives the whole flow work of the machine.

**Table 3: Processing table**

Test Id	Test Case	Purpose	Output	Result
1	Take image	After log in click take picture button to load likeness within the directory	Image loaded effectively	Pass
2	Train image	Detects the edges to match the pixels of copy	Model Trained Successfully	Pass
3	Manually enter details	Student can enter the subject name or departments for presence	Details added successfully	Pass
4	View Attendance	Users can see their tracked attendance	Presents attendance list	pass

The upcoming sheet corresponds to the logout table. After entering the details and attendance one leaves the system. The machine will store in and out time in the folder.

**Table 4: Logout Table**

Test Id	Test Case	Purpose	Output	Result
1	After login display in time	When system detects the faces time should be recorded in the documentation	In-time was marked	Pass
2	Logout	While going out from company/ organization	Out- time was marked	pass



## CHAPTER 8

### CONCLUSION

Internships be deliberate to swell the intensity of scholastic culture for us in our vicinity of revise. It is the prospect for us to obtain understanding in applying the supposition erudite inside the lecture room to precise familiarity within the community and toil planet. An internship in addition canister heighten our alertness of network issues, induce us to craft openings, hold new-fangled thoughts, and make available direction to optimistic alteration.

Time tracker system uses image processing for face detection which was a new concept for us. Python's face recognition library turns out to be fast and very reliable tool for visage discovery and features appreciation. As Python is a high level programming language the libraries well suited to be used just as a face detection (recognition) procedure in a wider project without the need for a detailed knowledge of the theoretical background of the employed algorithms.

An Picture-based totally trailing coordination tin can locate the accurate location of the poignant individual look. Tracking truthfulness, doling out time and applicability to surgical atmosphere is the newness of this process. Consequently, this make inquiries enables the presentation of the pursue machine want to be cut down with no separate trail device.

## CHAPTER 9

### FUTURE ENHANCEMENT

Because for the potential work, a loads extra trying out and debugging is looked-for this system was urbanized in a awfully confined time and assets. However, due to the fact that it's an release source software, developer can affix original task and progress the default characteristic. In addition, the device be capable of facet a picture processing where the input likeness are regularly made much less blurry as a result the structure container come across face on lower eminence images. Other than that, the gadget be able to use a list which comprise the private news of the self in the catalog.

The challenge is only a blueprint for implementing an absolute purposeful tracker classification. After this proposal, systematic studies need to be done on this tool, laying extra prominence on the effect it has on the crowd and how it has advanced the company's worker-hour-output. The influence that this device has on the commercial enterprise sector should be studied and compared to that of the manual machine.

- Face gratitude method
- Using Fingerprints

## CHAPTER 10

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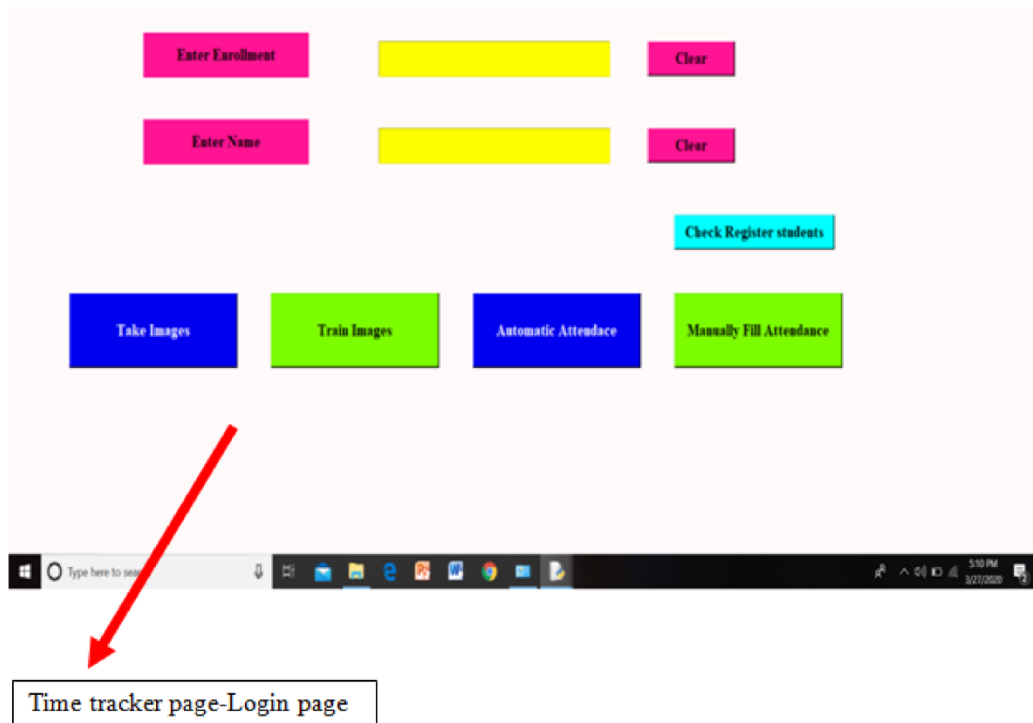
[www.intechopen.com](http://www.intechopen.com)

