

Intelligent Home Security

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled “**Intelligent Home Security**”, submitted by **Sohrab Abedin Bhuiyan** Id: **141-15-3097** and **Amir Ahmed** Id: **162-15-8178** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **27th January 2021**.

BOARD OF EXAMINERS



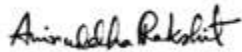
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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Dr. Syed Akhter Hossain**, Professor, Department of CSE, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

Artificial Intelligence makes our life easier and more comfortable. Machines are starting to learn and act like humans. Difficult Problems can be easily solved by the help of Artificial Intelligence. Our project is named “Intelligent Home Security”. Nowadays use of Surveillance cameras, Closed Circuit or IP cameras are increasing for home security purposes. If any unexpected incident occurs a security person has gone through all video recordings to find the desired video footage which is a very time-consuming procedure. Our application provides an Intelligent Surveillance facility by recognizing faces in the entrance point of an apartment and track time on entrance or departure of known or unknown persons. This application also stores entrance and departure time of every known and unknown person. Our application also contains some features like login, registration, keeping data of residents, showing real-time data on table etc. Our application will make home security systems more easier and time efficient for ensuring security of people.

TABLE OF CONTENTS

CONTENTS

Board of examiners	ii
Declaration.....	iii
Acknowledgements	iv
Abstract	v

CHAPTER

CHAPTER 1: INTRODUCTION	1
1.1 Introduction	1
1.2 Motivation	2
1.3 Objective	2
1.4 Expected Outcome	3
CHAPTER 2: BACKGROUND.....	4
2.1 Introduction	4
2.2 Related Works	4
2.3 Comparative Studies	4
2.4 Scope of the Problem	5
2.5 Challenges	5
CHAPTER 3: REQUIREMENT SPECIFICATION	6
3.1 Business Process Model	6
3.2 Use Case Modelling and Description	7

CHAPTER 4: DESIGN SPECIFICATION	11
4.1 Front-end Design	11
4.2 Backend Design	17
CHAPTER 5: IMPLEMENTATION and TESTING	19
5.1 Implementation of Front-end Design	19
5.2 Implementation of Database	24
5.3 Testing Implementation & Result	24
CHAPTER 6: IMPACT on SOCIETY & SUSTAINABILITY.....	26
6.1 Impact on Society	26
6.2 Ethical Access	27
6.3 Sustainability Plan	27
CHAPTER 7: CONCLUSION & FUTURE SCOPE	28
7.1 Conclusion.....	28
7.2 Future Scope	28
REFERENCES	29

LIST OF FIGURES

FIGURES	PAGE NO
Figure 3.1: Business Case Model	6
Figure 3.2.1: Flow of Data in The System	7
Figure 3.2.2: Use Case of Admin Registration	8
Figure 3.2.3: Use Case of Resident Registration	9
Figure 4.1.1: Login Page	11
Figure 4.1.2: Sign-up page	12
Figure 4.1.3: Home Page	13
Figure 4.1.4: Data Box Table	14
Figure 4.1.5: Resident Registration Form	14
Figure 4.1.6: Registered Resident List	15
Figure 4.1.7: Registered Resident Information	15
Figure 4.1.8: Editing Resident Information	16
Figure 4.1.9: About Us Page	16
Figure 4.2.1: Admin Information	17
Figure 4.2.2: Data in CSV File	18
Figure 5.1.1: Sign-up Process	19
Figure 5.1.2: Login Process	19
Figure 5.1.3: Resident Registration Process	20
Figure 5.1.4: Resident Information Updating Process	20
Figure 5.1.5: Resident Updated Information	21
Figure 5.1.6: Resident Information deleting process	21
Figure 5.1.7: Constraint for Login	22

Figure 5.1.8: Constraint for Resident Registration	22
Figure 5.1.9: Constraint for Assuring Privacy	23
Figure 5.2.1: Model of Data	24
Figure 5.3.1: Live Stream	25
Figure 5.3.2: Expected Result	25

CHAPTER 01

INTRODUCTION

1.1 Introduction

Home security systems are widely used in apartments, industrial areas and commercial areas for surveillance and security purposes. Surveillance camera can perform live video streaming, video recording and storing facility but It don't have any brain to recognize a person's face to track time and other useful data. It is not efficient for a person to go through all video footage to find out any occurrence or any unexpected incident's clip. This is very time consuming. Some commercial agencies have a branch of manpower to continuously watch CCTV monitor screens but a resident apartment does not have enough security guards.

In order to solve this problem, we need to think in an efficient and more resourceful way. Our "Intelligent Home Security System" is developed using python's web framework Django and for face recognition functionality Artificial-Intelligence is used. In front of the entrance point surveillance camera get the live video footage then our web-based application will recognize that face, if that person is registered otherwise that person will be identified as an unknown person and it will generate and store data on excel file also on html table with entrance or departure time. So, if an unexpected incident occurs then it will be more efficient to find out the correct occurrence time based on every known or unknown person's entry or departure time.

1.2 Motivation

Most of the things that have been invented in this world is to solve some sort of problem for human kind. Our application improves efficiency for security surveillance systems.

Usually we use CCTV or IP cameras for our security system. But it is not possible to keep our eyes on monitor for a long time. So, any incident can happen any time. For checking this incident from data-storage, we have to search the whole footage which is very time consuming. By using our project, we can easily detect and recognize faces depending on the time of entrance and departure of the person. By this process we can easily search this footage and find out the problem.

Moreover, we can also store daily data on a database depending on the date. That data we can use for analysis faces which is harmful for the security of the apartment or house.

1.3 Objective

The main objective of our application is to improve surveillance security systems by implementing Artificial Intelligence. With the help of Artificial Intelligence, a surveillance security system can improve performance.

The key objects of the project are as follows:

- Generating list of entry and exit data of resident and outsiders in excel shit to reduce data entry hassle.
- Saving time by recognizing and identifying people by Intelligent systems.
- Identifying suspicious people who are living in the house.
- Tracking an unknown person who has a relationship with the person who is living in the house.
- Observing their regular work for ensuring security of the house

1.4 Expected Outcome

- Use of this “Intelligent Home Security System” will reduce the risk of robing and other unexpected incidents.
- It would be easy to detect suspicious cases by tracking people’s movement and by recognizing faces.
- By data registration of each flat’s member on the database it will assure future security issues.

CHAPTER 2

BACKGROUND

2.1 Introduction

With the “Intelligent Home Security System” an owner can improve the security system of a residential area. Admin of the system gets all data of the apartment. We are trying to make security systems smarter through a CCTV or IP camera security system with face-recognition functionality.

2.2 Related Works

At present Google’s “nest hello video doorbell” which is an app-based application, provides smart doorbell facility and on the basis of subscription fee they provide face recognition features.

Features of Google’s Nest Hello Video Doorbell

- Free 3 hours image history of activity
- Have default and manual night vision mood
- Face-recognition feature and unlimited video storage on 5\$ of monthly subscription
- Motion detection feature

2.3 Comparative Studies

Nest hello video doorbell is the finished product of google but there is a matter of sorrow that google provides these products and features on some selected regions where Bangladesh is not included. Also, this product is very much expensive which costs around 229\$. On the other side our “Intelligent Home Security System” adds functionality on an

existing CCTV or IP camera security system. Our application is a web-based application which is cross platform which is able to run on Windows or Linux operating systems.

2.4 Scope of the Problems

- If a user's device does not have enough processing power then they face lezzy video streaming.
- If user have no internet connection, they cannot use our application
- A little bit costly of hosting as this website needs a good server and more data storage availability.
- Without 24/7 internet and electricity supply this application can't give proper security facilities.

2.5 Challenges

- **Building Realtime Table Update**

We face difficulties on real time data update in the html table. For real-time time data update and asynchronous data transmission in systems are needed which is an unknown and challenging topic for us.

- **Costly Hosting Price**

As web hosts and domain costs are very high to run this kind of website, a good server is needed which is costly. So, we host our project on a local server.

- **Continuous Internet Connection**

Continuous internet supply and maintain speed is also challenging in many of the places as many rural areas don't have good and continuous internet connectivity.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Model

This project holds the model for “Intelligent Home Security System”. This model provides an overview of the project. This application will be available for both the owner of the apartment and for the security person. It is a comparatively low-cost smart security system compared to other available products in the market. In figure (3.1) is shown the business process model provides the breakdown of the framework, deployment and the design of the application.

