Smart Underage Driver Detector

Group Members

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Project Supervisor

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Problem Statement:

Current age detection systems struggle to accurately identify underage drivers, and there are no automatic detectors or suitable datasets available, highlighting the need for improvements to enhance safety and regulation enforcement.

Solution:

Creating accurate automatic age detection systems and comprehensive driver image datasets can significantly enhance road safety and enforce driving regulations.

Purpose:

Enhance road safety by preventing underage driving through advanced age and object detection technology, fostering innovation and safer communities.

Fine Tuning

Data gathering and collection protocols:

- Data is consist of 800-1000 images of drivers age from 8 years to 40 years old
- Images are taken outside the car, windscreen should be visible in image

Fine Tuning

Data gathering and collection protocols:

- Images will be collected from 3 different angle and positions

Angles(Front,left,right)

Fine Tuning

Data gathering and collection protocols:

- Images will be collected from 3 different angle and positions

Distance(2,4 and 6 meters)

Fine Tuning

Data gathering and collection protocols:

- Images should be taken in Morning and Evening

Fine Tuning

Date pre-processing:

- Given images a proper format for fine tuning

Issues:

- Lack of computation and financial resources
- Driver side detection issue
- Result Accuracy of captured image or video

Solution:

- Using lightweight models, reducing input data size, and leveraging batch processing to manage resource limitations.
- Using Yolov3 for face detection and then select the leftmost face(driver side)
- extract the face of driver and then pass to the trained model for better precision

Project Methodologies

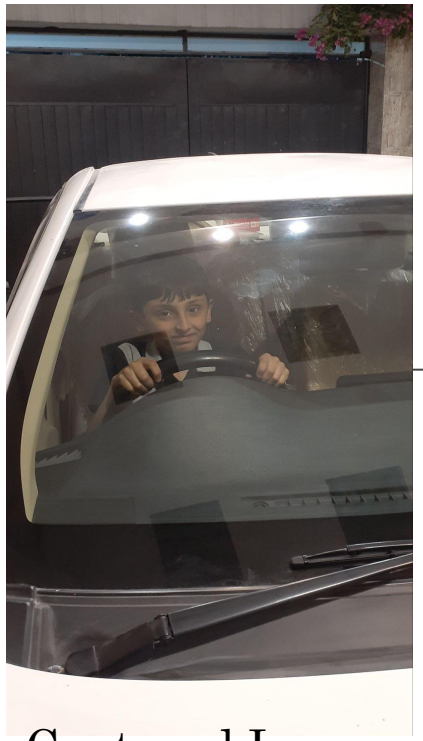
1. **Version Control**
   - Github

2. **Naming Convention**

Element	Convention
Variables. Function, Methods	snake_case
Constants	Uppercase_snake_case
Classes	snake_case
Testing	snake_case

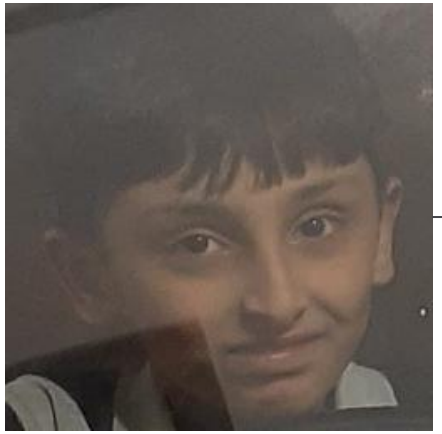
Pipeline of Implementation

Detecting, Extracting face and Result



Captured Image

Yolov3



Extracted Face

CNN model

Output Result

What about this???