[www.w3school.org](http://www.w3school.org)

## CHAPTER 11

### USER MANUAL

This is the foremost windowpane consumer frame for the end-patron. Which consists of the buttons by that users know how to do the special operations. A client can schedule, load photograph, physically fill the presence, and view the number present. this mass grants obtain admittance into the system on the way to authorize using a method. It comprises an area proprietor for enrollment and call.



**Figure 19: Log in Page**

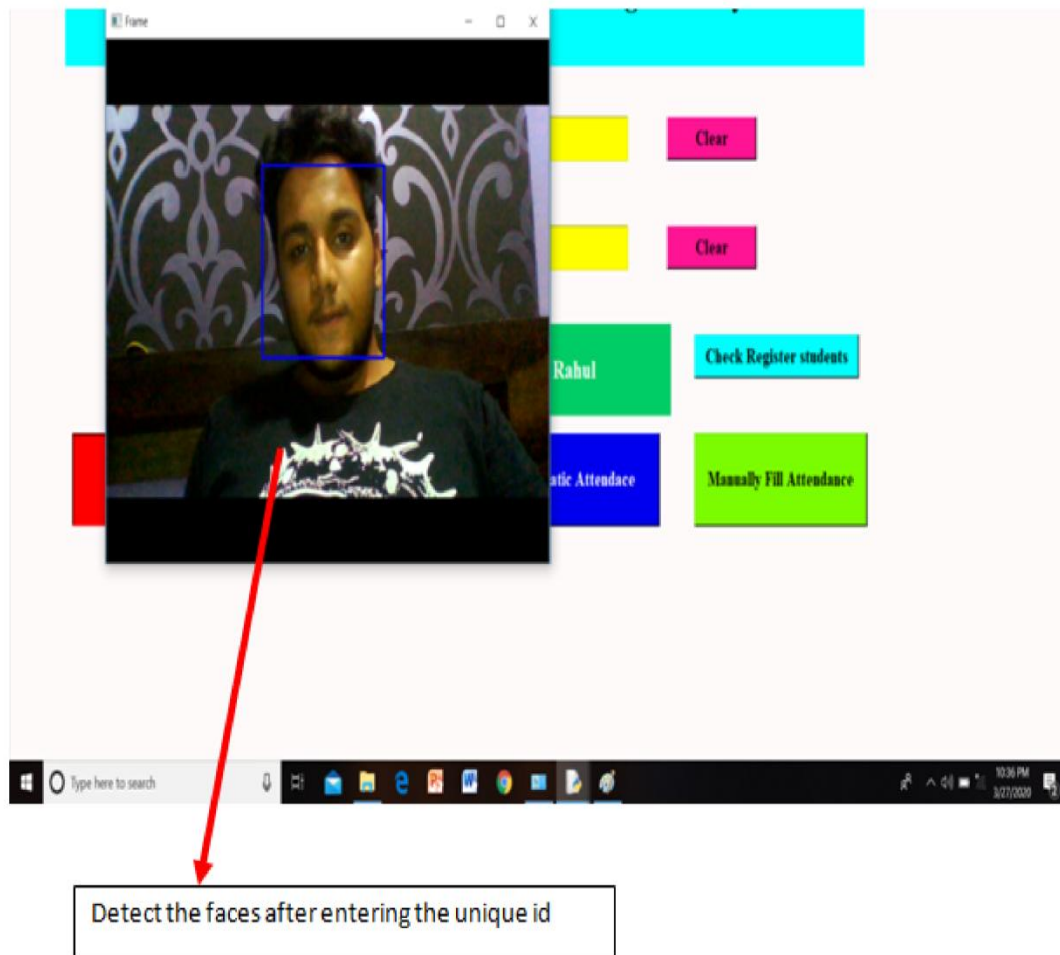
If you are a new user then first you have to register. Enter the turning quantity and exacting identity of Employee. Each member of staff and learner need to encompass extraordinary ID with that wide variety most effective they should log into a structure. Later than getting into a defined discovery and name. Then click on the button it will stock snapshots within a record. If an acceptance is accurate it determinates correctly saves the details in a file.



