

## **TEST SPECIFICATION**

### **1.0 Introduction**

Software testing is a process, to evaluate the functionality of a software application with an intent to find whether the developed software met the specified requirements or not and to identify the defects to ensure that the product is defect-free in order to produce a quality product. It can be done either manually or by using automated tools. We are going to do unit testing, Functional and Non-Functional testing to deliver qualitative product.

#### ***1.1 Goals and objectives***

- To deliver high qualitative software for drowsy detection of driver. High quality product typically has fewer defects and requires less maintenance which in turn leads to reduced costs.
- To verify whether all specified requirements are fulfilled.
- To validate whether developed software or product works as stakeholders expectations.
- To identify defects and do rigorous testing to prevent defects which helps in delivering error-free application to stakeholders.

#### ***1.2 Statement of scope***

For our test scope, we have a step-by-step approach in testing all our requirements mentioned. We have developed a testing a schedule along with different test cases that support our scope in having successful track of the Software testing.

In this Software testing scope we will list our various features such as eye detection, facial landmarking, whether an user is wearing glasses, background detection of the user, no multiple users can access the real-time surveillance frame at the same time.

Nonfunctional testing such as stress, performance or logical database currently will not be tested. At last, the entire system is tested through system testing for the alert while the driver is drowsy/distracted.

### **2.0 Test Plan**

Main aim of this project is to detect drowsiness and distraction of driver.

Different modules of the project like the face detection, eye detection, drowsiness detection and distraction detection are all tested under unit and functional testing. After detecting the face, check if the system is able to extract required features of the face or not through functional testing. Functionality testing is done on the website being developed to test each

and every feature on website, for example if a user does not fill a mandatory field in a form an error message is shown.

Suspension criteria for this project is 50%,that means if 50% of test cases fails testing cycle is suspended and development team will make required changes in code and then testing is resumed again. Exit criteria is 95% of test cases should be successful.

### **2.1 Software to be tested**

The software to be tested is our Real-Time Surveillance Computer Vision based software. Which integrates with our webpage using html that includes a small graphic user interface (GUI) that will enable users to interact and test the drowsiness detection from our software.

### **2.2 Testing tools and environment**

The system resources and the test environment comprised of the Windows 10 PC run under an intel core i5 processor and 8GB RAM with a 1TB HDD.The entire project is run and tested under PyCharm IDE with an attached Webcam.

### **2.2 Test schedule**

Various testcases for testing different modules of the system under different conditions have been identified.

Two testcases have been performed till now.

In future all testcases will be tested and results are logged in and report the outcomes along with defects.

<b>Task Name</b>	<b>Task Description</b>	<b>Start Date</b>	<b>End Date</b>	<b>Estimated Efforts</b>	<b>Notes</b>
Eye Detection	Detection Of Eye	10-12-2022	10-19-2022	5Hrs/Week	Success
Region Of Interest	Identify 68 Facial Points	10-23-2022	10-30-2022	6Hrs/Week	Success
Wait time	To identify	11-01-2022	11-5-2022	4Hrs/5days	Success
Person Wearing Glasses	To detect drowsiness of person wearing spectacles	11-07-2022	11-11-2022	5HRS/5 days	Success
Background Detection	To make sure background persons face should not be detected.	11-12-2022	11-15-2022	5HRS/4 days	Success
Position of driver face-center	To check whether system detecting faces positioned center towards	11-17-2022	11-20-2022	2Hrs/3 days	Success

	camera				
Position Of Driver Face-Right	To detect person face positioned towards right side of camera	11-17-2022	11-20-2022	1Hr/3days	Success
System Alert	To send an alert message if driver is drowsy	11-17-2022	11-20-2022	4Hrs/3days	Success

Min value	EAR	To check whether drowsiness is detected if EAR<min threshold	11-27-2022	11-27-2022	1Hr/day	Success
Max value	EAR	To check that person is awake if EAR value>Max threshold	11-27-2022	11-27-2022	1Hr/day	Success
Website Testing		To test UI,Links,buttons working properly or not.	11-28-2022	11-29-2022	3Hrs/2 days	Success

\*\*\*\*This Table will be updated with every Test Case version in every Phase.