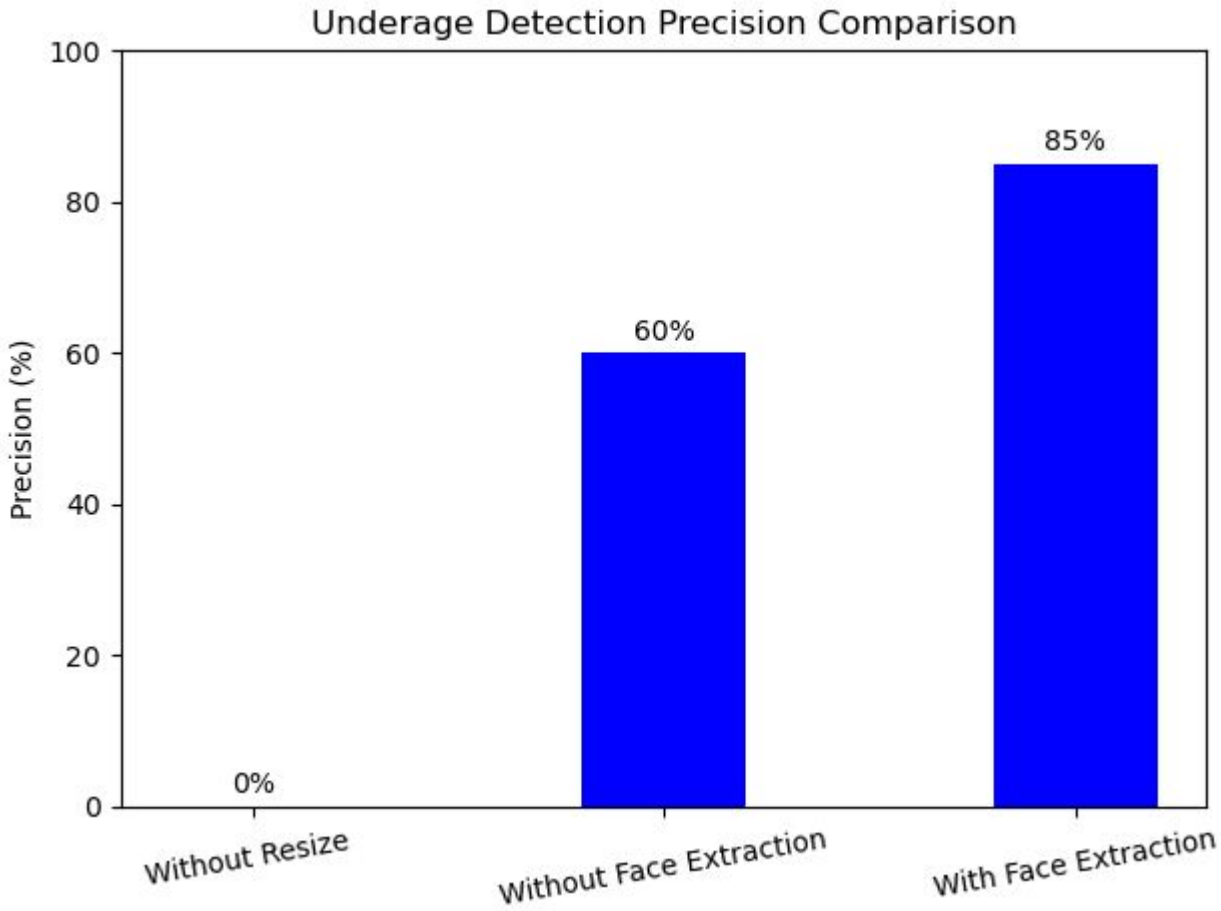
Proposed Solution

Input Images

Yolov3

Select the Left most Detected Face

Train Model Evaluation



Testing

```python
def test_home_route(client):
    """Test that the home page loads correctly and contains the expected content."""
    response = client.get('/')  # Send a GET request to the home page
    assert response.status_code == 200
    assert b'Smart Underage Driver Detector System' in response.data
    assert b'Signup' in response.data
    assert b'Login' in response.data
```

```python
def test_signup_route(client):
    """Test that the signup page loads correctly and contains the expected content."""
    response = client.get('/signup')
    assert response.status_code == 200
    assert b'Create an account' in response.data
    assert b'Name' in response.data
    assert b'Email' in response.data
    assert b'Phone' in response.data
    assert b'Password' in response.data
    assert b'Sign up' in response.data
    assert b'Already have an account?' in response.data
```