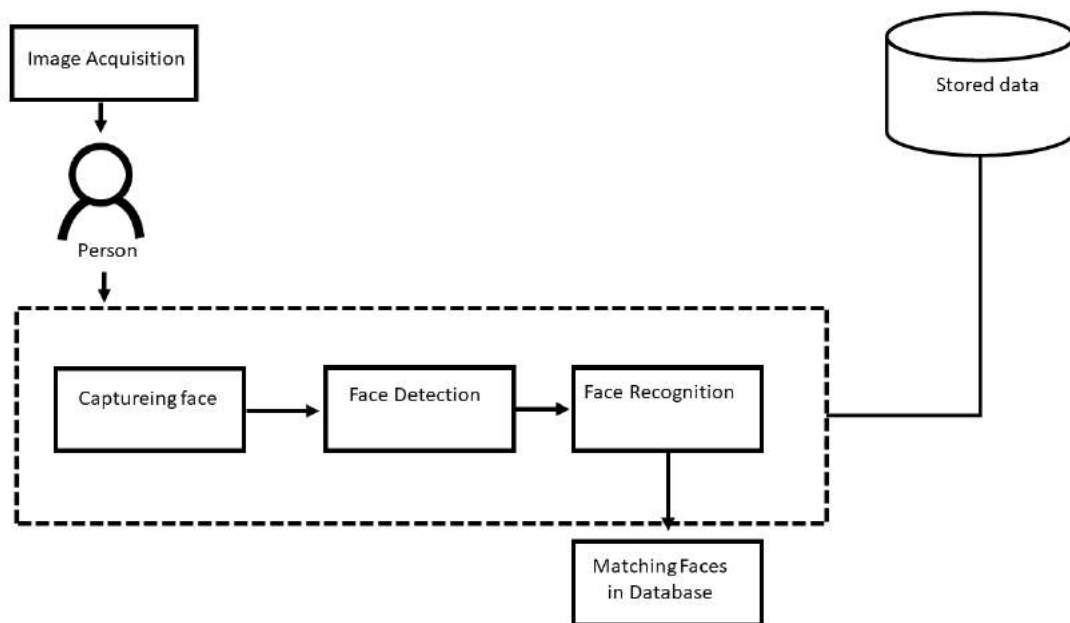


Figure 3.1: Business Case Model

3.2 Use Case Modelling and Description

- **Data Flow Diagram**

In figure (3.2.1) is shown data flow diagram where we can see that our application takes input images from live streaming. Then it would compare with resident images that are stored in database. Moreover, it would store arrival date, time and name of person.

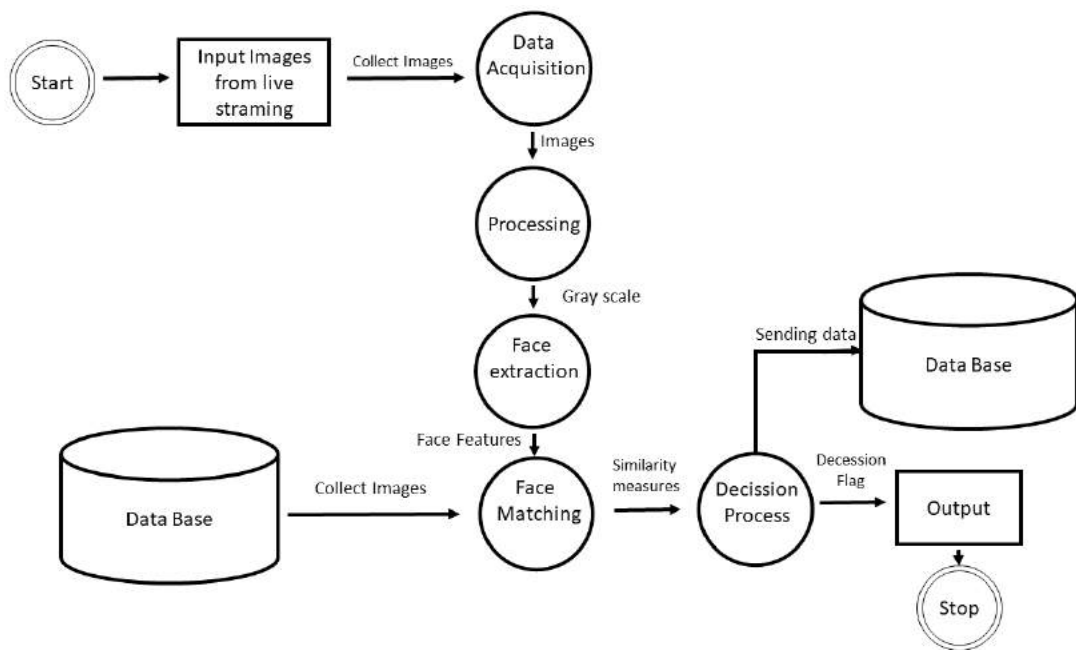


Figure: 3.2.1 Flow of Data in The System

- **Use Case for Admin Registration**

In figure (3.2.2) is shown use case for admin registration. If anybody want to use application, he has to complete registration. For successful registration, he has to provide this information.

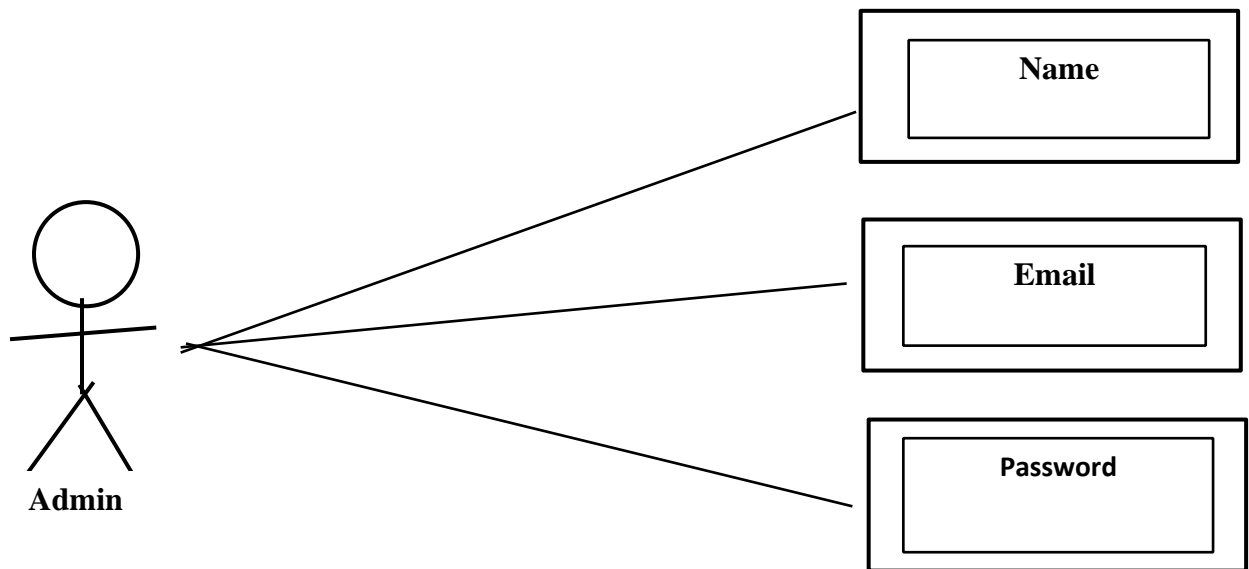


Figure 3.2.2 Use Case of Admin Registration

- **Use Case for Resident Registration**

In figure (3.2.3) is shown use case for resident registration. A resident has to give a bunch of required information to complete their profile. A resident's submitted information and image data will be used to detected known person.