Test Case	TC-1
Name of the test	Eye Detection
Item Tested	Eye
Sample Input	User's Face
Expected Output	Detection of Eye
Actual Output	Same as Expected Output
Remarks	Success

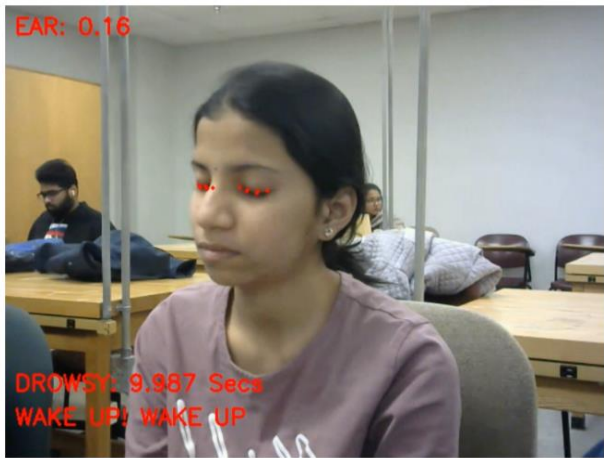


Test Case	TC-2
Name of the test	Region Of Interest
Item Tested	Face
Sample Input	User's Face
Expected Output	Detection of 68 Facial Points
Actual Output	Same as Expected Output
Remarks	Success



Test Case	TC-3
Name of the test	Wait Time
Item Tested	Face
Sample Input	User's Face
Expected Output	To check how much time it is taking to pop up alert message if driver is drowsy.
Actual Output	Same as Expected Output.
Remarks	Success

## Drowsiness Detection!!! 🤪



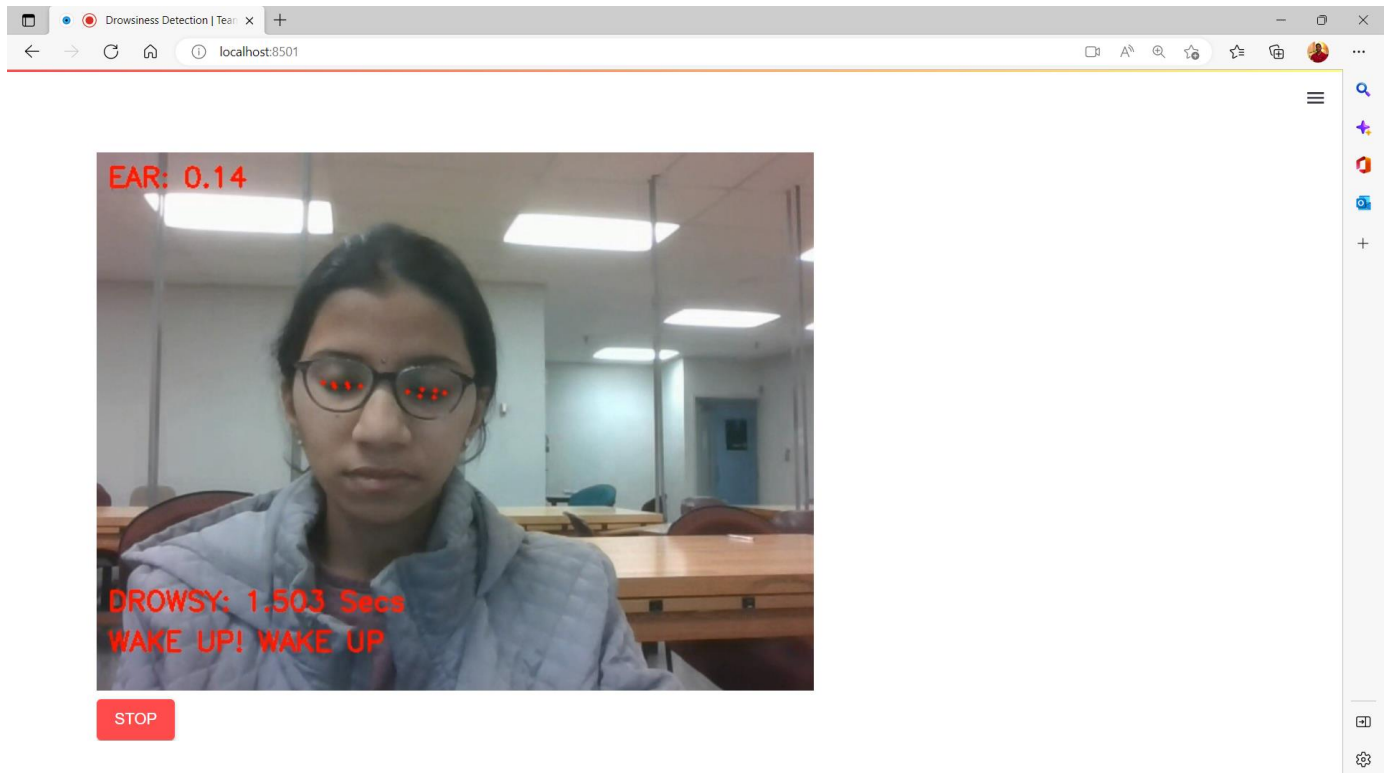
Seconds to wait before sounding alarm:



Eye Aspect Ratio threshold:



Test Case	TC-4
Name of the test	Person wearing glass
Item Tested	Face
Sample Input	User's Face wearing spectacles
Expected Output	Detect if person is drowsy or not
Actual Output	Same as Expected Output
Remarks	Success



Test Case	TC-5
Name of the test	Background Detection
Item Tested	Face
Sample Input	User's Face with background image/person
Expected Output	Primary person should be detected and person or image in background should not be detected
Actual Output	Same as Expected Output
Remarks	Success

## Drowsiness Detection!!! 🤪



Seconds to wait before sounding alarm:



Eye Aspect Ratio threshold:





Test Case	TC-6
Name of the test	Driver Face positioned at center
Item Tested	Face
Sample Input	User's Face positioned center towards camera
Expected Output	To detect if a person is drowsy or not
Actual Output	Same as Expected Output
Remarks	Success

## Drowsiness Detection!!! 🤪



STOP

Seconds to wait before sounding alarm:

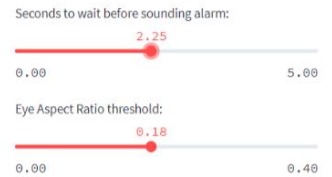
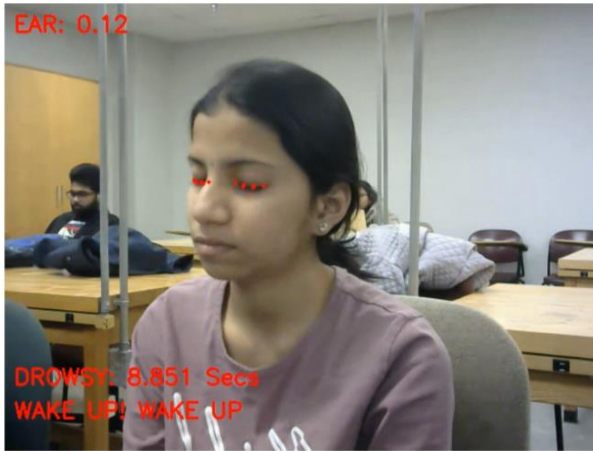


Eye Aspect Ratio threshold:



Test Case	TC-7
Name of the test	Driver Face positioned at Right
Item Tested	Face
Sample Input	User's Face positioned right towards camera
Expected Output	To detect if a person is drowsy or not
Actual Output	Same as Expected Output
Remarks	Success

## Drowsiness Detection!!! 🤖



Test Case	TC-8
Name of the test	System Alert
Item Tested	Alarm
Sample Input	Users face in drowsy condition
Expected Output	To pop up alert message, alarm if driver is drowsy.
Actual Output	Same as Expected Output
Remarks	Success

## Drowsiness Detection!!! 🤪



Seconds to wait before sounding alarm:



Eye Aspect Ratio threshold:



Test Case	TC-9
Name of the test	Min EAR value
Item Tested	Eye
Sample Input	User's Face
Expected Output	To detect if a person is drowsy or not based on EAR value
Actual Output	Same as Expected Output
Remarks	Success

## Drowsiness Detection!!! 😞



STOP

Seconds to wait before sounding alarm:



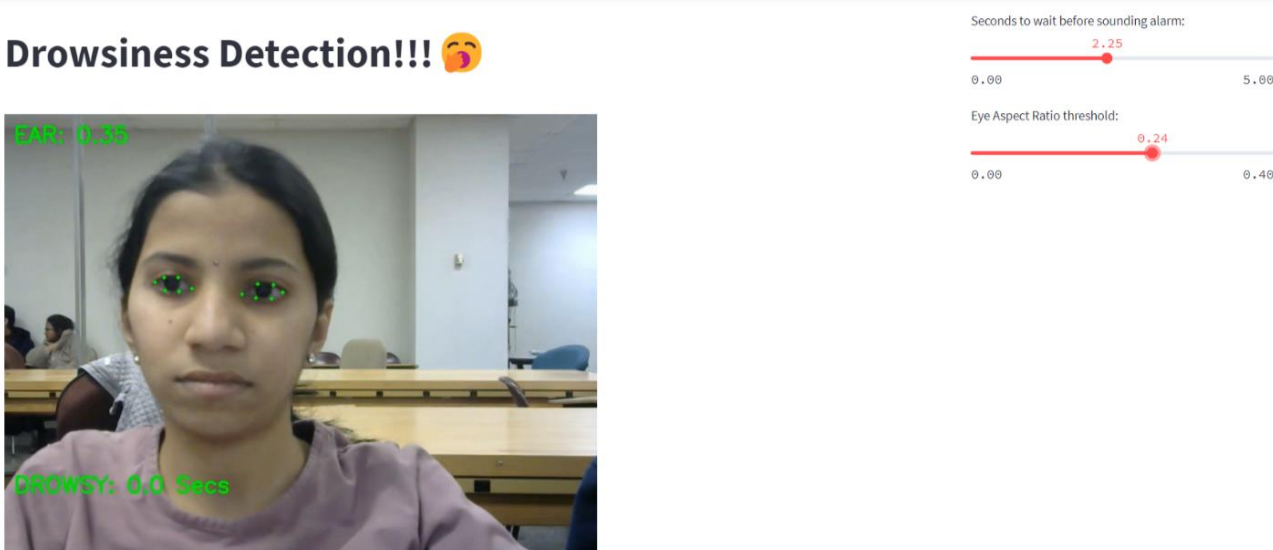
Eye Aspect Ratio threshold:



EAR values can be arranged manually. Here min EAR value is  $0.09 < 0.24$ , so the person is drowsy.

Test Case	TC-10
Name of the test	MAX EAR value
Item Tested	Face
Sample Input	User's Face