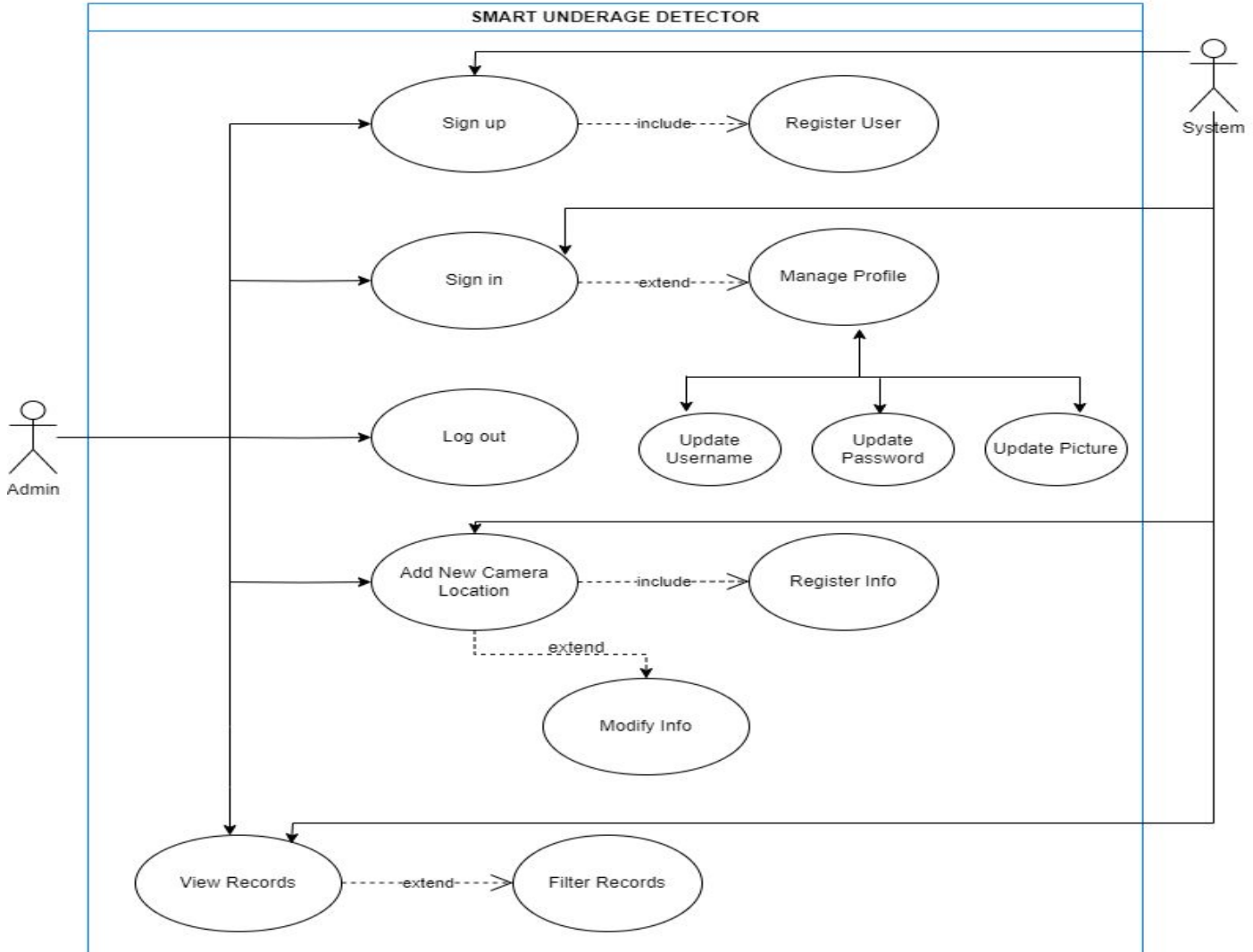
```python
def test_login_route(client):
    """Test that the login page loads correctly and contains the expected content."""
    response = client.get('/login')
    assert response.status_code == 200
    assert b'Log in' in response.data
    assert b'Email' in response.data
    assert b'Password' in response.data
    assert b'Log in' in response.data
    assert b"Don't have an account?" in response.data
```