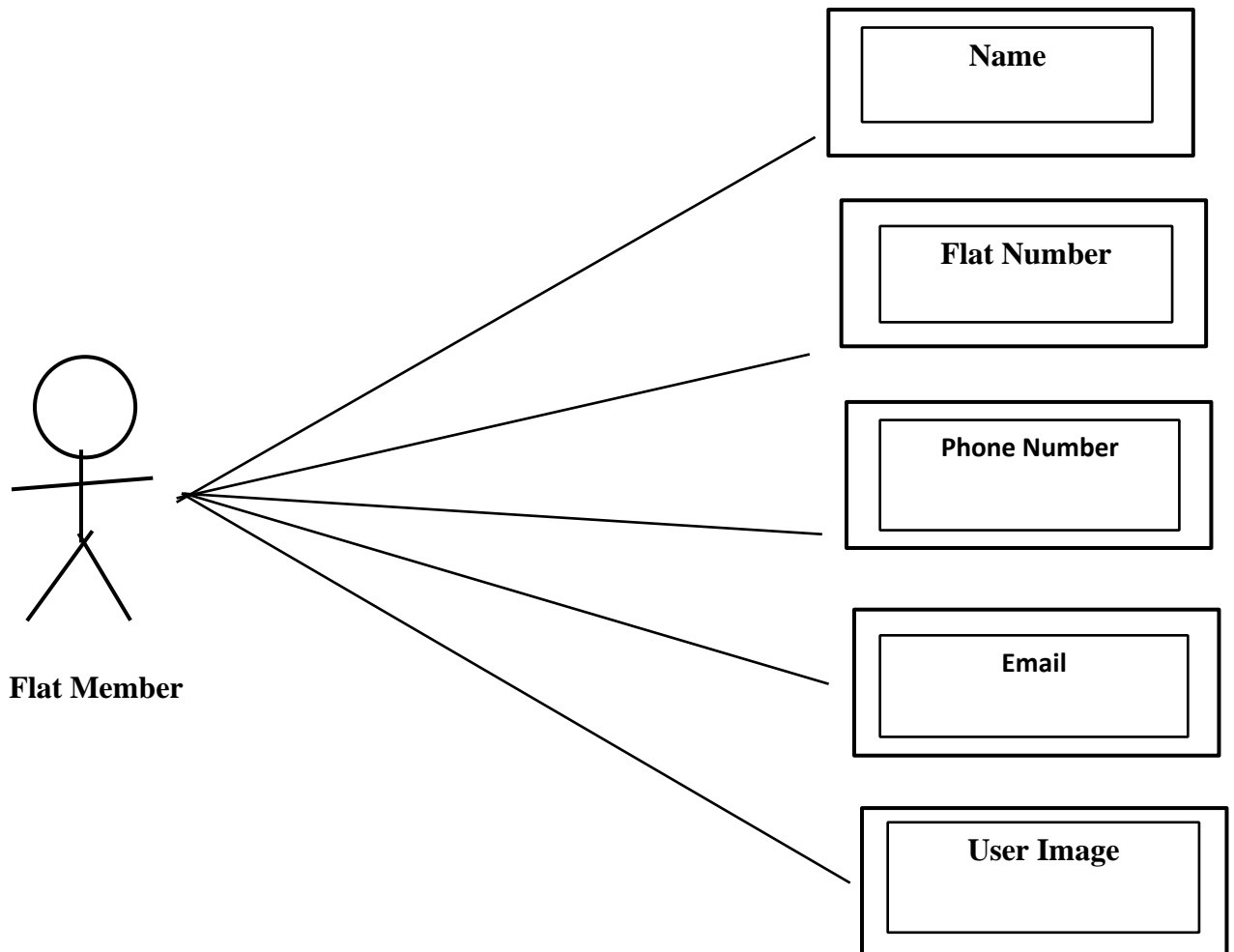


Figure 3.2.3 Use Case of Resident Registration

The use case diagram of our application is very simple. User has direct action which is sign up and log in. After login, the user will go to the home page. He can also move to a registered resident where he will find details, he can also edit and delete the details if he wants.

He can see the data about who is taking entry and exit from the house. He can also check the video storage from the hard drive if he assumes any suspicious case depending on time of entry or exit of a person.

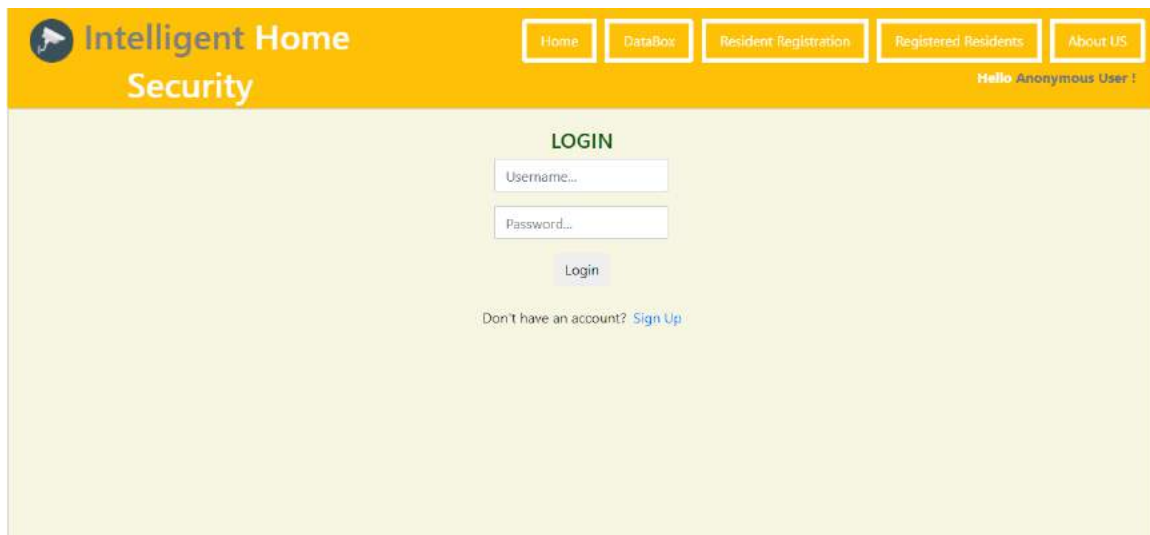
CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

- **Login and Sign-up**

At the starting of our application the user will find a login option in figure (4.1.1). If he has an account, he can log in using the username and password that he provided. In case he doesn't have an account, he has to go to the sign-up option and open an account by providing required information that we have shown in figure (4.1.2). After a user logs in he will find a home page.



The screenshot shows the login page for 'Intelligent Home Security'. The page has a yellow header with the logo and navigation links: Home, DataBox, Resident Registration, Registered Residents, and About US. A user greeting 'Hello Anonymous User!' is visible in the top right. The main content area is light green and features a 'LOGIN' section with two input fields for 'Username...' and 'Password...', a 'Login' button, and a link for 'Don't have an account? Sign Up'.

Figure 4.1.1: Login Page

Intelligent Home Security

Home DataBox Resident Registration Registered Residents About US

Hello Anonymous User!

Registration

Already have an account? [Login](#)

Name

Email

Password

Password Confirmation

Figure 4.1.2: Sign-up page

- **Home page**

In figure (4.1.3) is shown the home page, we have divided our home page into two parts. Here on the left side we are showing live video streaming that would come from CCTV cameras and on the right portion we have used it for showing advertisements that will be provided from the company for earning purpose. In the live streaming part, we have shown that our application can recognize more people simultaneously and can also separate known and unknown person. Known person would identify from resident information what they have provided through registration.

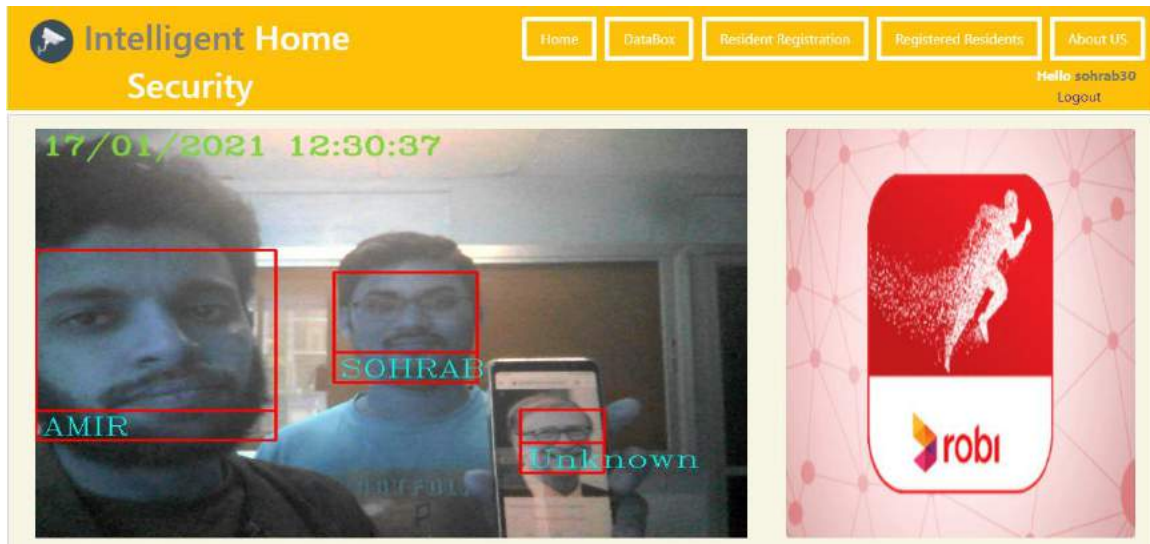


Figure 4.1.3: Home Page

- **Data Box**

In figure (4.1.4) is shown the data box page, we have shown our collected data from live video streaming. Depending on these names, date, time, entry and exit, we can check our video storage for analyzing suspicious cases.