Expected Output	To detect if a person is drowsy or not
Actual Output	Same as Expected Output
Remarks	Success

## Drowsiness Detection!!! 🤪



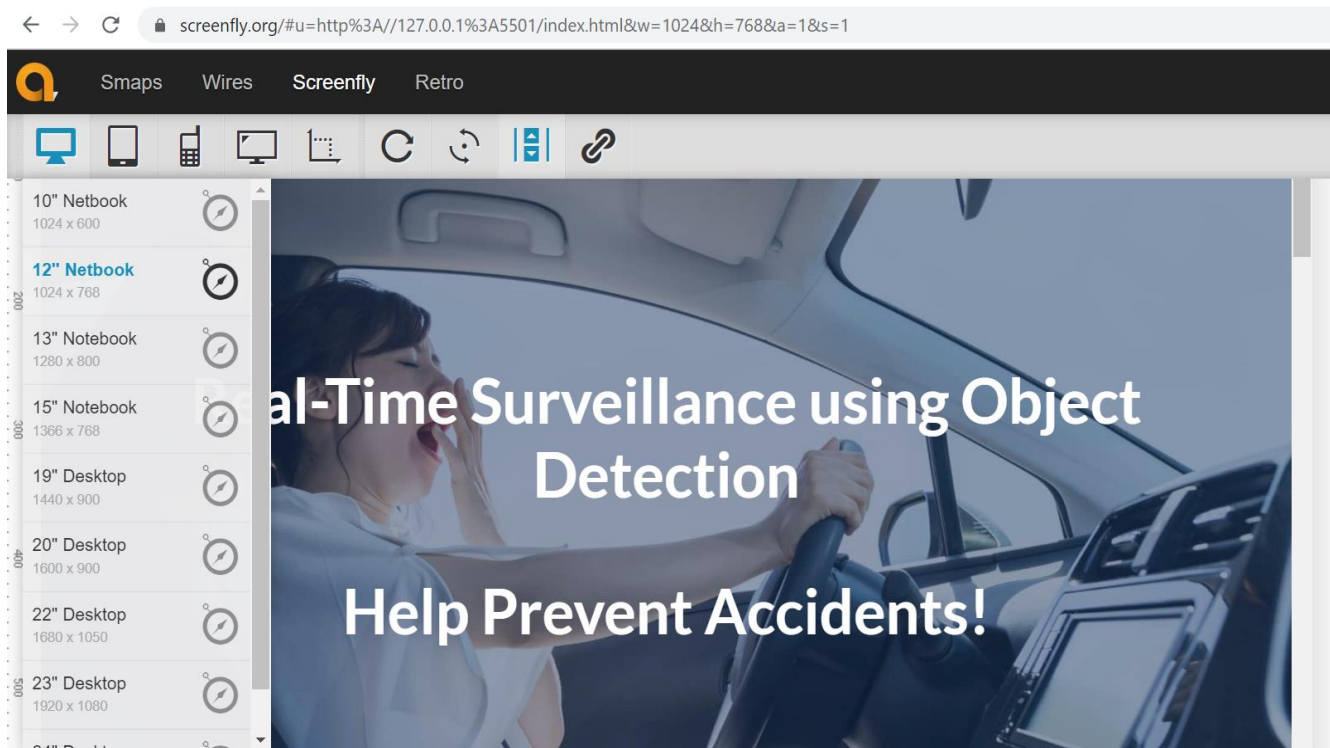
Seconds to wait before sounding alarm:  
 0.00 — 2.25 — 5.00