The image shows a software interface for registration. At the top, there are two input fields: "Enter Enrollment" with the value "20" and "Enter Name" with the value "Rahul". Each input field has a "Clear" button to its right. Below these are several action buttons: "Take Images" (blue), "Train Images" (green), "Automatic Attendance" (blue), "Manually Fill Attendance" (green), and "Check Register students" (cyan). A red arrow points from the "Rahul" text in the "Enter Name" field down to a white text box with a black border containing the text "Enter the id and name for registration". The interface is displayed on a Windows desktop with a taskbar at the bottom showing the search bar and various application icons.

**Figure 20: Registration form**

The succeeding picture symbolizes face detection mechanism. It shows how the software recognize the images. this recognition will be based on the corner edges. In multi-dimension device checks the faces for this so many algorithms are used. When the feature was identified the machine will loads information on the subsequent table.



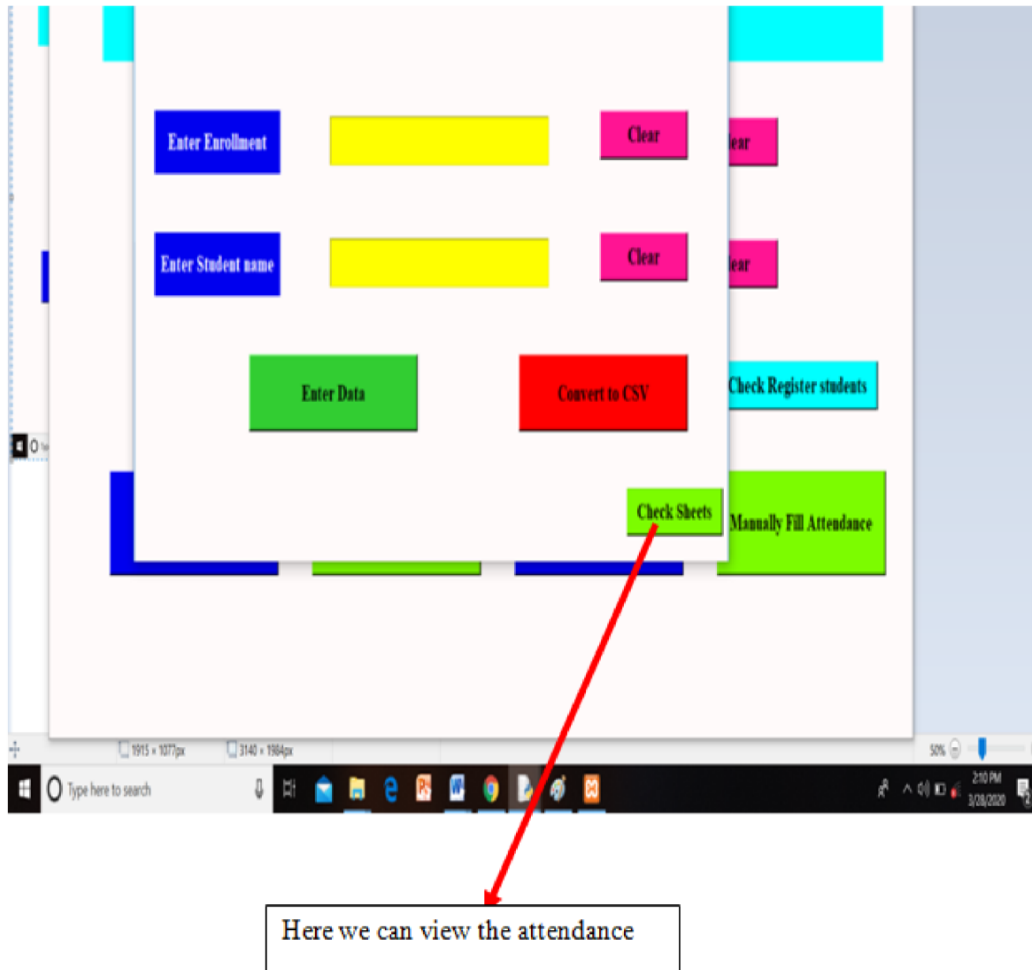
**Figure 21:Face Detection page**

Here we can add the presence manually for an individual subject or department. When you are entering the facts by yourself don't focus on facade exposure. Because your data was already stored in the database. It will automatically store the time in hours in the catalog.



**Figure 22: Fill Attendance form**

When persons want to see their attendance they use this check sheet button. Upon clicking the system will loads the detailed information from the saved folder along with date and time and display it to the end-user.




**Figure 23:Attendance View Form**



This table represents how the records were stored within the CSV file in detail. Stores the info as row and column manner. It gives depth description of a person in table format.

10473500	XYZ	#####	16.41.36								
143205	abc	#####	16.52.33								
143205	abcd	#####	17.02.37								



Csv file to store the details .It stores roll number , name and time

**Figure 24: Stored details form**