Here all entry is yes and all exit is no because we have used only one camera. But in real life scenario we will use two cameras one is for recognizing faces in entry and another is for exit.

Index	Name	Date	Time	Entry	Exit
0	SOHRAB	17-01-2021	12:30:35	Yes	No
1	SOHRAB	17-01-2021	12:30:37	Yes	No
2	Unknown	17-01-2021	12:30:37	Yes	No
3	AMIR	17-01-2021	12:30:37	Yes	No
4	SOHRAB	17-01-2021	12:30:42	Yes	No
5	Unknown	17-01-2021	12:30:42	Yes	No
6	AMIR	17-01-2021	12:30:42	Yes	No
7	SOHRAB	17-01-2021	12:30:46	Yes	No
8	AMIR	17-01-2021	12:30:46	Yes	No
9	SOHRAB	17-01-2021	12:30:49	Yes	No

Figure 4.1.4: Data Box Table

- **Resident Registration**

In figure (4.1.5) is shown the resident registration page, we will enter resident details with an image who will live as a resident in our house. Depending on images we can recognize the person in a live video stream.

Figure 4.1.5: Resident Registration Form

- **Registered Resident list**

In figure (4.1.6) is shown an example of a list of residents who already have been registered.

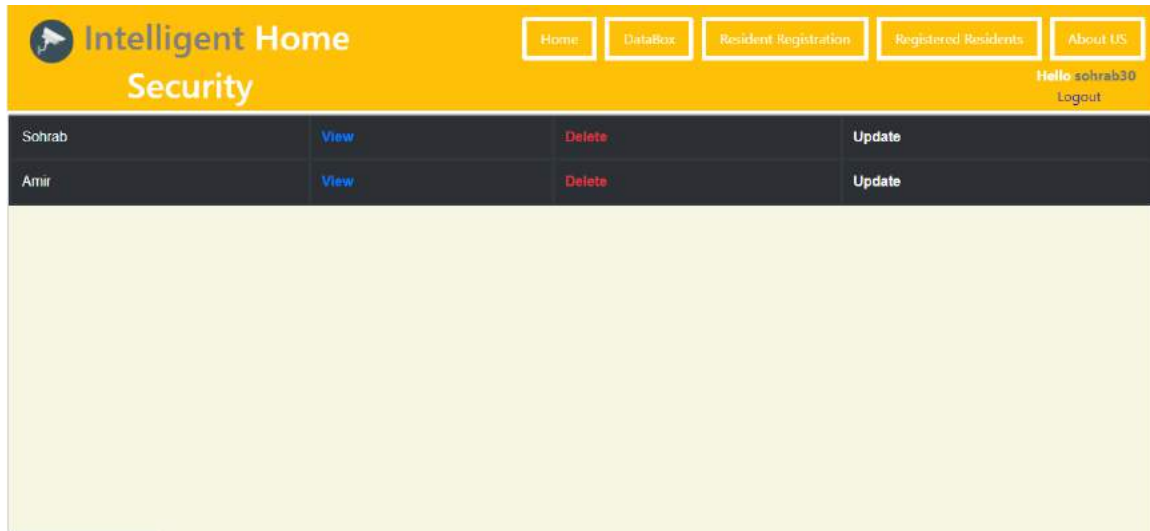


Figure 4.1.6: Registered Resident List

- **Registered Resident**

In figure (4.1.7) is shown the information of the registered resident.

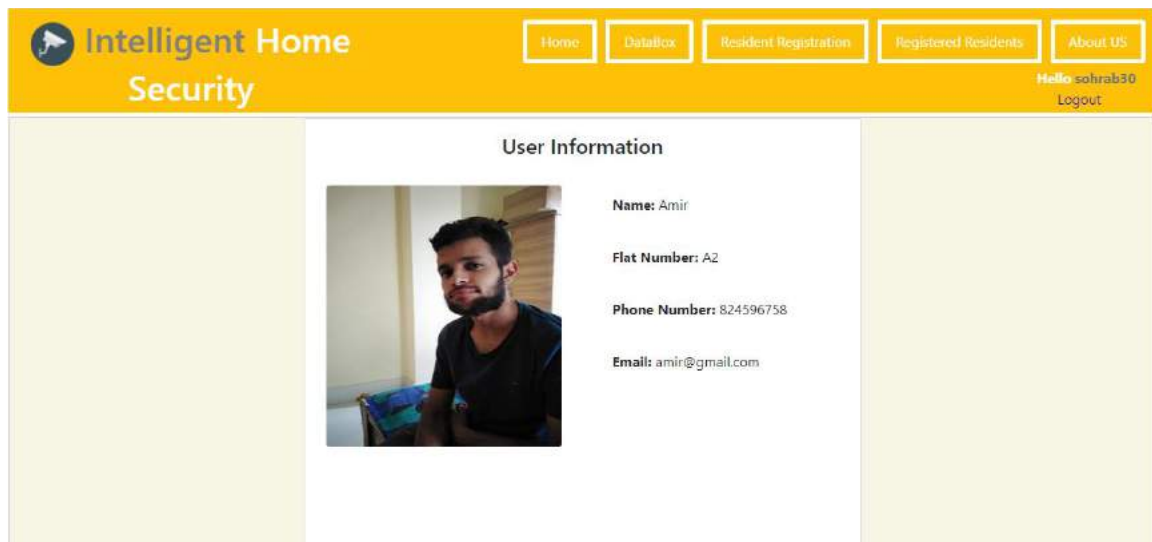


Figure 4.1.7: Registered Resident Information

- **Edit Details**

In figure (4.1.8) is shown the edit page and result after editing one of our resident information.

Intelligent Home Security

Home DataBox Resident Registration Registered Residents About US

Hello sohrab30
Logout

Edit Details

Name: Amir Ahmed

Flat: A2

Phone: 82455252

Email: amir@gmail.com

Image: Currently: Amir.jpg

Change: amir1.jpg

Figure 4.1.8: Editing Resident Information

- **About us**


In figure (4.1.9) is shown the information about developer of application.

Intelligent Home Security


Home DataBox Resident Registration Registered Residents About US

Hello sohrab30
Logout

Supervisor


Dr. Syed Akhter Hossain
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Team Member [lead]


Sohrab Abedin Bhuiyan
ID: 141-15-3097

Team Member



Amir Ahmed
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Figure 4.1.9: About Us Page

4.2 Backend Design

- **Admin Page**

In figure (4.2.1) is shown the admin information storing page. It is the built-in page that we get from Django through installing. We can access this page through creating super user by “createsuperuser” command.