Eye Aspect Ratio threshold:  
 0.00 — 0.24 — 0.40

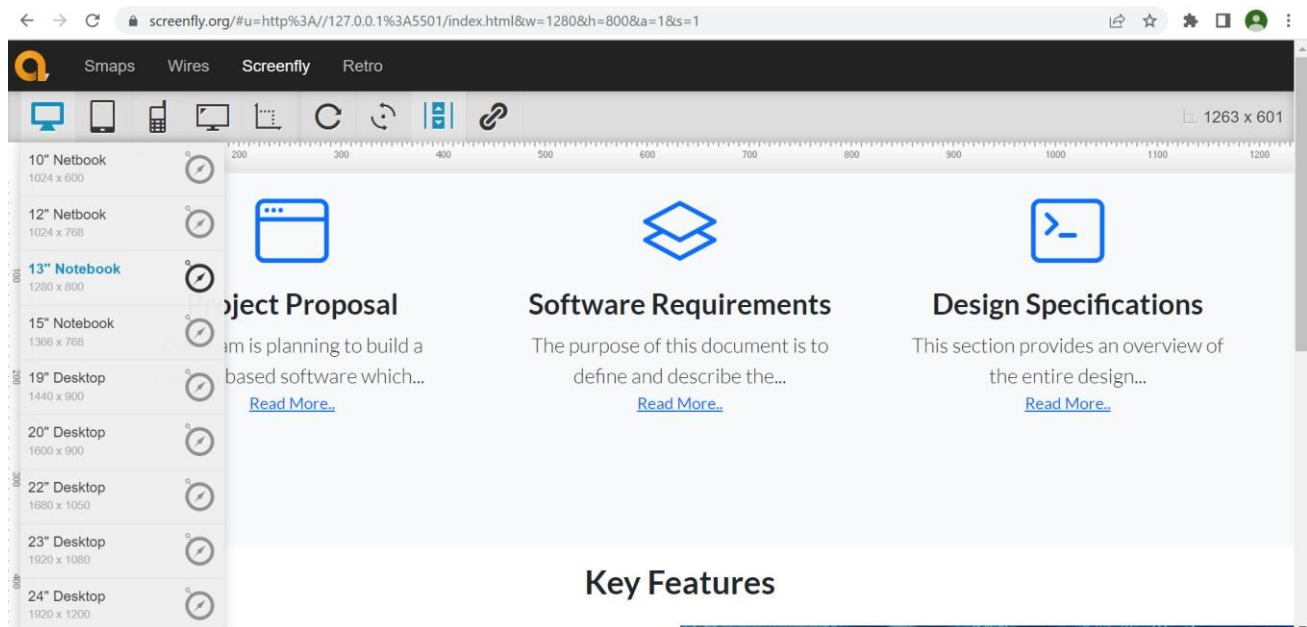
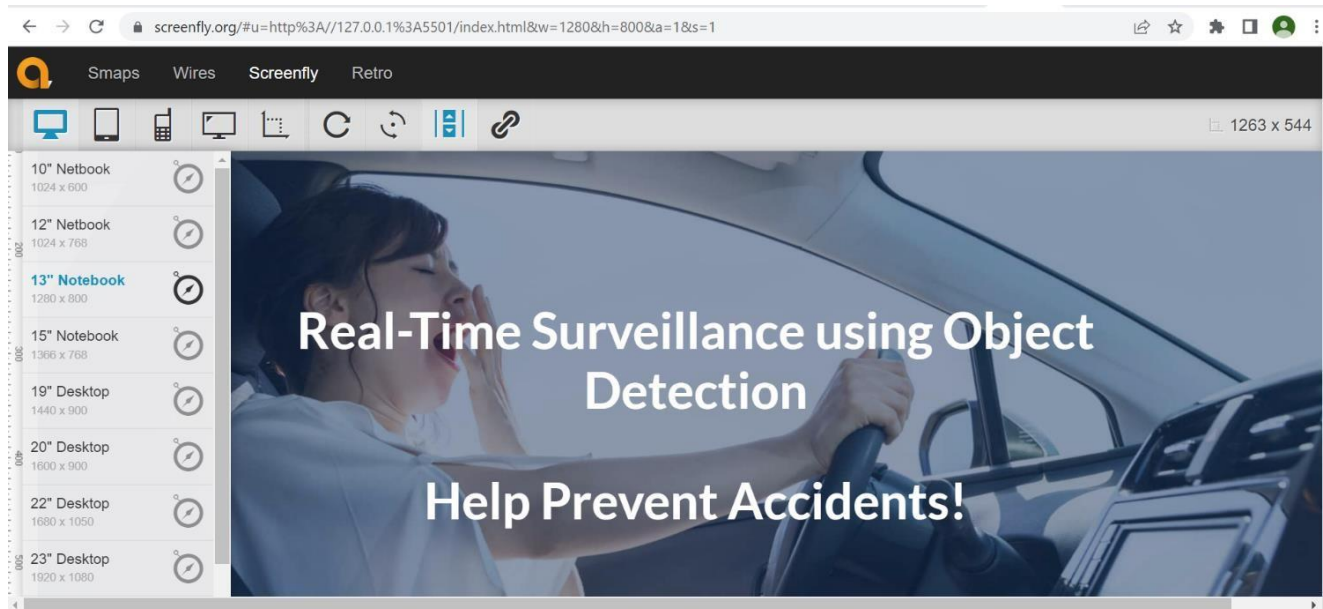
EAR value > min threshold (0.24) so the person is awake.

Test Case	Web NFTC-1
Name of the test	Screen Resolutions of webpage
Item Tested	Webpage
Sample Input	Webpage URL
Expected Output	Should work correctly in different resolutions.
Actual Output	Same as Expected Output
Remarks	Success.

