

CNN based Human Detection to Save Electricity

UCS503 Software Engineering Project Report

End-Semester Evaluation

Submitted by:

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CSBS1 Group No:2

Submitted to:

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**THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)**

Computer Science and Engineering Department

TIET, Patiala

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1. Project Selection Phase

1.1. Software Bid

Software Bid/ Project Teams

UCT 305- Software Engineering Lab

Group: 2BS1/2BS3

Dated:09Aug 2022

Team Name: Incognito

Team ID (will be assigned by Instructor): (BS1)2

Please enter the names of your Preferred Team Members:

Name	Roll No	Project Experience	Programming Language used
Chandravo Bhattacharya	102118016	Built the back end of the portal for CCS event (escalade)	Python
Lovedeep Singh	102118014	NULL	Html, CSS, Javascript
Tijil Malhotra	102118007	Built the front end of the portal for CCS event (escalade).	Html, CSS, Javascript
Vaniya Tripathi	102118070	Built the front end of the portal for CCS event (escalade).	Html, CSS, Javascript

Programming Language / Environment Experience

List the languages you are most comfortable developing in, **as a team**, in your order of preference. Many of the projects involve Java or C/C++ programming.

1. HTML, CSS
2. Javascript
3. Python

Choices of Projects:

Please select **4 projects** your team would like to work on, by order of preference:

S.NO.	PROJECT NAME	USP
First Choice	CNN based Human Detection to Save Electricity	This project would save a lot of electricity and money by minimizing the work done by the security to check for empty rooms with lights on; this project can be implemented in almost every workspace ex. hospitals, hotels, universities, offices etc. This can also be automated.
Second Choice	Class Attendance using Facial Detection or Biometrics	Would reduce time wastage during manual attendance and ensure that no one else can mark your attendance in your absence.
Third Choice	Sign Language to Text	This would benefit society since it is a social cause and will not only help deaf and mute people to communicate better but would also allow other individuals to understand better.
Fourth Choice	Gestures Recognition for Human-Computer Interaction	This would help professionals and students to speed up their work by eliminating the need for various computer operations that can be signaled to a webcam instead of being clicked on manually.

Additional Remarks/ Inputs

Please tell us about any other factors that we should take into consideration (e.g., if you really would like to work on a project for some particularly convincing reason).

First choice- CNN based Human Detection to Save Electricity.

Reason: We believe that we can save a lot of electricity by the successful implementation of our project; we would detect human presence in classrooms on the campus, and if the classroom is empty, then our model would send a notification to the administrator to switch off the lights, this would reduce efforts put in by guards to check the classrooms continuously.

1.2. Project Overview

The goal is to design a software intending to conserve electricity based on human detection. This system will use a simple CCTV camera to detect human presence in classrooms. In case the classroom is detected empty and the lights are on, the system will notify the administrator regarding the same via a live web notification.

Furthermore, the system will allow the administrator to have access to the status of all classrooms in the campus through a website. This system will make administration easier and prevent unnecessary electricity wastage.

The system's application is not restricted to the university campus alone because other campuses can make use of the same mechanism. This technique can be used in the commercial and service sectors as well.

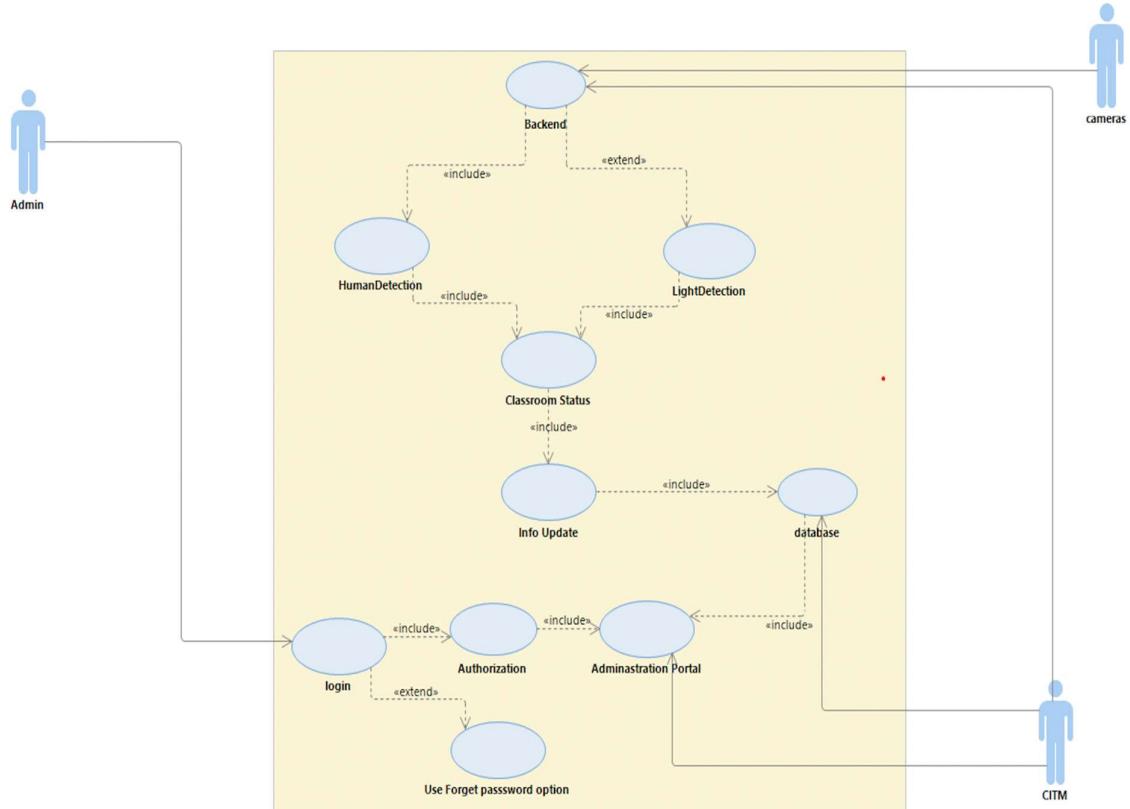
This product is a new, self-contained product. It comes as a solution to a major issue faced by the institutions: wastage of electricity and excessive use of human labour. A lot of manual labour is required with wastage of time and resources, to continuously check for empty classrooms and to switch off the lights. With this product, the admin can view a list of classrooms, where the classroom having its light turned on and no human presence would be highlighted. Hence, instead of checking each and every classroom for the same, the required personnel could go to the highlighted classrooms and switch off the lights. This also reduces the chances of electricity wastage due to negligence or improper checking.

2. Analysis Phase

2.1. USE CASE

2.1.1. USE CASE DIAGRAM

The used case diagram is as follows:

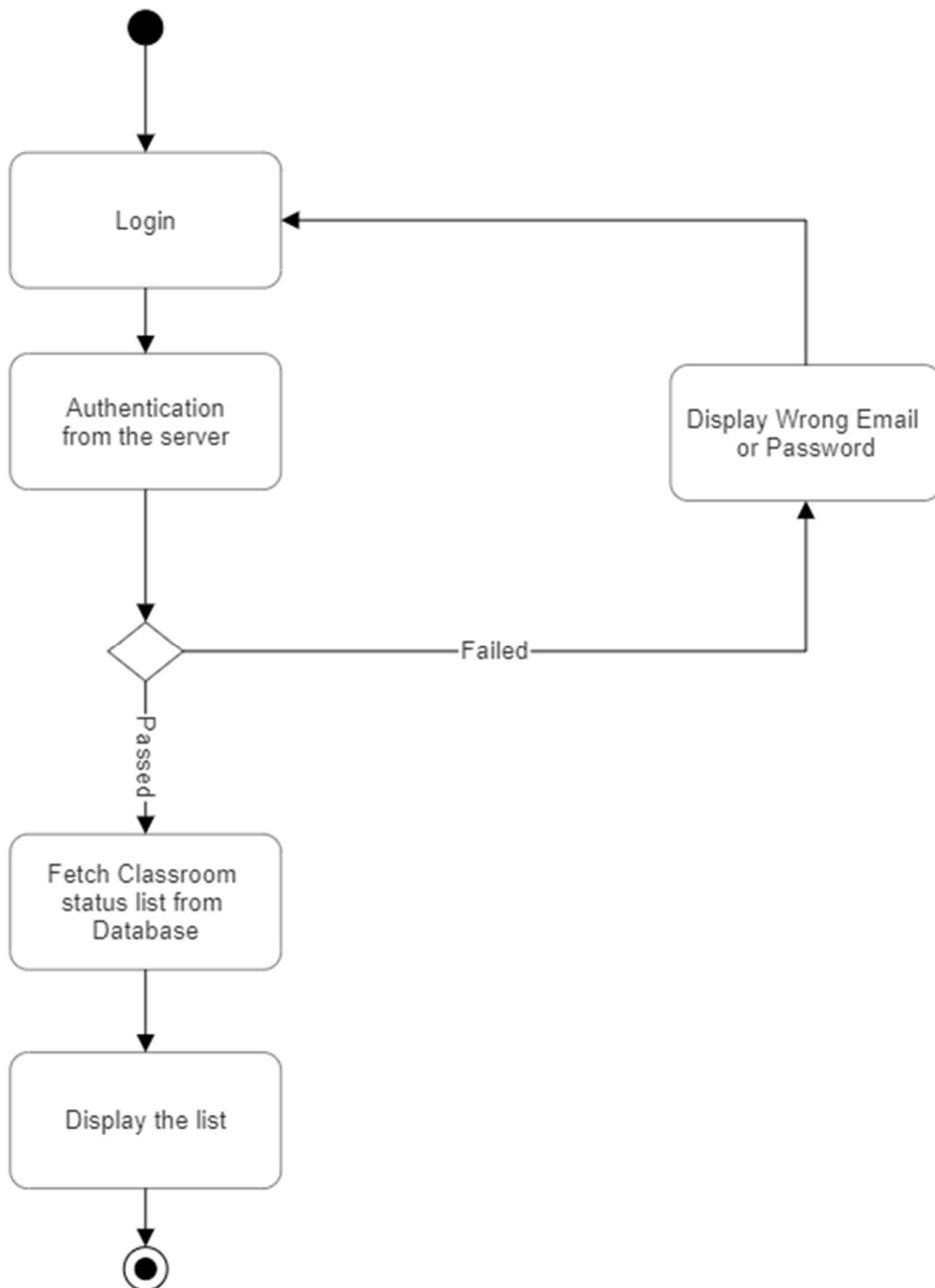


2.1.2 USE CASE TEMPLATES

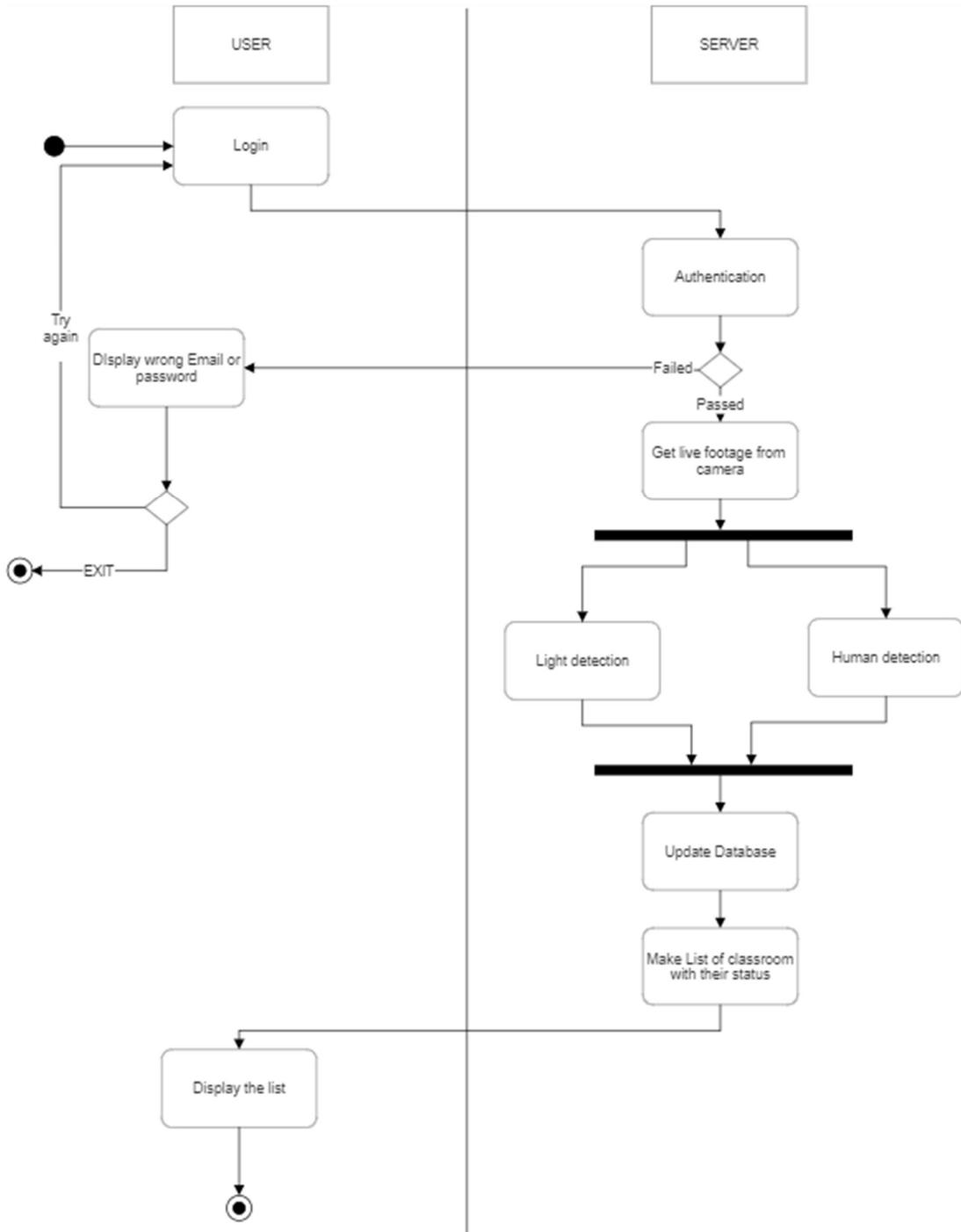
1. Use case Title	Check Classroom status
2. Abbreviated Title	Check Classroom status
3. Use case id	1
4. Actors	Admin
5. Description	With the check classroom status facility, user can check status of any given classroom whether it is Empty or not or if the lights in the room are left ON/OFF.
5. Precondition: The user must be a registered.	
5.1. Task sequence	<ol style="list-style-type: none"> 1.Login page will be shown. 2.Enter the User name and Password. 3. The welcome page will greet the User with the Clicking LOGIN button. 4.On clicking the check status page it system will show the list oof classroom and their status
5.2. Post Conditions:	1.User can view his desired result
6. Modifictaion History:	Date 9 -10-2022
7. Author:	Lovedeep Singh

2.2 Activity diagram and Swimlane Diagrams

The Activity diagram is as follows:

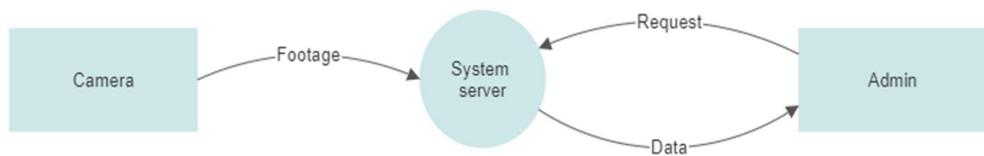


The Swimlane diagram is as follows

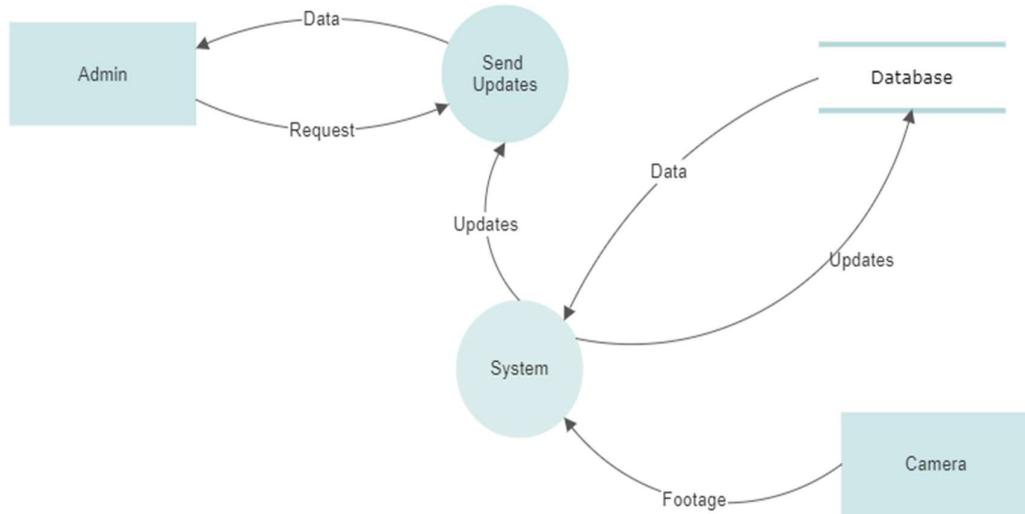


2.3 Data Flow Diagrams (DFDs)

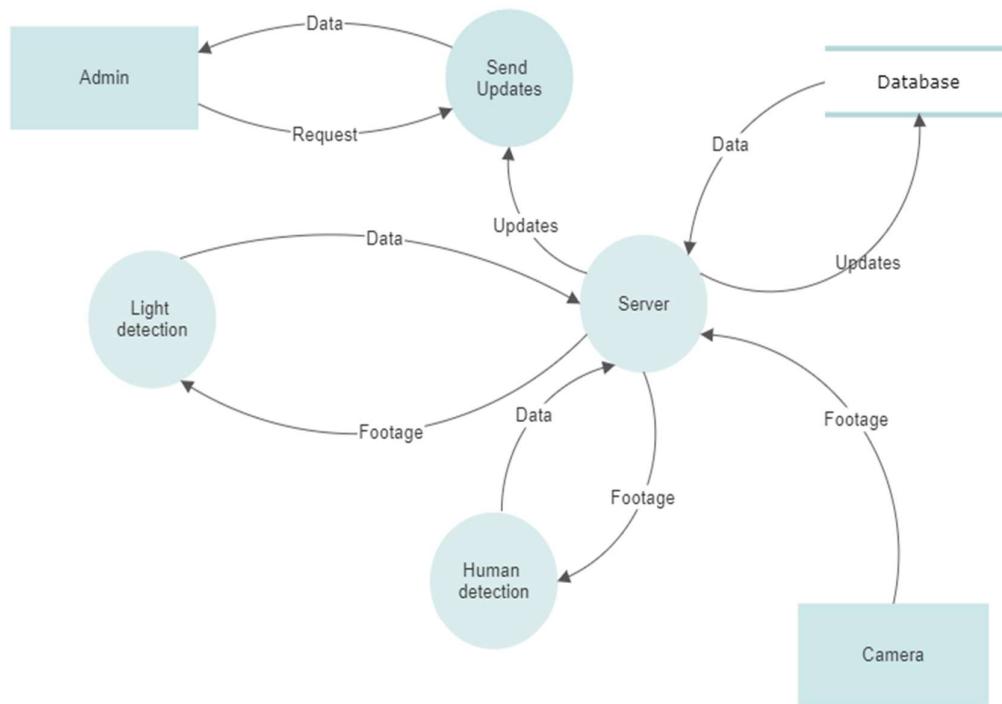
2.3.1 DFD Level 0



2.3.2 DFD Level 1



2.3.2 DFD Level 2



2.3.3 Data Dictionary

Name of data stored	Description/Purpose	Data structure or Data type	Alias	Field Size
Email	The email with which the admin logs into the portal.	Email	username	40
Password	The password with which the admin logs in to the portal.	password	password	20
Room number	The serial number of the room associated with the camera	String	room_no	10
Human Presence	Check if human is present	Boolean	human_presence	1
Light Presence	Check if light is on	Boolean	Light_presence	1
Classroom Status	Check if class is empty and light is on	Boolean	highlight	1

2.4 Software Requirement Specification in IEEE Format

**Software Requirements Specification
for**

**CNN based Human
Detection to Save Electricity**

Version 1.0 approved

Prepared by

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TEAM INCOGNITO

31/10/2022

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1. Purpose of this document

This SRS document's main goal is to give a thorough overview of our software product, including all of its features and objectives. This document outlines the project's user interface, hardware, and software requirements as well as its intended audience. It describes the way that our client, team, and audience view the product and its capabilities.

1.2. Product Scope

The goal is to design a software intending to conserve electricity based on human detection, including Access Control. This system will use a simple CCTV camera to detect human presence in classrooms. In case the classroom is detected empty and the lights are on, the system will notify the administrator regarding the same via a live web notification using web sockets. Furthermore, this system will allow the administrator to have access to the status of all classrooms in the campus through a website. [data storage and backend info] This system will make administration easier and prevent unnecessary electricity wastage.

The software must perform the following operations:

1. Human detection in classrooms
2. Light detection if the classroom is empty
3. Send live status notification – On detecting light and human presence, the software must be able to notify the administrator regarding the status of different classrooms. If an empty classroom is detected with lights on, it is highlighted at the admin panel.

Initially we plan to implement these functionalities for LP-110 with an intended audience of 72 people (of which 1 is staff member(teacher in charge) and remaining are students) as part of the Pilot Phase. Once the Pilot Phase is successful then we plan to implement it in other classrooms across the institute and eventually we plan to extend the Multi-Utility System of human detection, including Access Control to a wide variety of applications including library system, semester fee payment system, etc.

The system's application is not restricted to the university campus alone because other campuses can make use of the same mechanism. This technique can be used in the commercial and service sectors as well.

1.3. References

YOLOv3 Documentation - <https://pjreddie.com/darknet/yolo/>

2. Overall Description

2.1. Product Perspective

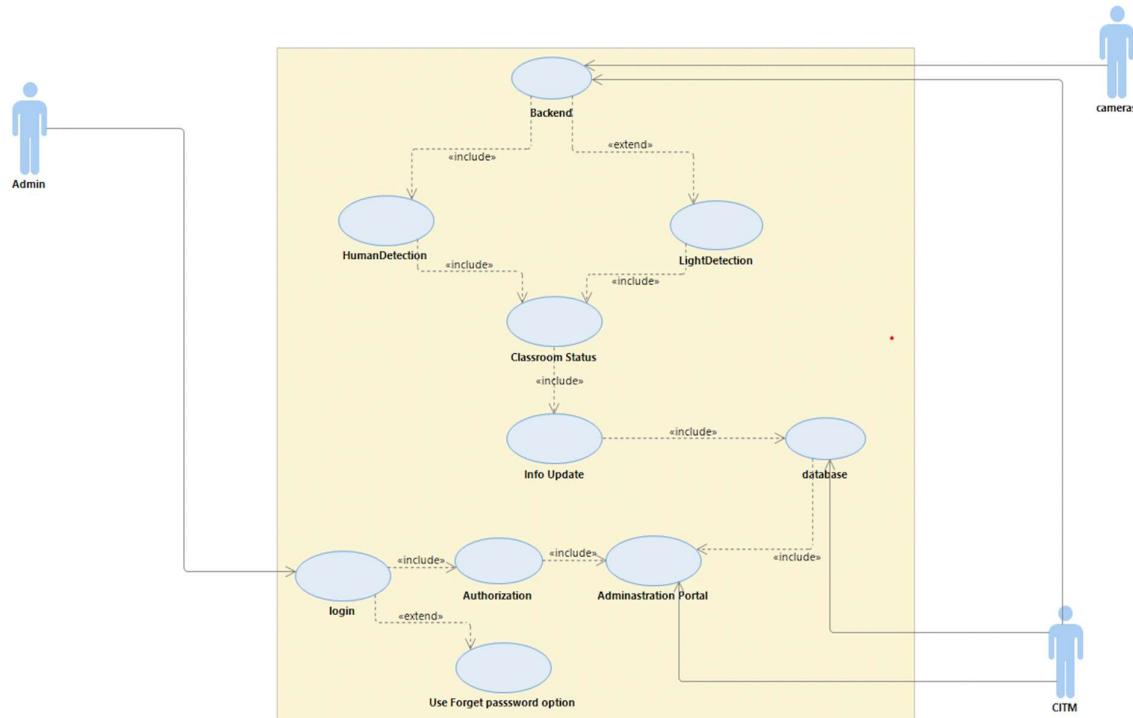
This product is a new, self-contained product. It comes as a solution to a major issue faced by the institutions: wastage of electricity and excessive use of human labour. A lot of manual labour is required with wastage of time and resources, to continuously check for empty classrooms and to switch off the lights. With this product, the admin can view a list of classrooms, where the classroom having its light turned on and no human presence would be highlighted. Hence, instead of checking each and every classroom for the same, the required personnel could go to the highlighted classrooms and switch off the lights. This also reduces the chances of electricity wastage due to negligence or improper checking.

2.2. Product Functions

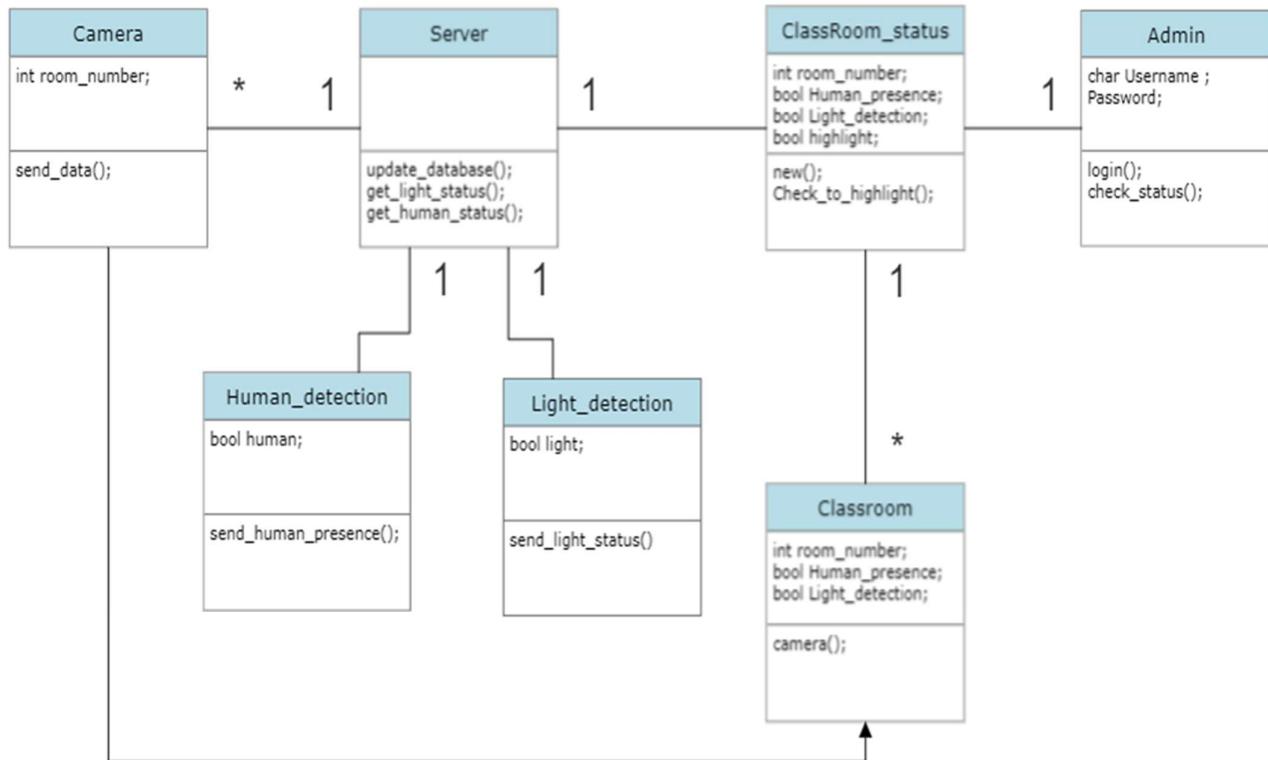
The product should be able to perform the following operations:

- The server should be able to access the data feed from classroom cameras.
- The server should be able to detect human presence in classrooms.
- The server should be able to detect light presence in classrooms.
- The sever should be able to update the classroom status in database.
- The server should be able to check the status and highlight the required classrooms in user interface accordingly.
- The software product should be accessible to admin after successful log-in.
- The admin should be able to view the classroom status and check the highlighted classrooms.