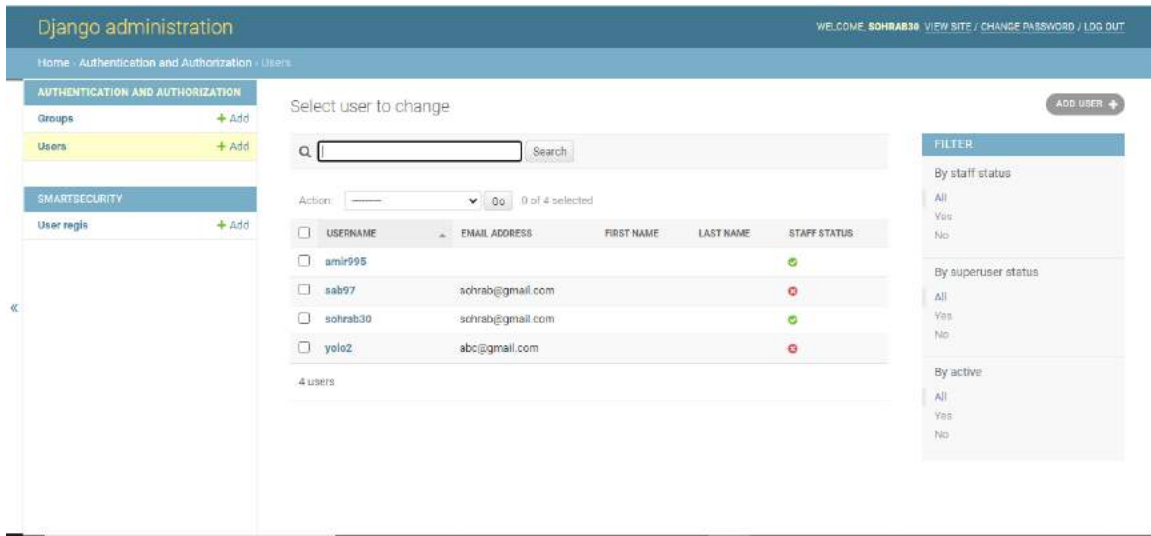


Figure 4.2.1: Admin Information

- **Collected data in csv format**

In figure (4.2.2) is shown data in csv format. Initially we store data in csv file. Then these data are shown in html table. We do it by JSON. In html table user can see updated data by refreshing. But user can not edit this data.

```
Attendance.csv
1 Name, Date, Time, Entry, Exit
2 SOHRAB,17-01-2021,12:30:10,Yes,No
3 AMIR,17-01-2021,12:30:10,Yes,No
4 SOHRAB,17-01-2021,12:30:14,Yes,No
5 Unknown,17-01-2021,12:30:14,Yes,No
6 SOHRAB,17-01-2021,12:30:17,Yes,No
7 SOHRAB,17-01-2021,12:30:20,Yes,No
8 Unknown,17-01-2021,12:30:20,Yes,No
9 SOHRAB,17-01-2021,12:30:23,Yes,No
10 Unknown,17-01-2021,12:30:23,Yes,No
11 SOHRAB,17-01-2021,12:30:26,Yes,No
12 SOHRAB,17-01-2021,12:30:35,Yes,No
13 SOHRAB,17-01-2021,12:30:37,Yes,No
14 Unknown,17-01-2021,12:30:37,Yes,No
15 AMIR,17-01-2021,12:30:37,Yes,No
16 SOHRAB,17-01-2021,12:30:42,Yes,No
17 Unknown,17-01-2021,12:30:42,Yes,No
18 AMIR,17-01-2021,12:30:42,Yes,No
19 SOHRAB,17-01-2021,12:30:46,Yes,No
20 AMIR,17-01-2021,12:30:46,Yes,No
21 SOHRAB,17-01-2021,12:30:49,Yes,No
```

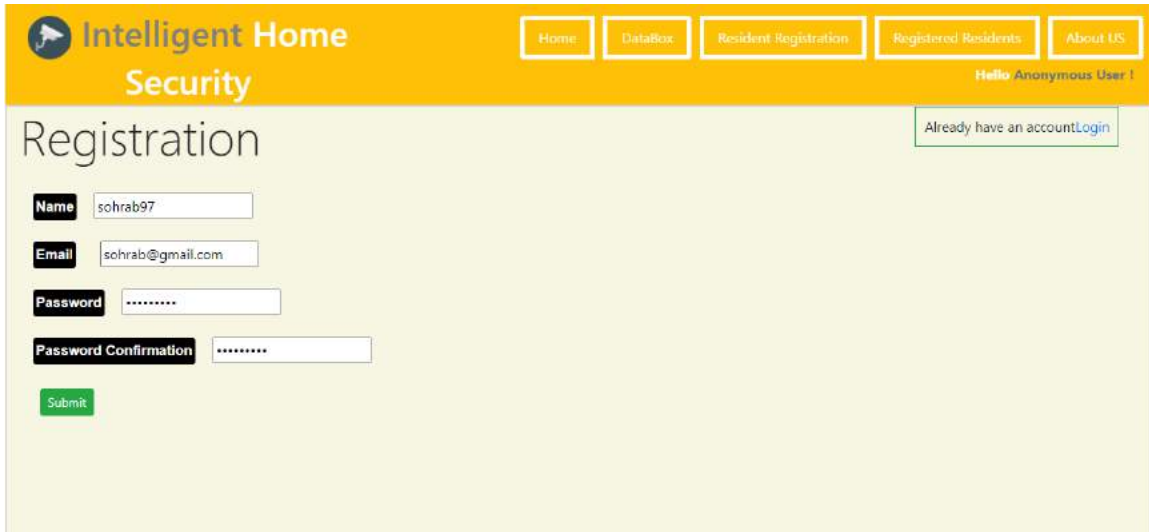
Figure 4.2.2: Data in CSV File

CHAPTER 5

IMPLEMENTATION and TESTING

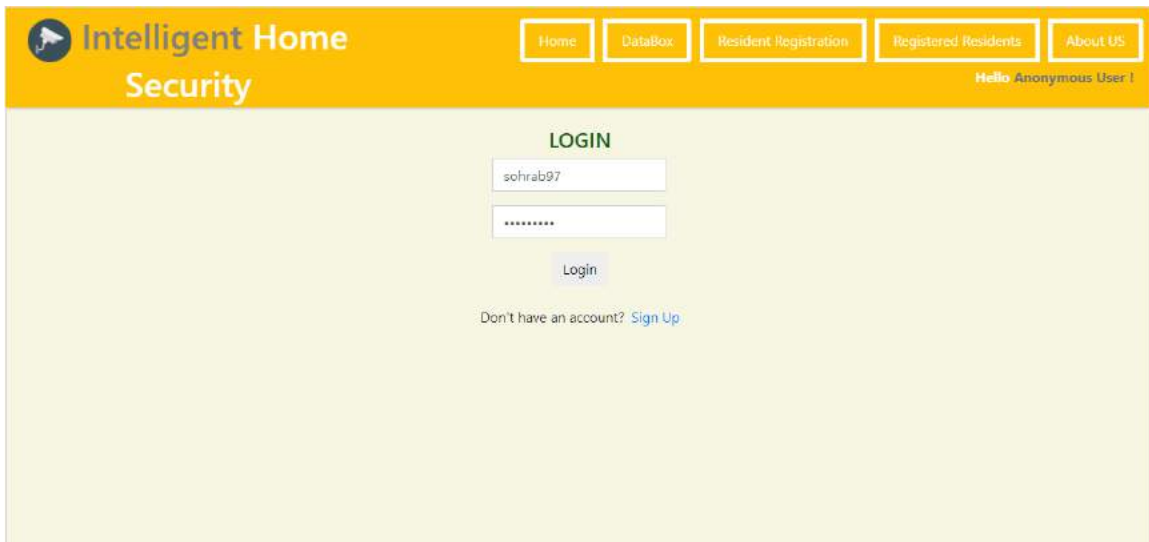
5.1 Implementation of Front-end Design

Here, we have shown that sign-up and login process in figure (5.1.1) and (5.1.2) of a new user.



The screenshot shows the registration page for Intelligent Home Security. The header is orange with the logo and navigation links: Home, DataBox, Resident Registration, Registered Residents, and About US. A user greeting "Hello Anonymous User!" is visible. The main content area is titled "Registration" and contains a form with the following fields: Name (sohrab97), Email (sohrab@gmail.com), Password (masked with dots), and Password Confirmation (masked with dots). A green "Submit" button is at the bottom left. A link "Already have an account? Login" is at the top right.

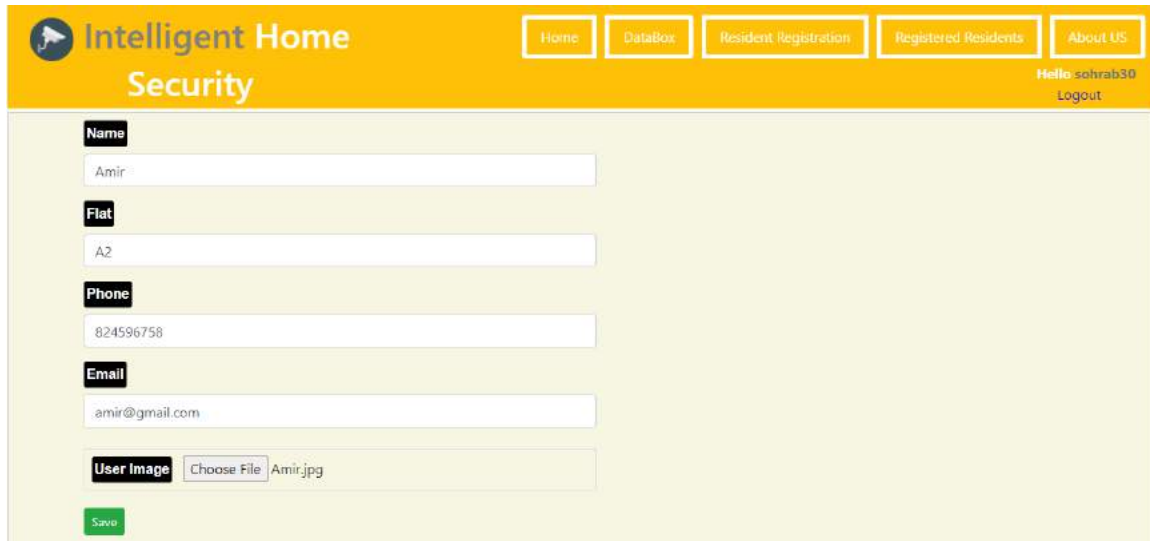
Figure 5.1.1: Sign-up Process



The screenshot shows the login page for Intelligent Home Security. The header is orange with the logo and navigation links: Home, DataBox, Resident Registration, Registered Residents, and About US. A user greeting "Hello Anonymous User!" is visible. The main content area is titled "LOGIN" and contains a form with the following fields: Username (sohrab97) and Password (masked with dots). A "Login" button is at the bottom center. A link "Don't have an account? Sign Up" is at the bottom left.