Testing

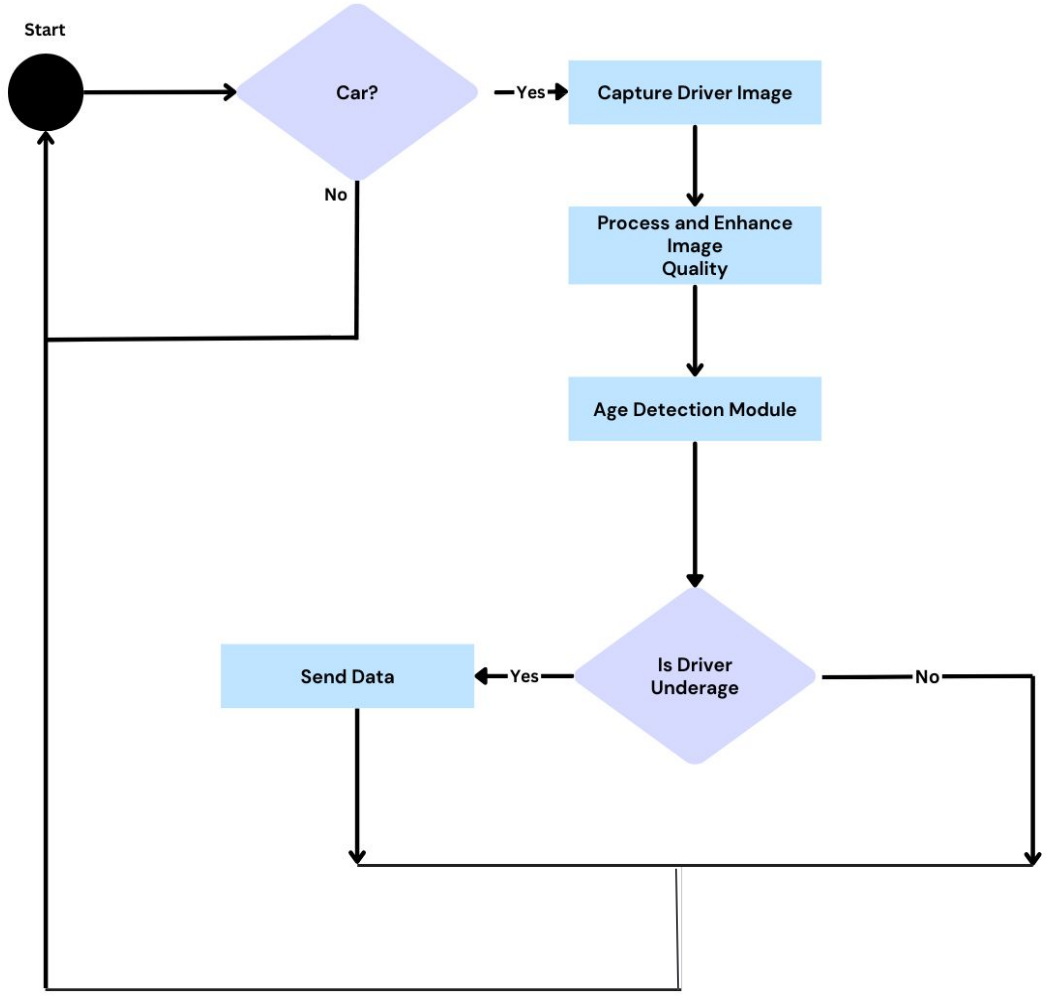
```
============================================================ 2 passed in 1.62s ============================================================
(my_venv) PS C:\Users\moeez\OneDrive\Desktop\FYP-Smart-Underage-Driver-Detector-master> python -m pytest
>>
============================================================ test session starts ============================================================
platform win32 -- Python 3.13.0, pytest-8.3.3, pluggy-1.5.0
rootdir: C:\Users\moeez\OneDrive\Desktop\FYP-Smart-Underage-Driver-Detector-master
collected 3 items

test_home_route.py .                                                                                                              [ 33%]
test_login_route.py .                                                                                                             [ 66%]
test_signup_route.py .                                                                                                            [100%]

============================================================ 3 passed in 2.30s ============================================================
(my_venv) PS C:\Users\moeez\OneDrive\Desktop\FYP-Smart-Underage-Driver-Detector-master>
```