The used case diagram is as follows:



The class diagram is as follows:



2.3. User Classes and Characteristics

The product will be used by the following user types with varying frequencies for the same:

1. Admin
2. Database Engineer (CITM)

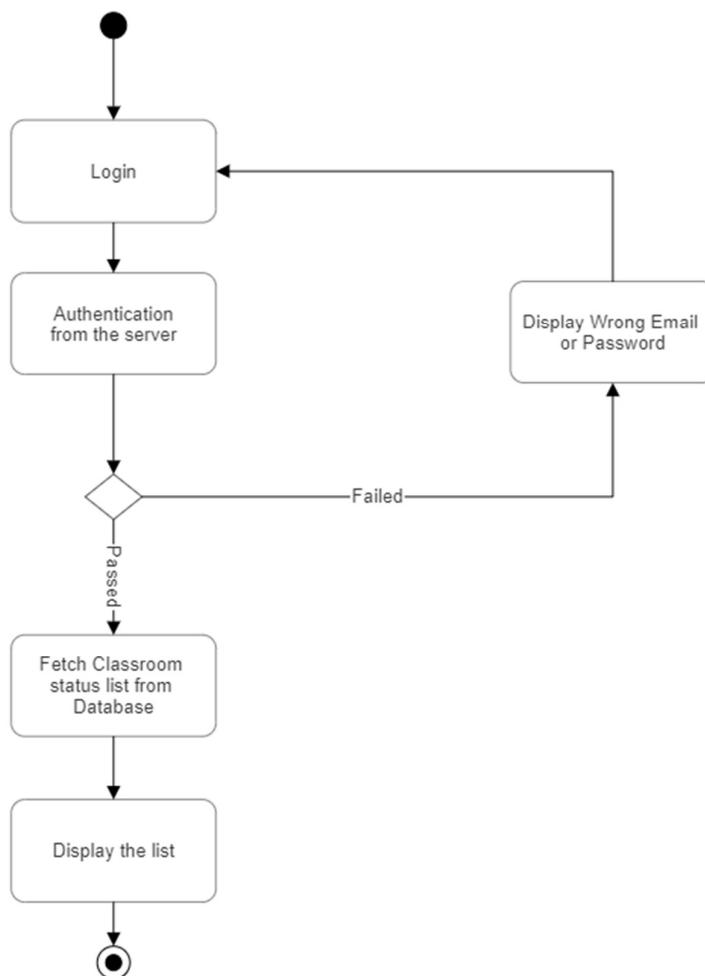
The order of users is given in the decreasing order of frequency of the same. The User Interface and features for each type of user will be different depending on the allowance and permissions to access data. The most important user class is the Admin.

1. The Admin monitors the classroom status using this software product. It can view the list of classrooms in user interface. It can check the highlighted classrooms, i.e., the classrooms which have no human presence but are having the lights in use leading to electricity wastage.
2. The database engineer can access the servers and can control the backend.

As one can see from the list, each user will have different educational background and expertise level in using the system. Our goal is to develop software that should be easy to use for all types of users

Thus, while designing the software one can assume that each user type has the following characteristics:

The user is computer-literate and has little or no difficulty in using the software product to access information such as room status.



2.4.Operating Environment

The software can be deployed and operated on a server with a connected camera. The server should have a CPU and GPU which meet the requirements of YOLOv3 system requirements.

2.5.Design and Implementation Constraints

The design and implementation constraints for the developers are the following:-

- The developer should have an appropriate system to handle the computing of YOLOv3
- The developers must have sufficient knowledge of python , CSS, HTML and JavaScript.

2.6.User Documentation

Our Project uses YOLOv3 architecture. The Documentation of YOLOv3 is Available on

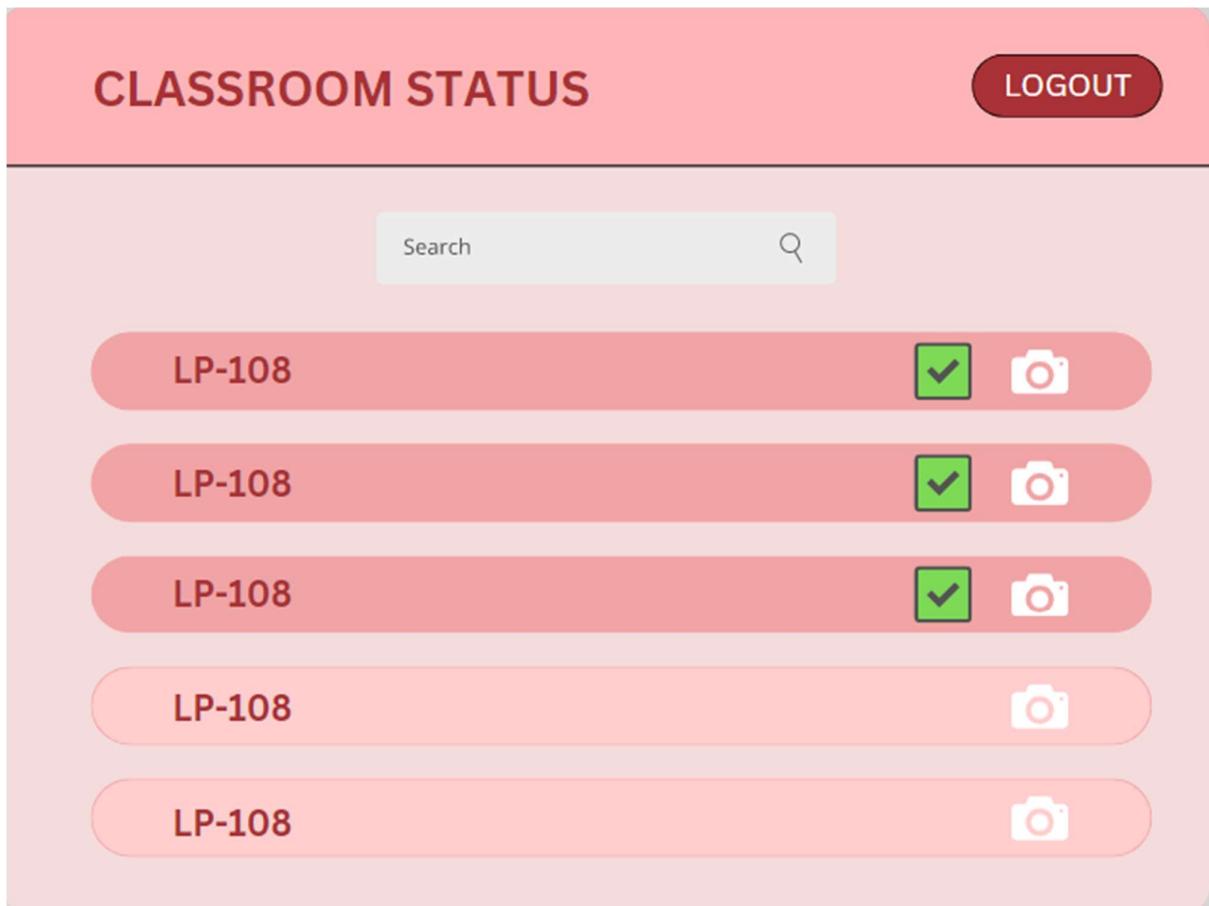
2.7.Assumptions and Dependencies

The following list presents the constraints, assumptions, dependencies or guidelines that are imposed upon implementation of the system:

- Response time for loading the software and for processing a transaction should be no longer than five seconds.
- System should meet the YOLOv3 hardware requirements.
- There must be a camera having an uninterrupted access to the room whose status has to be checked.
- A general knowledge of basic computer skills and basic working of web browsers are needed to avail the benefits of this system;
- A good network connection is required for the proper working of the system.
- Web-site must be refreshed on regular intervals of three hours

3.External Interface Requirements

3.1.User Interfaces



3.2.Hardware Interfaces

The following list represents the hardware interface requirements:

- Camera : The camera must be of 12 MP or higher and the camera must be connected to the server at all times. The camera will be providing live feed to the server using TCP/UDP/HTTP protocols.
- Server : The server must contain appropriate CPU and GPU to support YOLOv3 and it must contain a network adapter compatible to be linked with the cameras. The server should feed the data received from the camera to the program.
- To access the website, the user will need a computer screen of appropriate size.