Figure 5.1.2: Login Process

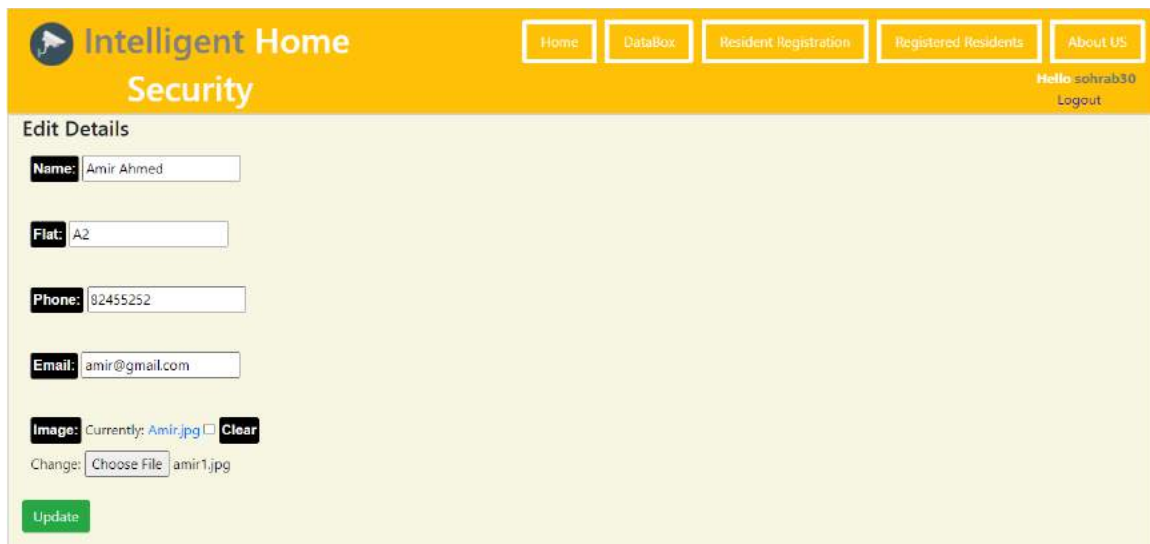
Here, in figure (5.1.3) is shown the resident registration process.



The screenshot shows the 'Resident Registration' page of the 'Intelligent Home Security' application. The page has a yellow header with the application name and logo on the left, and navigation buttons for 'Home', 'DataBox', 'Resident Registration', 'Registered Residents', and 'About US' on the right. A user is logged in as 'Hello sohrab30' with a 'Logout' link. The registration form contains the following fields: 'Name' (Amir), 'Flat' (A2), 'Phone' (824596758), 'Email' (amir@gmail.com), and 'User Image' (Amir.jpg). A 'Save' button is at the bottom left.

Figure 5.1.3: Resident Registration Process

Here, in figure (5.1.4) and (5.1.5) are shown the resident information updating process.



The screenshot shows the 'Edit Details' page of the 'Intelligent Home Security' application. The page has the same yellow header and navigation as Figure 5.1.3. The 'Edit Details' form contains the following fields: 'Name' (Amir Ahmed), 'Flat' (A2), 'Phone' (82455252), 'Email' (amir@gmail.com), and 'Image' (Currently: Amir.jpg). There is a 'Clear' button next to the image field and a 'Change' section with a 'Choose File' button and 'amir1.jpg' text. An 'Update' button is at the bottom left.

Figure 5.1.4: Resident Information Updating Process

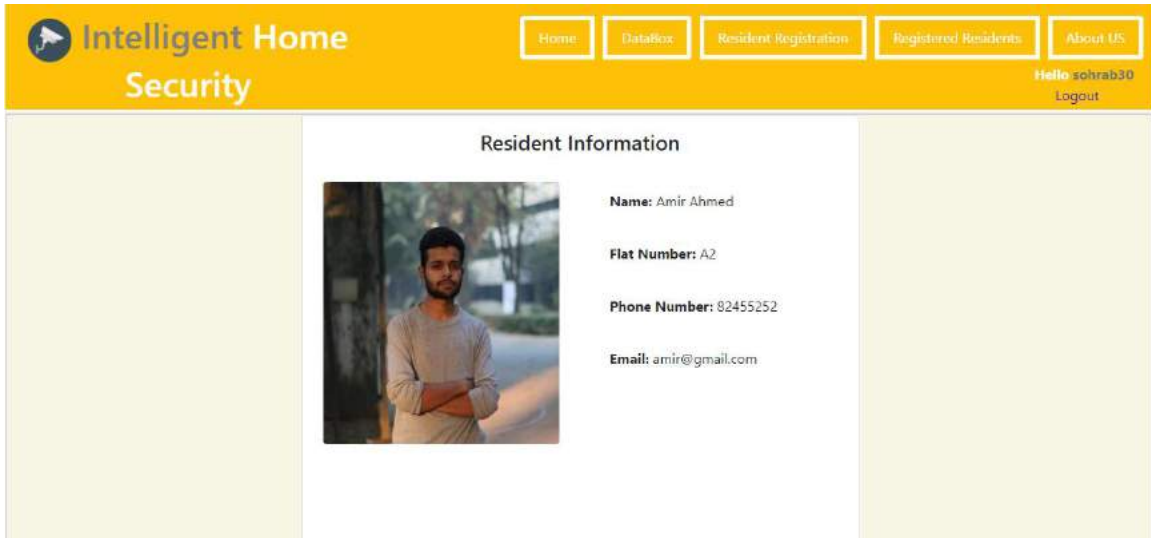


Figure 5.1.5: Resident Updated Information

Here, in figure (5.1.6) we have shown the resident information deleting process.

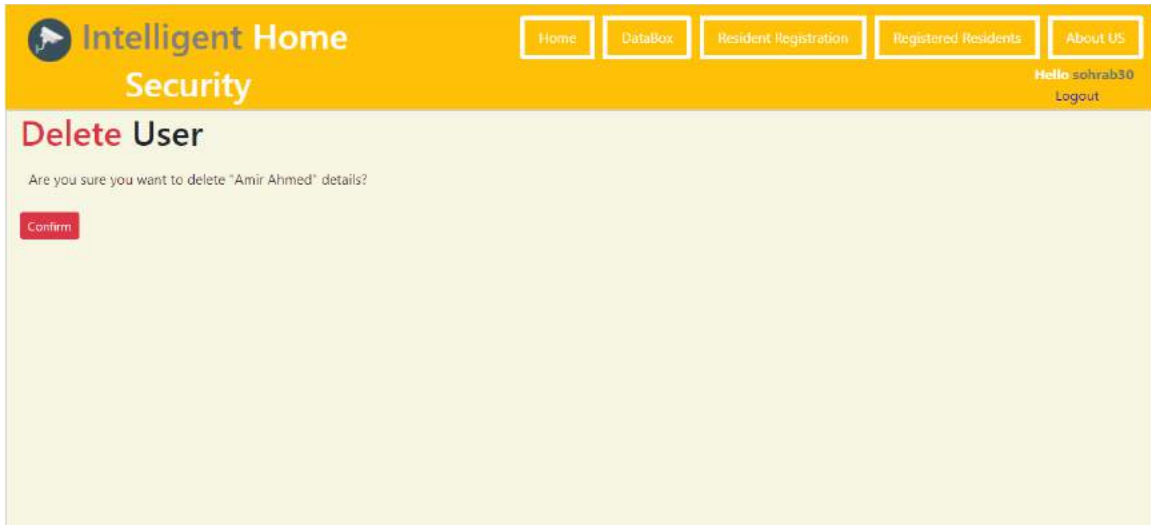


Figure 5.1.6: Resident Information deleting process

Here, in figure (5.1.7) is shown constraint message for login. For login user has to provide correct user name and password.