WEBSITE DEMO

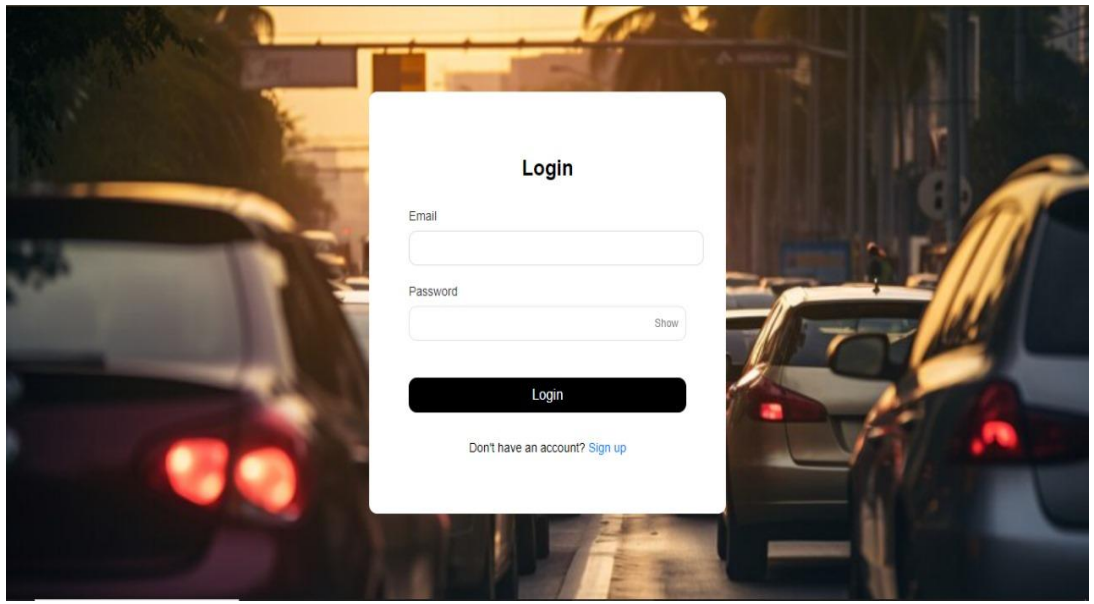
Use Case Diagram

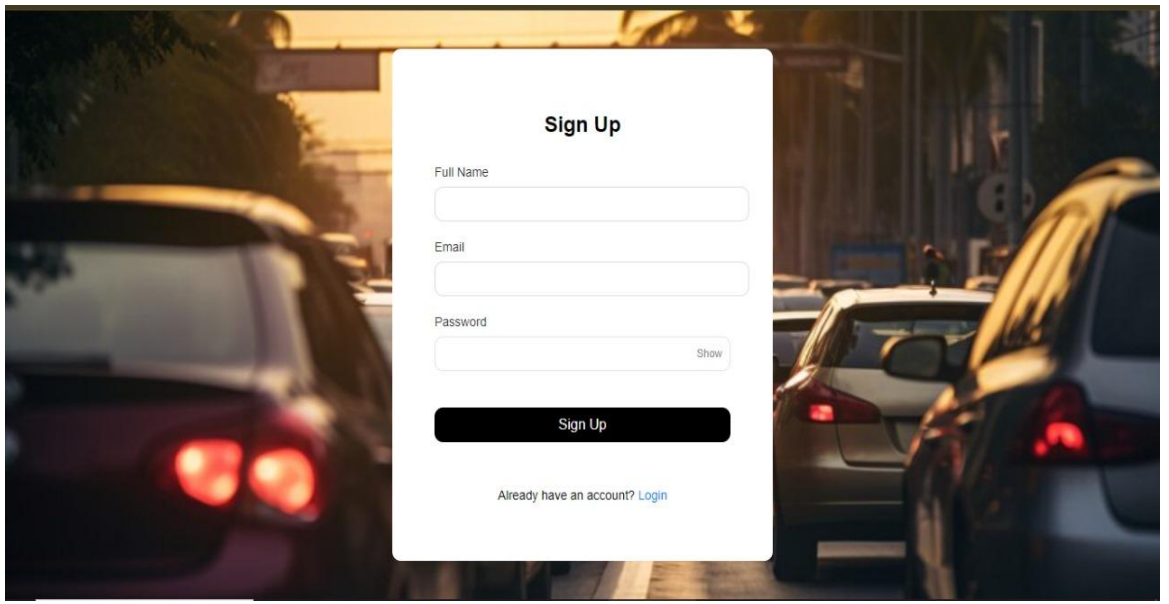


DATA FLOW DIAGRAM

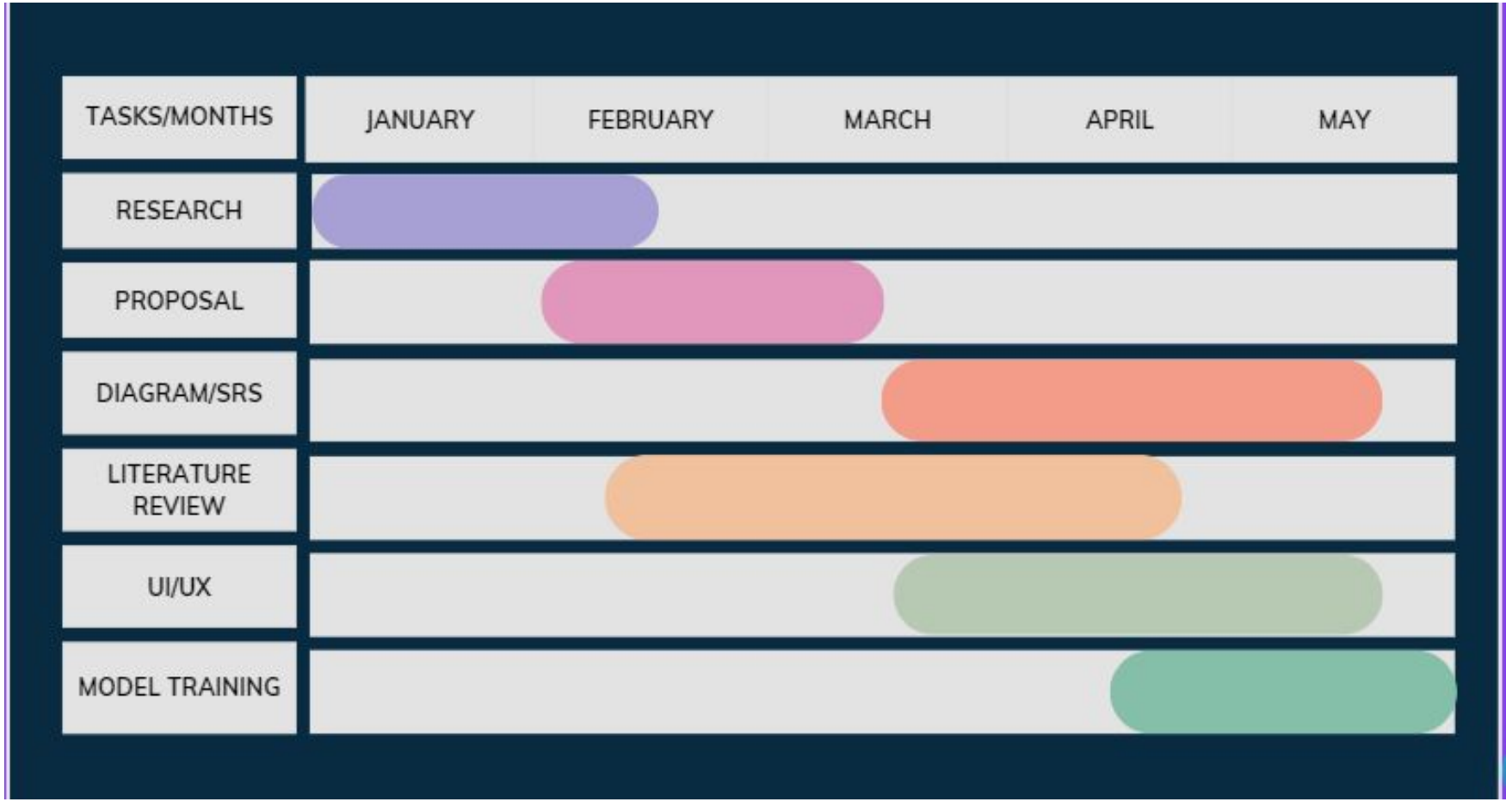


UI SCREEN


Login
Email
Password
Show
Login
Don't have an account? Sign up


Sign Up
Full Name
Email
Password
Show
Sign Up
Already have an account? Login

FYP 1 Gantt Chart



Team Work

	Project Implementation	**Proposal Presentation**
Ramzan Ali	Research, Backend Developer, Proposal Development,Database Developer, Modeling And Documentation	Brainstorming, Presentation ,Gantt Chart and script Formulation
Syed Ali Hasnain	Research, Proposal Development,Backend developer, Module Integration, Modeling,Tester	Brainstorming,Gantt Chart, and script Formulation
Muhammad Shaheer	Research,Proposal Development and Formatting, Frontend, Documentation	Brainstorming, Slides and script Formulation

Thank You !