3.3.Software Interfaces

The following list represents the software interfaces:

- This software uses the YOLOv3 algorithm for human detection. YOLOv3 (You Only Look Once, Version 3) is a real-time object detection algorithm that identifies specific

- objects in videos, live feeds, or images. The YOLO machine learning algorithm uses features learned by a deep convolutional neural network to detect an object. The model comes pre-trained; the model does not need to be trained manually.
- The software uses OpenCV (Open Source Computer Vision Library) for computer vision and image processing. OpenCV (Open Source Computer Vision Library) is an open-source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in commercial products.

3.4. Communications Interfaces

The following list represents the communication interfaces:

- The camera and server will communicate using the protocols TCP(Transmission Control Protocol), UDP(User Datagram Protocol) and FTP(File Transfer Protocol).
- The web-client and server communicate through HTTP(Hyper-Text Transfer Protocol).

4. Software Features

The software intends to conserve electricity based on human detection, so to fulfill our Goal, the software must contain the Following System Features:-

- Human detection
- Light Detection
- check lab/classroom status
- Access log
- Send Live Notification

4.1. Human detection:-

The software should be able to detect the presence of a human in a Classroom/lab to check whether a classroom is empty and Change the status in the Database.

Priority:-

- It is a High priority feature. It must be present for the system to run.

Stimulus:-

- No stimulus needed

Response Sequences:-

- The software will check for human presence using Live Feed from the CCTV Camera installed in Classroom/Lab.
- Update the Database

4.2. Light Detection:-

The software should be able to detect if lights are ON/OFF in a classroom and change the status in the Database.

Priority:-

- It is a High priority feature it must be present for the system to run.

Stimulus:-

- No stimulus needed

Response Sequences:-

- The software will check Whether lights are ON/OFF in the Room using a Live Feed from the CCTV Camera installed in Classroom/Lab.
- Update the Database

4.3.Check Lab/Classroom Status:-

The software should be able to tell if a Classroom is Empty or Full by using Human and Light Detection. Show the list of the classroom's status on the Admin portal.

Priority:-

- It is a High priority feature. It must be present for the system to serve its purpose.

Stimulus:-

- The software detected no human in a Classroom/Lab.

Response Sequences:-

- Checking the Database
- Update the Status list of the classrooms/labs.

4.4.Access log:-

The software should be able to store and show the Access time of a classroom using Human Detection.

Priority:-

- It is a low priority feature. It is an additional feature.

Stimulus:-

- Change in Classroom/lab Status.

Response Sequences:-

- Checking the Database
- The software will record the time of Change in the Database to find the Access time of the classroom.
- Store the Last Access time of a Classroom/lab in the Database.

4.5.Send Live Update:-

The software should be able to send Live update to the Admins Whenever a classroom status changes to Empty, but Lights are Detected ON.

Priority:-

- It is a Medium priority feature. It is an additional feature.

Stimulus:-

- If no Human is detected, the lights are detected ON.

Response Sequences:-

- Send a Live Update to the Admin by highlighting the classroom Name

5. Other Nonfunctional Requirements

5.1. Performance Requirements

The system must be able to click clear pictures of the given room repeatedly in specific time intervals and transit them to the server successfully. The server must be able to detect light and human presence with accuracy and precision quickly and henceforth update the classroom status.

The camera must be a (camera must be of 12 MP or higher). There must be a good Network connection with Camera (approx. 10MB/sec link speed).

5.2. Safety Requirements

As such the system is a secure gateway and there should not be any loss, damage or harm that could result from the use of the product. However, if in use then there must be a notice that signifies people that there images are being captured.

5.3. Security Requirements

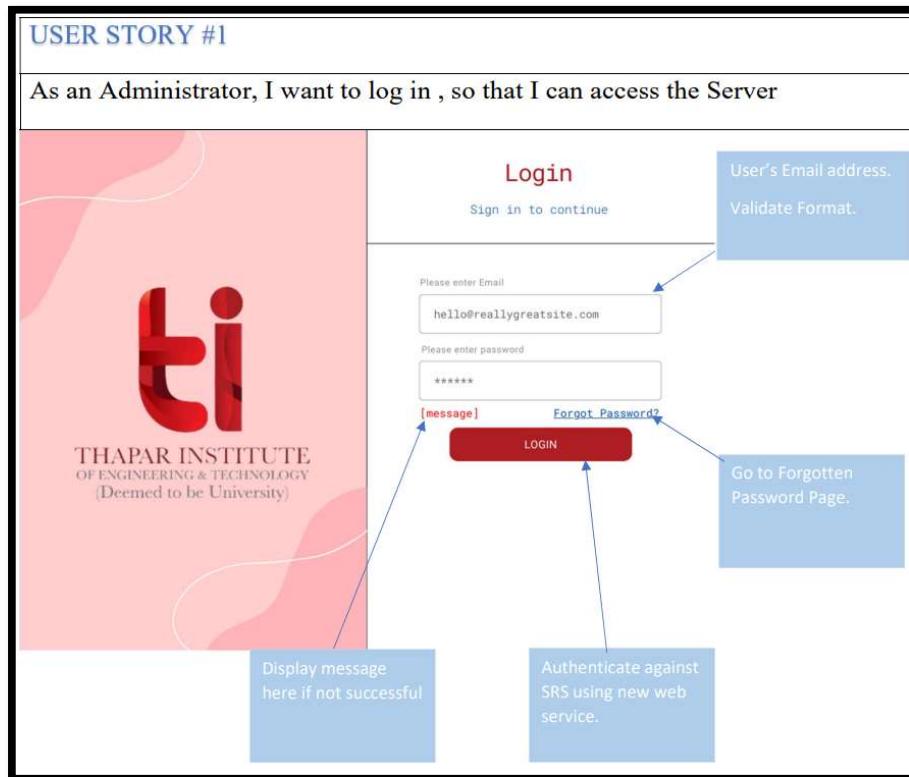
The camera must be placed in such a way that there is no chance of it getting damaged due to the activities that happen in its surroundings. The admin must change his/her password in every two weeks to avoid any illegal entry from entities such as hackers from the outside world. Moreover he/ she must not use the system from any more than two devices. The password should be very strong and should not be shared with anyone. Furthermore, the data gathered from the server should not be trackable (HTTPS)

Appendix A: Glossary

- **Access Control:** - Access control is a security technique that regulates who or what can view or use resources in a computing environment. It is a fundamental concept in security that minimizes risk to the business or organization.
- **CITM:** - It stands for Certified Information Technology Manager. The CITM will review such key areas as corporate frameworks, software, databases, information systems, communications and management of personnel in relation to technology and from the point of view of the business manager.
- **CNN:** - It stands for Convolutional Neural Network. It is a class of neural networks that specializes in processing data that has a grid-like topology, such as an image.
- **CPU:** - It stands for Central Processing Unit. It is the component of a computer system that controls the interpretation and execution of instructions. The CPU of a PC consists of a single microprocessor, while the CPU of a more powerful mainframe consists of multiple processing devices, and in some cases, hundreds of them.
- **FTP:** - It stands for File Transfer Protocol. It is a standard communication protocol used for the transfer of computer files from a server to a client on a computer network.
- **GPU:** - Its stands for Graphics Processing Unit. It is a specialized electronic circuit designed to manipulate and alter memory to accelerate the creation of images in a frame buffer intended for output to a display device.
- **HTTPS:** - Its stands for Hypertext Transfer Protocol Secure. It is a combination of the Hypertext Transfer Protocol (HTTP) with the Secure Socket Layer (SSL)/Transport Layer Security (TLS) protocol. TLS is an authentication and security protocol widely implemented in browsers and Web servers.

- **OpenCV:** - It stands for Open Source Computer Vision. It is an open-source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products.
- **Pilot Phase:** - The pilot project is an initial small-scale implementation that is used to prove the viability of a project idea. This could involve either the exploration of a novel new approach or idea or the application of a standard approach recommended by outside parties but which is new to the organization.
- **Stimulus:** - A stimulus is something that incites to action or exertion or quickens action.
- **TCP:** - It stands for Transmission Control Protocol. It is one of the main protocols of the Internet protocol suite. It lies between the Application and Network Layers which are used in providing reliable delivery services. It is a connection-oriented protocol for communications that helps in the exchange of messages between the different devices over a network.
- **UDP:** - It stands for User Datagram Protocol. It operates on top of the Internet Protocol (IP) to transmit datagrams over a network. UDP does not require the source and destination to establish a three-way handshake before transmission takes place. Additionally, there is no need for an end-to-end connection.
- **YOLOv3:** - It stands for You Only Look Once version 3. It is a real-time object detection algorithm that identifies specific objects in videos, live feeds, or images. The YOLO machine learning algorithm uses features learned by a deep convolutional neural network to detect an object.