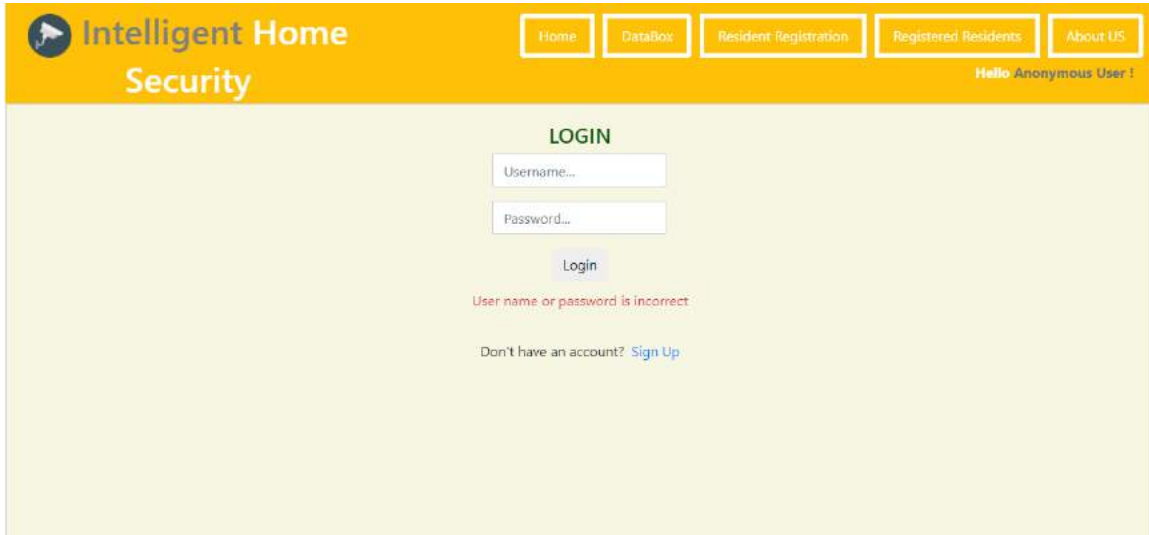


Figure 5.1.7: Constraint for Login

Here, in figure (5.1.8) is shown constraint message for resident registration. Without login, there is no permission to complete registration as a resident. Only admin can do it.

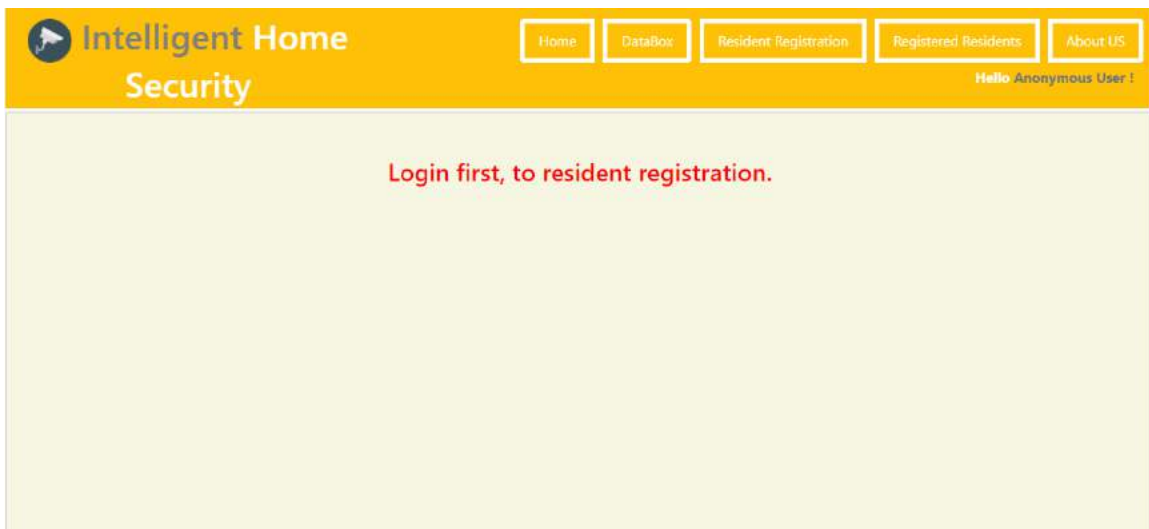


Figure 5.1.8: Constraint for Resident Registration

Here, in figure (5.1.9) is shown constraint for privacy assuring issues. Without login, nobody cannot see the resident information.

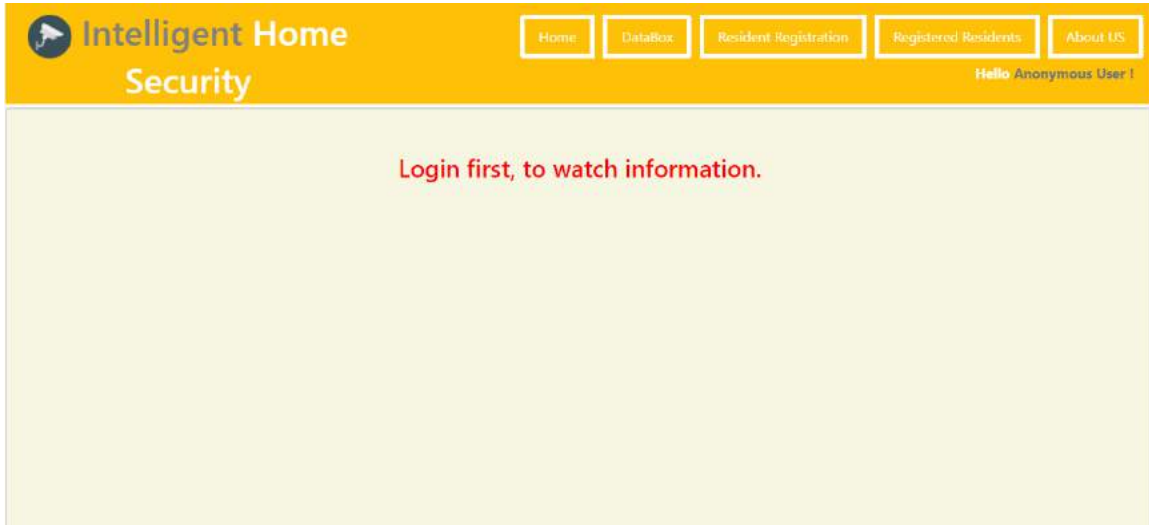
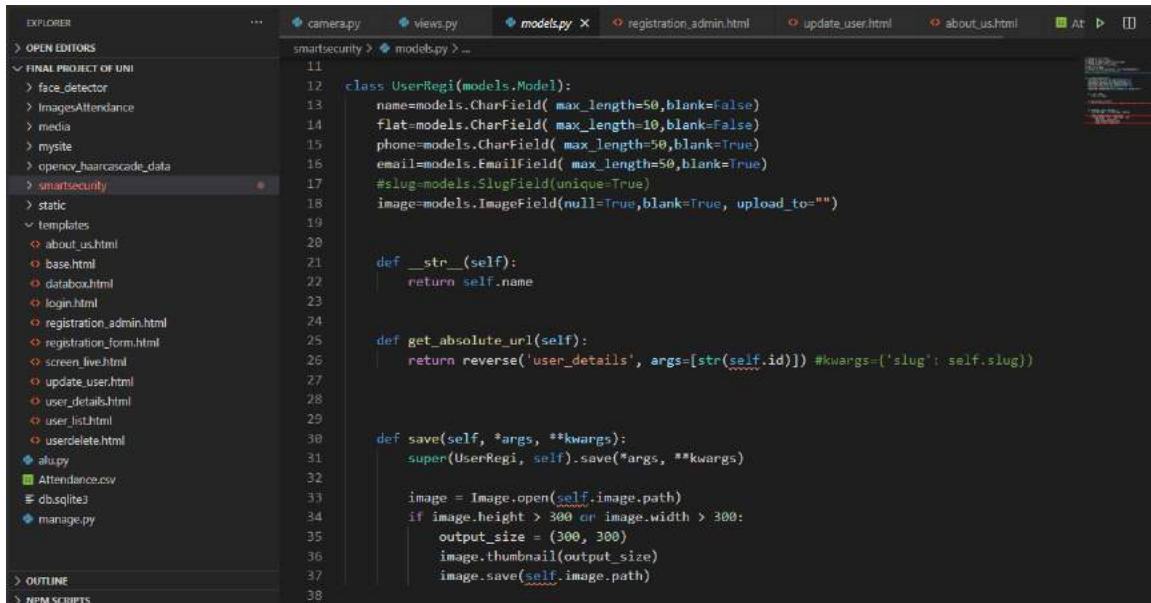