2.6 User story and User cards

Front sideBack side**Confirmation**

1. Success – Valid User logged in and referred to the home page
2. Failure – Display Message
 - a) “Email or password is Incorrect, please try again”
 - b) “Service unavailable, please try again later”

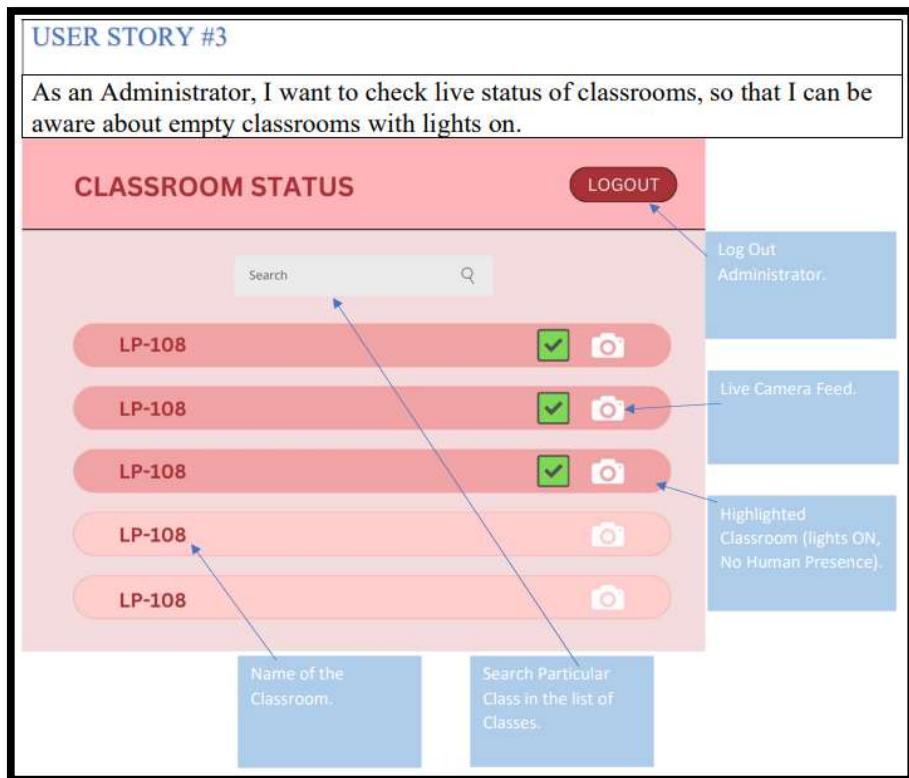
Front side



Back side

Confirmation

1. Success – Password is reset
2. Failure – Display Message
 - a) “OTP is wrong”
 - b) “Passwords do not match”
 - c) “Service unavailable, please try again later”

Front sideBack side

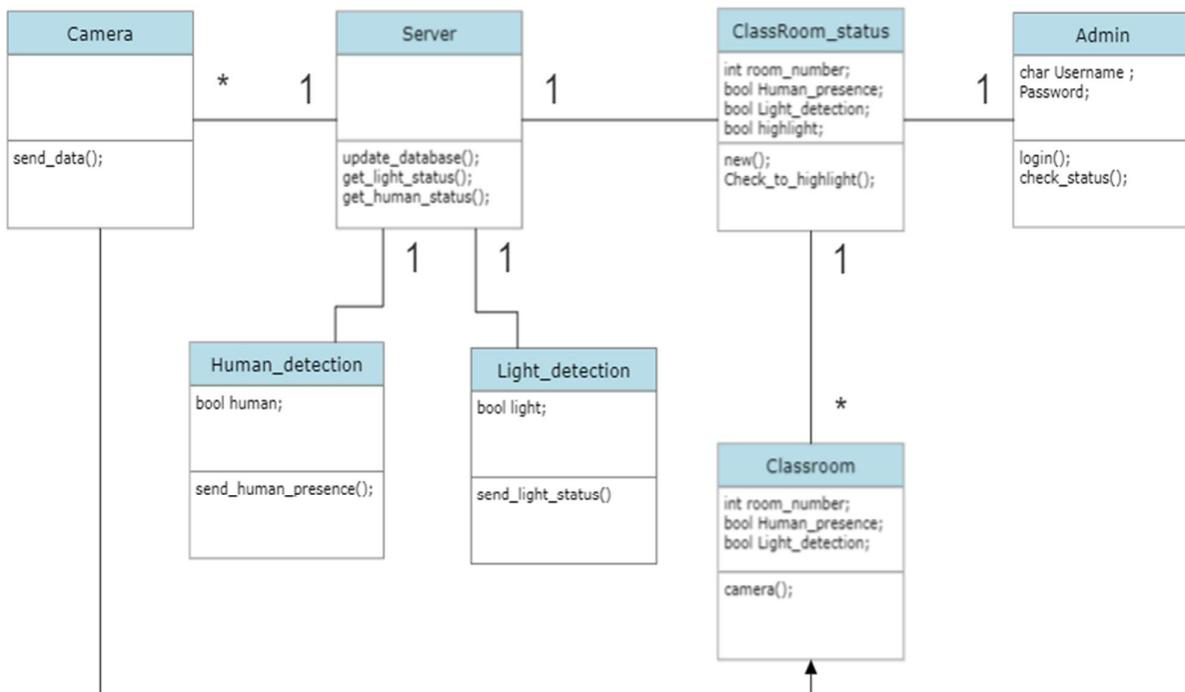
Confirmation

1. Success
 - a) Display Message – “User is successfully logged Out”.
 - b) Displayed the Live Classroom status.
2. Failure – Display Message
“Service unavailable, please try again later”.

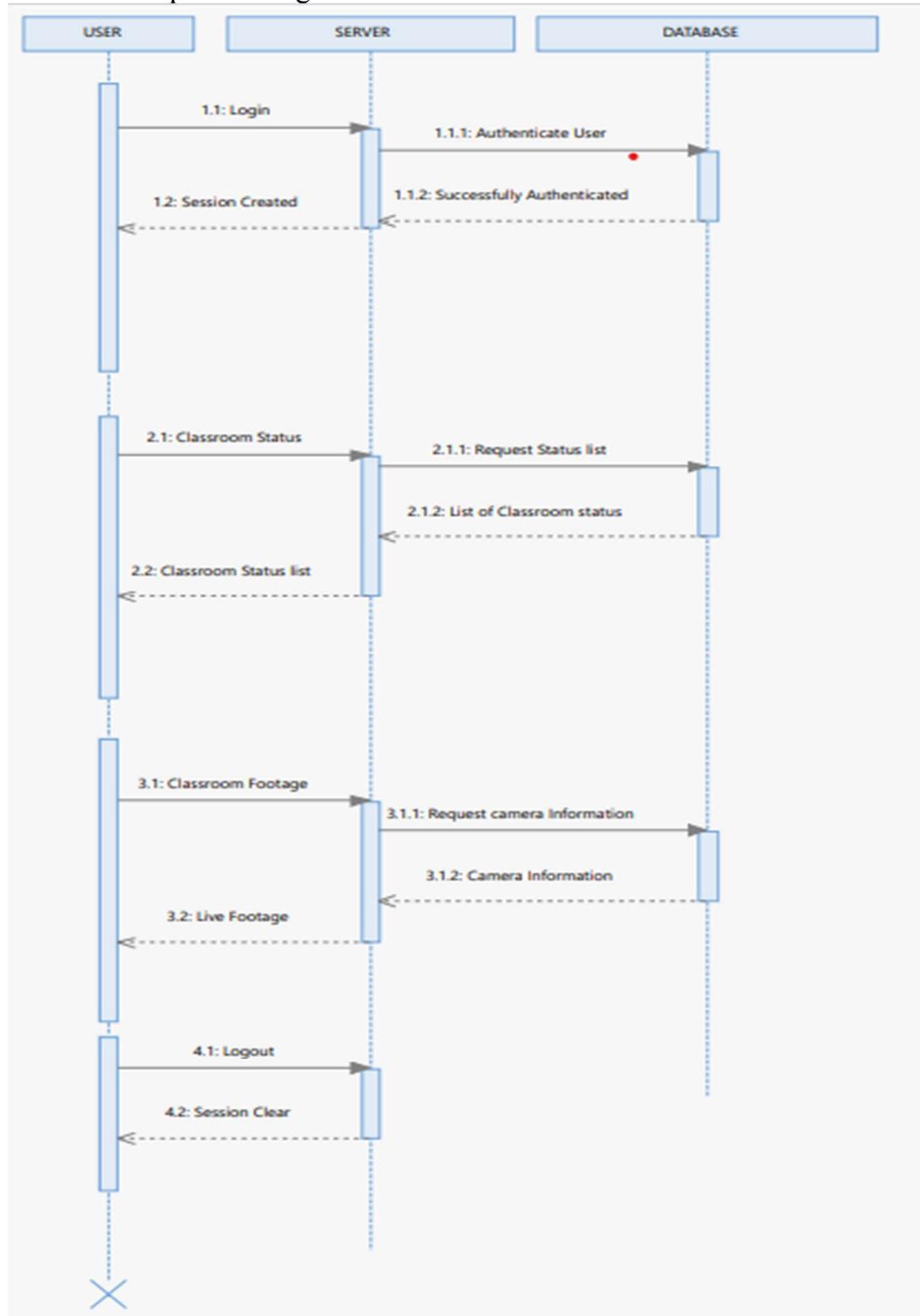
3. Design Phase

3.1 Class Diagram

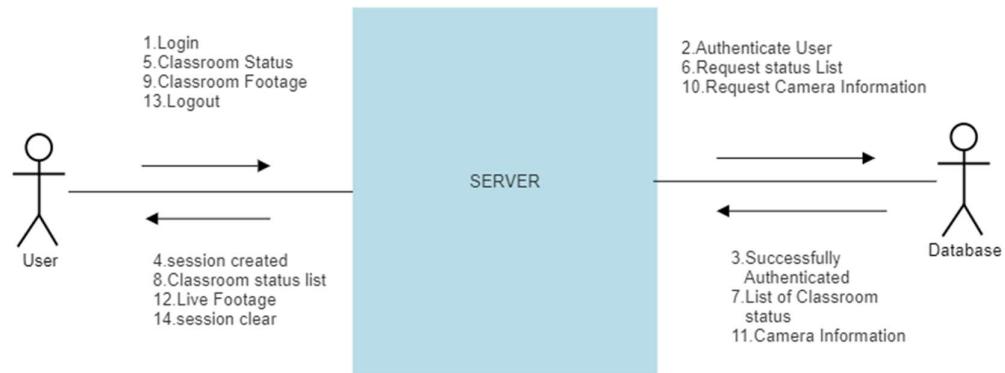
The class diagram is as follows:



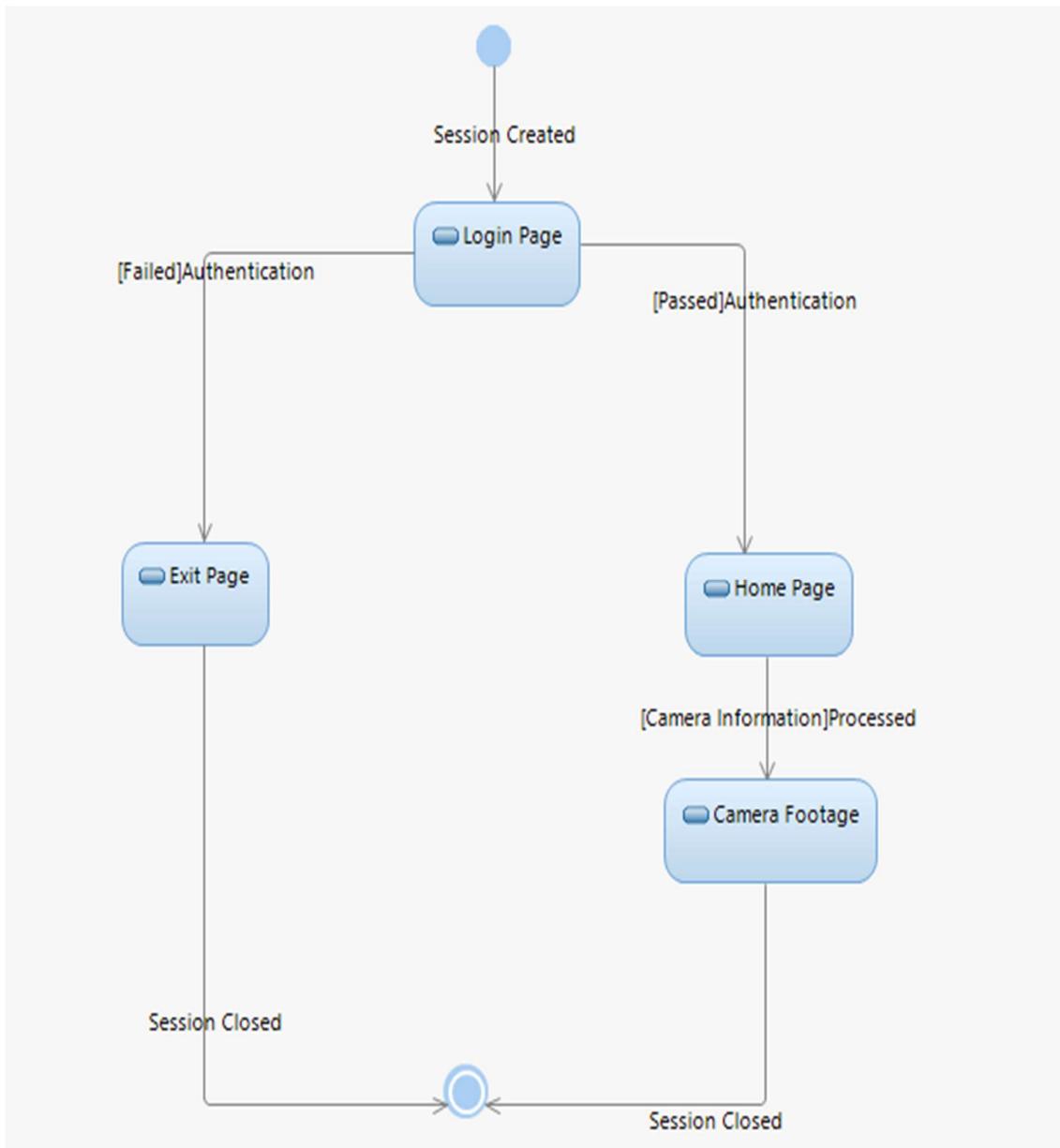
3.2 Sequence Diagram



3.3 Collaboration Diagram

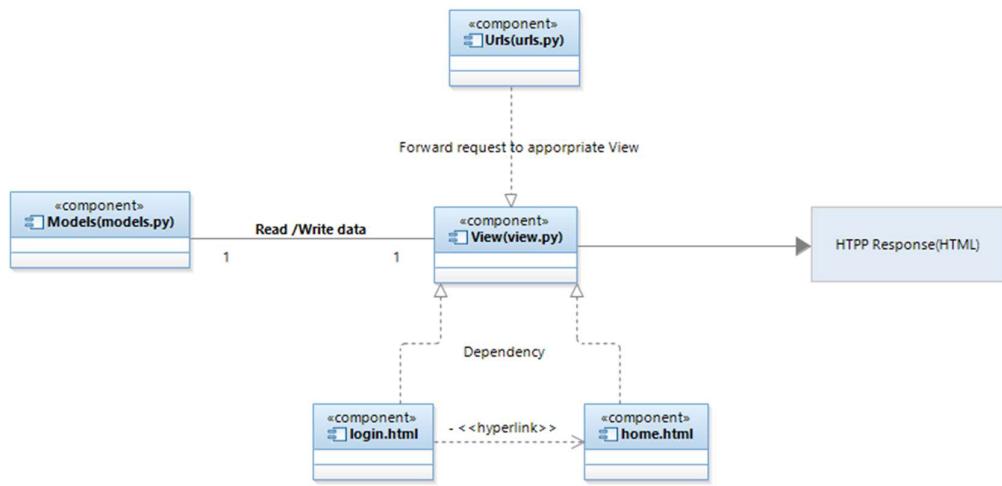


3.4 State Chart Diagrams

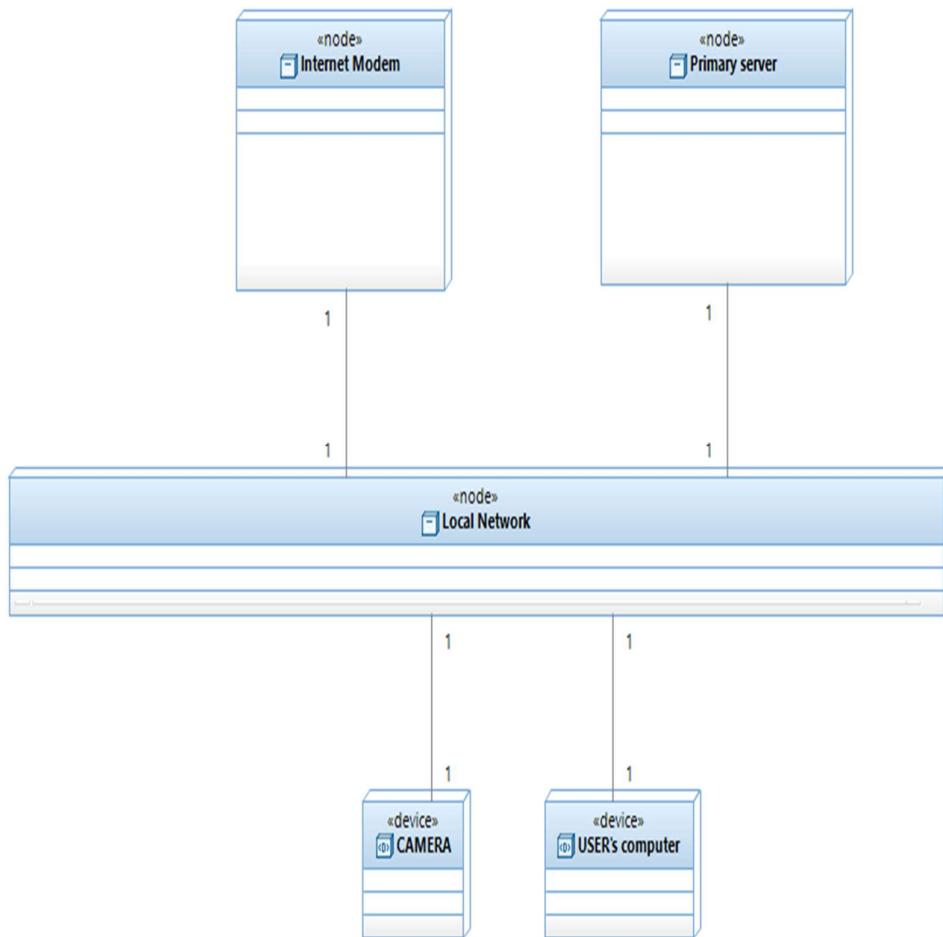


4. Implementation

4.1 Component Diagrams



4.2 Deployment Diagrams



4.3 Screenshots

The image displays two screenshots of a mobile application interface for Thapar Institute. Both screenshots feature a pink background with white wavy lines and the institute's red 'ti' logo.