Figure 5.1.9: Constraint for Assuring Privacy

5.2 Implementation of Database

In figure (5.2.1) is shown the data model for resident's registration. We have used built-in Django model class inside "UserRegi" custom class. Using this class, information is stored in database. Here database is SQLite that is used by default with Django.



```
11
12 class UserRegi(models.Model):
13     name=models.CharField(max_length=50,blank=False)
14     flat=models.CharField(max_length=10,blank=False)
15     phone=models.CharField(max_length=50,blank=True)
16     email=models.EmailField(max_length=50,blank=True)
17     #slug=models.SlugField(unique=True)
18     image=models.ImageField(null=True,blank=True,upload_to='')
19
20
21     def __str__(self):
22         return self.name
23
24
25     def get_absolute_url(self):
26         return reverse('user_details', args=[str(self.id)]) #kwargs={'slug': self.slug}
27
28
29     def save(self, *args, **kwargs):
30         super(UserRegi, self).save(*args, **kwargs)
31
32
33         image = Image.open(self.image.path)
34         if image.height > 300 or image.width > 300:
35             output_size = (300, 300)
36             image.thumbnail(output_size)
37             image.save(self.image.path)
38
```

Figure 5.2.1: Model of Data

5.3 Testing Implementation & Result

In the testing part we have tested all the possible aspects of the application. Firstly, we have tested the face detection part. In this section we have seen that our application perfectly detects faces.

Secondly, we have to check the face recognition part. For that we have to store data in the database perfectly. Then we have to match these faces. So, we have done it nicely and our application can recognize faces precisely.

Finally, we have to track the entrance and departure time of a person and show them to the table. We have also done this part perfectly. Here we have shown the expected outcome from this application in figure (5.3.1) and (5.3.2).

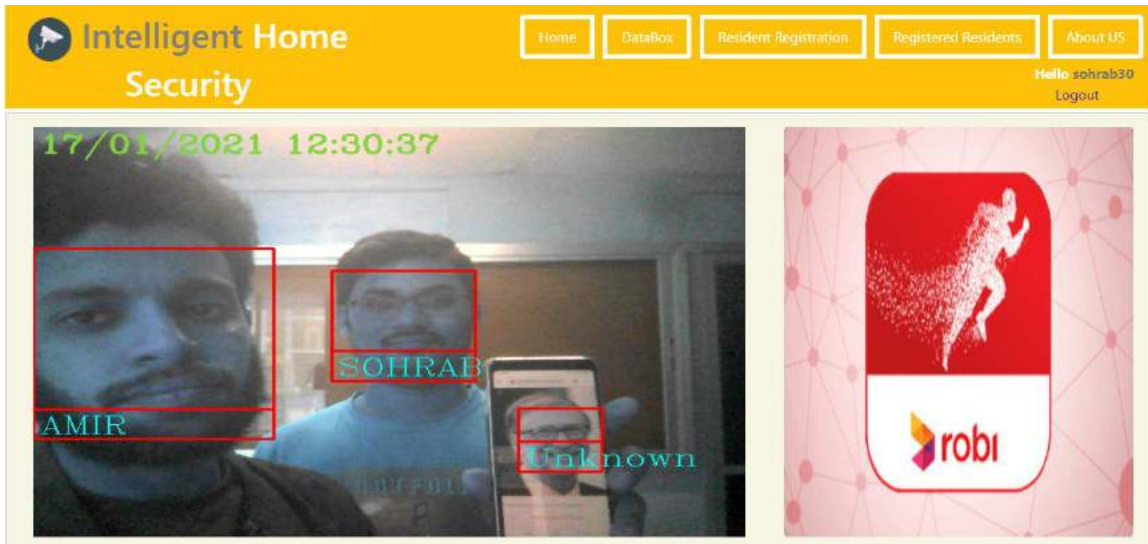


Figure 5.3.1: Live Stream

Index	Name	Date	Time	Entry	Exit
0	SOHRAB	17-01-2021	12:30:35	Yes	No
1	SOHRAB	17-01-2021	12:30:37	Yes	No
2	Unknown	17-01-2021	12:30:37	Yes	No
3	AMIR	17-01-2021	12:30:37	Yes	No
4	SOHRAB	17-01-2021	12:30:42	Yes	No
5	Unknown	17-01-2021	12:30:42	Yes	No
6	AMIR	17-01-2021	12:30:42	Yes	No
7	SOHRAB	17-01-2021	12:30:46	Yes	No
8	AMIR	17-01-2021	12:30:46	Yes	No
9	SOHRAB	17-01-2021	12:30:49	Yes	No

Figure 5.3.2: Expected Result

CHAPTER 6

IMPACT on SOCIETY & SUSTAINABILITY

6.1 Impact on Society

Most people will think that what will be the impact of an “Intelligent Home Security System” on our society. We want to explain its impact for those people who are concerned.

- We know security is the main issue in our life. We want to live our life securely but few people have in our society they destroy our peace. We pass our maximum time at home. In the town most of the people living in the building have separate flats. It is not possible to know about every person. For that we use security cameras to record their movement. But a security camera can not recognize a person. So, we need to track person behavior in the entrance and outgoing gate of the house. We can easily find suspicious cases.
- We know there are so many militant incidents happening in different places. If it would be possible observe their behavior. Authority of the house could take necessary action before happening.
- This application will provide more security features, so it will increase efficiency and save time for searching a specific clip of a video footage. As a result, the crime rate will also decrease, because many crimes happen for lack of security.
- We know lack of security increases unexpected incident’s possibility and also attracts robber, thief etc. So advanced and smart security systems will decrease these incident’s possibilities.

6.2 Ethical Access

Ethics is the set of moral principles that governs the person's behavior or the conducting of an activity. Firstly, ethics refers to well-founded standards of right and wrong that prescribe what humans ought to do. Secondly, ethics refers to the study and development of one's ethical standards.

In this application will be stored personal data of a person. So, privacy has to be assured. But for maintaining security these data have to be provided by users. Since, this project is ethically right and when the application will be used by users, the ethical acts will not be violated at any condition.

6.3 Sustainability Plan

Sustainability means the ability to survive for a long time. So, consumers buy products depending on their demand. Then they want to be assured about sustainability. Otherwise they will not invest money.

There are so many applications in the market related to this sector. But most of them are hardware based and these applications cannot bring these kinds of packages of solutions that already we have explained. We know technology is updating day by day. So, we are committed to our user that we will continue our update. So, they will get better service from our application.

CHAPTER 7

CONCLUSION & FUTURE SCOPE

7.1 Conclusion

The project Intelligent Home Security System has completed with a website with help of python, HTML, CSS, Bootstrap, Django, Face-recognition python package, dlib package, localhost, Images and many more. We hope if the government or private agency improves and implements this application, it will provide Bangladesh a smart security system at a very low cost.

7.2 Future Scope

In future we can add more detection and recognition features though it needs powerful CPU and good optimization. Such as object detection, age detection, sex detection, activity detection etc. feature can be added to increase this applications functionality. It is also possible to add a security alarm bell when it will recognize an unknown person. Since it's a web application. So, we wish to add multi-user accessibility by creating accounts on our site. As a result, people do not need to buy whole software. They can easily connect their security camera from home by user interface with permission code. So, they can save money as well as get relief from maintenance hassle of software. That will help us to go closer to the user and spread our security system all over the place.

References

- [1], Miloš Oravec, Face Recognition, Slovak University of Technology in Bratislava, Slovakia, (April 1st , 2010) Available: <https://www.intechopen.com/books/face-recognition> [Accessed 6th January 2021].
- [2], pypi.org, “Concept: face-recognition”, pypi.org, (Feb 20, 2020) Available: <https://pypi.org/project/face-recognition/> [Accessed 6th January 2021].
- [3], Ankush Thakur “Concept: face-recognition”, geekflare.com, (June 16, 2019) Available: <https://geekflare.com/facial-recognition-for-business/> [Accessed 6th January 2021].
- [4], researchgate.net and “Concept: Use-case Model”, researchgate.net, (May 2014) Available:https://www.researchgate.net/figure/CPU-Mono-Face-Recognition_fig1_271156813 [Accessed 6th January 2021].
- [5], cnet.com, “Concept: face-recognition camera”, cnet.com, Available: <https://www.cnet.com/news/best-facial-recognition-security-cameras-of-2021> [Accessed 6th January 2021].
- [6], electronicid.eu, “Concept: Facial Biometrics”, (Jul 27, 2020),electronicid.eu, Available: <https://www.electronicid.eu/en/blog/post/face-recognition> [Accessed 6th January 2021].

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