Screenshot 1: Login Screen

This screen shows a 'Login' header and a 'Sign in to continue' link. It includes fields for email ('Please enter Email') containing 'hello@reallygreatsite.com' and password ('Please enter password') containing '*****'. There are links for '[message]' and 'Forgot Password?'. A large red 'LOGIN' button is at the bottom.

Screenshot 2: Forgot Password Screen

This screen shows a 'Forgot Password' header and a 'Generate new password' link. It includes a field for email ('Please enter Email') containing 'hello@reallygreatsite.com' and a red 'SEND' button at the bottom.



THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

Reset Password

Set new password

Please enter OTP

Please enter new password

Re-enter new password

[message]

SET PASSWORD



CLASSROOM STATUS

Logout

CLASS NAME	CHECK LIVE CAM
LPI01	
LPI02	
LPI03	
LPI04	

5. Testing

5.1 Test Plan

We plan to implement these functionalities for LP-110 with an audience of 7 people as part of the Pilot Phase. Once the Pilot Phase is successful then we plan to implement it in other classrooms across the institute and eventually we plan to extend the CNN based Human Detection to Save Electricity

Testing

1. Login

The admin will try to login to server

2. Reset password

The admin will try to reset password which is forgotten

3. Check classroom Status

Once Logged in Admin will try to check classroom Status

4. View Camera Live Footage

Once Logged in Admin will try to access camera footage of class through website

5.2 Test Cases

Test Case: 1 System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin needs to login to the admin panel	Test Case Name: Login to Admin panel Subsystem: Email, Password Design Date: 25/10/2022 Execution Date: 27/10/2022
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Pre Conditions The user has a valid email and password The current email is incognito@thapar.edu The current password is incognito1234 The website displays the login portal

Step	Action	Expected System Response	Pass/Fail	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field		
2	Enter "incognito1234" as the password	The webpage puts the password in the password field		
3	Click 'LOGIN' button	The webpage shows a message of successful operation and logs you in to the admin panel		
4	Check post-condition 1			
5	Repeat steps 1,2,3 with another email say "icog@thapar.edu"	The webpage shows a message of unsuccessful operation that the user does not exist		
6	Check post-condition 2			
7	Repeat step 1,2,3 with another password say "icog1234"	The webpage shows a message of unsuccessful operation that the password entered is wrong		

Post Condition: The admin is logged into the system to access the admin panel.
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Test Case: 2 System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin needs to change the forgotten password	Test Case Name: Reset Password Subsystem: Email, Password Design Date: 25/10/2022 Execution Date: 27/10/2022
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Pre Conditions The user has a valid email The current email is incognito@thapar.edu The website displays the forgot password portal

Step	Action	Expected System Response	Pass/Fail	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field		
2	Click on the "SEND" button	The webpage redirects you to the change password portal		
3	Enter the OTP received on the email provided, say "6666"	The webpage shows the OTP in the OTP field		
4	Enter the new password say "ico1234".	The webpage puts the password in the password field.		
5	Re-enter "ico1234" to confirm password	The webpage puts the password in the confirm password field		
6	Click on the "SUBMIT" button.	The webpage shows a message of successful operation and asks the admin to login with the new password.		
7	Check post-condition 1			
8	Repeat steps 1,2,3,4,5,6 with a wrong OTP, say "7777"	The webpage shows a message of unsuccessful operation that the OTP provided is incorrect.		
9	Check post-condition 2			
10	Repeat step 1,2,3 ,4	The webpage puts the OTP and password in the OTP field and password field respectively.		
11	Enter a wrong confirmation password say "icog2345"	The webpage puts the password in the confirm password field		
12	Click on the "SUBMIT" button.	The webpage shows a message of unsuccessful operation that the passwords do not match		

Post Condition: The admin has successfully changed the forgotten password.
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Test Case: 3 System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin needs to Check classroom Status	Test Case Name: Classroom Status Subsystem: Email, Password Design Date: 22/11/2022 Execution Date: 22/11/2022
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Pre Conditions The user has a valid email and password The current email is incognito@thapar.edu The current password is incognito1234 The website displays the login portal

Step	Action	Expected System Response	PASS/FAIL	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field		
2	Enter "incognito1234" as the password	The webpage puts the password in the password field		
3	Click 'LOGIN' button	The webpage shows a message of successful operation and logs you in to the admin panel		
4		Homepage is shown with list of Classroom Status		

Post Condition: The admin is logged into the system to access the admin panel.
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Test Case: 4 System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin see the live footage of the classroom	Test Case Name: Camera Footage Subsystem: Email, Password Design Date: 22/11/2022 Execution Date: 22/11/2022
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Pre Conditions The user has a valid email and password The current email is incognito@thapar.edu The current password is incognito1234 The website displays the login portal

Step	Action	Expected System Response	PASS/FAIL	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field		
2	Enter "incognito1234" as the password	The webpage puts the password in the password field		
3	Click 'LOGIN' button	The webpage shows a message of successful operation and logs you in to the admin panel		
4		Homepage is shown with list of Classroom Status		
5	Click on Camera Icon Next to Classroom name	User is redirected to Camera webpage and live footage is shown		

Post Condition: The admin is logged into the system to access the admin panel.
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5.3 Test Reports

Test Case: System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin needs to login to the admin panel	Test Case Name: Login to Admin panel Subsystem: Email, Password Design Date: 25/10/2022 Execution Date: 27/10/2022
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Pre Conditions The user has a valid email and password The current email is incognito@thapar.edu The current password is incognito1234 The website displays the login portal

Step	Action	Expected System Response	Pass/Fail	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field	Pass	
2	Enter "incognito1234" as the password	The webpage puts the password in the password field	Pass	
3	Click 'LOGIN' button	The webpage shows a message of successful operation and logs you in to the admin panel	Pass	
4	Check post-condition 1			
5	Repeat steps 1,2,3 with another email say "icog@thapar.edu"	The webpage shows a message of unsuccessful operation that the user does not exist	Pass	
6	Check post-condition 2			
7	Repeat step 1,2,3 with another password say "icog1234"	The webpage shows a message of unsuccessful operation that the password entered is wrong	Pass	

Post Condition: The admin is logged into the system to access the admin panel.
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Test Case: System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin needs to change the forgotten password	Test Case Name: Reset Password Subsystem: Email, Password Design Date: 25/10/2022 Execution Date: 27/10/2022
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Pre Conditions The user has a valid email The current email is incognito@thapar.edu The website displays the forgot password portal

Step	Action	Expected System Response	Pass/Fail	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field	Pass	
2	Click on the "SEND" button	The webpage redirects you to the change password portal	Pass	
3	Enter the OTP received on the email provided, say '6666'	The webpage shows the OTP in the OTP field	Pass	
4	Enter the new password say "ico1234".	The webpage puts the password in the password field.	Pass	
5	Re-enter "ico1234" to confirm password	The webpage puts the password in the confirm password field	Pass	
6	Click on the "SUBMIT" button.	The webpage shows a message of successful operation and asks the admin to login with the new password.	Pass	
7	Check post-condition 1			
8	Repeat steps 1,2,3,4,5,6 with a wrong OTP, say "7777"	The webpage shows a message of unsuccessful operation that the OTP provided is incorrect.	Pass	
9	Check post-condition 2			
10	Repeat step 1,2,3,4	The webpage puts the OTP and password in the OTP field and password field respectively.	Pass	
11	Enter a wrong confirmation password say "icog2345"	The webpage puts the password in the confirm password field	Pass	
12	Click on the "SUBMIT" button.	The webpage shows a message of unsuccessful operation that the passwords do not match	Pass	

Post Condition: The admin has successfully changed the forgotten password.
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Test Case: 3 System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin needs to Check classroom Status	Test Case Name: Classroom Status Subsystem: Email, Password Design Date: 22/11/2022 Execution Date: 22/11/2022
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Pre Conditions The user has a valid email and password The current email is incognito@thapar.edu The current password is incognito1234 The website displays the login portal

Step	Action	Expected System Response	PASS/FAIL	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field	Pass	
2	Enter "incognito1234" as the password	The webpage puts the password in the password field	Pass	
3	Click 'LOGIN' button	The webpage shows a message of successful operation and logs you in to the admin panel	Pass	
4		Homepage is shown with list of Classroom Status	Pass	

Post Condition: The admin is logged into the system to access the admin panel.
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Test Case: 4 System: Personal Computer Designed by: Incognito Executed by: Administrator Short Description: The admin see the live footage of the classroom	Test Case Name: Camera Footage Subsystem: Email, Password Design Date: 22/11/2022 Execution Date: 22/11/2022
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Pre Conditions The user has a valid email and password The current email is incognito@thapar.edu The current password is incognito1234 The website displays the login portal

Step	Action	Expected System Response	PASS/FAIL	Comment
1	Enter "incognito@thapar.edu" as the email	The webpage shows incognito@thapar.edu in the email field	Pass	
2	Enter "incognito1234" as the password	The webpage puts the password in the password field	Pass	
3	Click 'LOGIN' button	The webpage shows a message of successful operation and logs you in to the admin panel	Pass	
4		Homepage is shown with list of Classroom Status	Pass	
5	Click on Camera Icon Next to Classroom name	User is redirected to Camera webpage and live footage is shown	Pass	

Post Condition: The admin is logged into the system to access the admin panel.
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6. LINKS

GitHub Repository link - <https://github.com/Chandravo/CNN-based-human-detection-to-save-electricity>