**a) Webpage at 1024\*768 Resolution:**

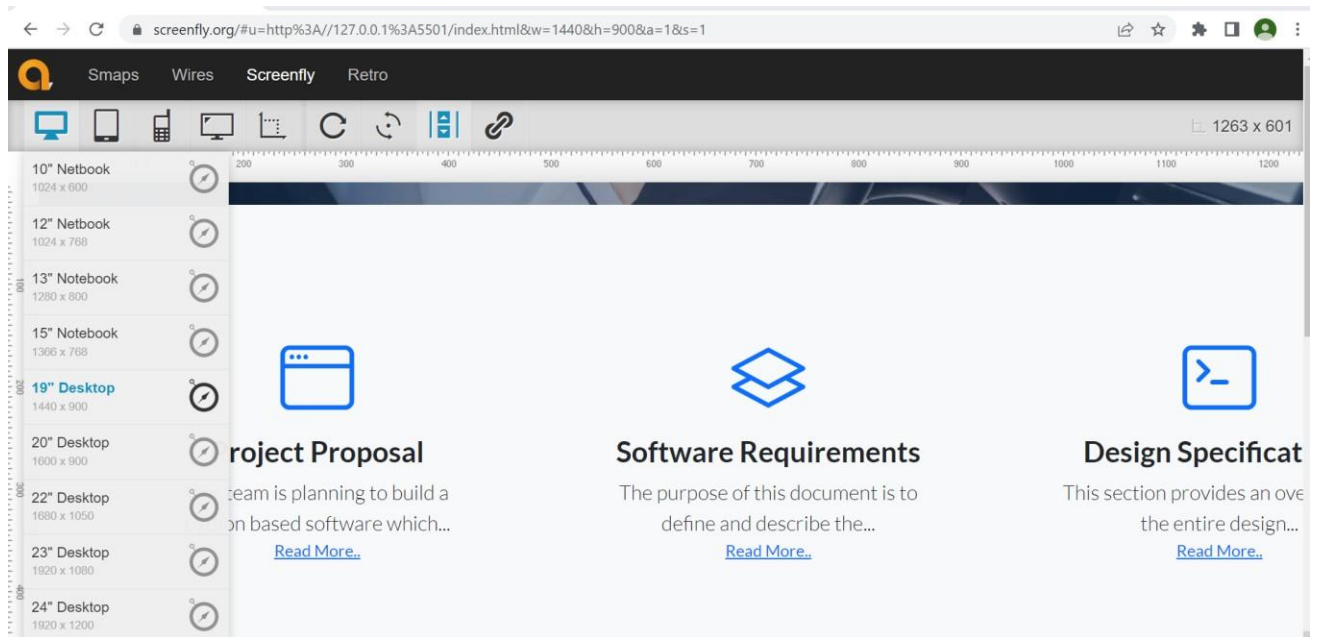
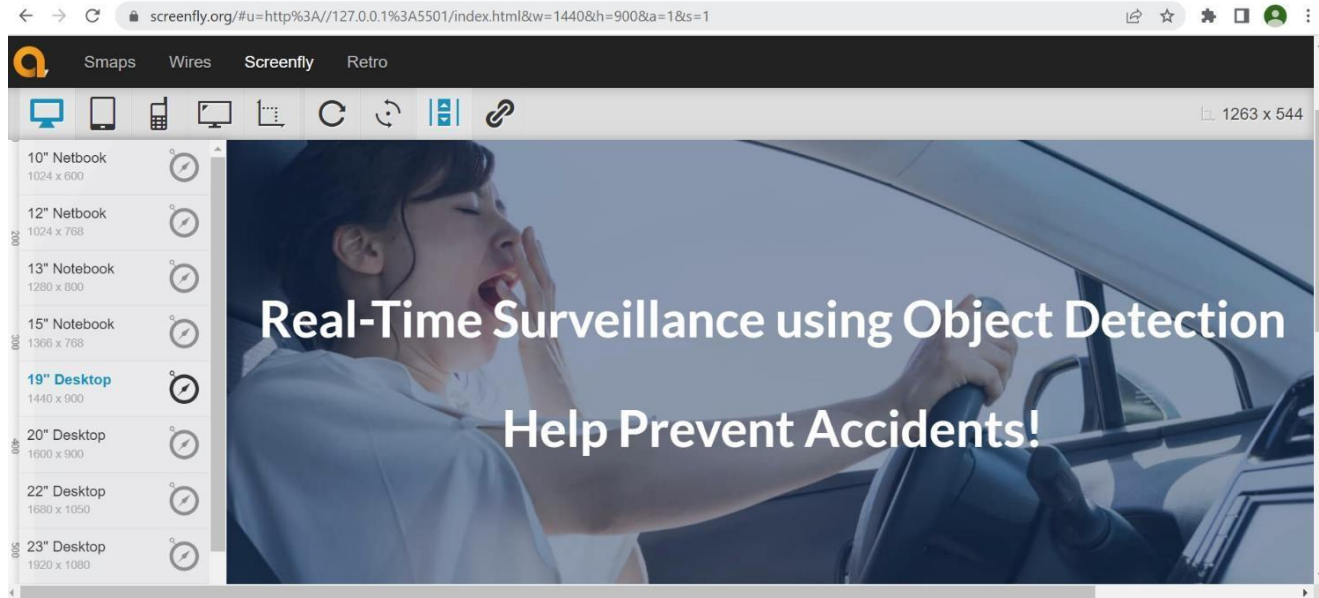


## b) Webpages at 1280\*800 Resolution:



## c) Webpages at 1440\*900 Resolution

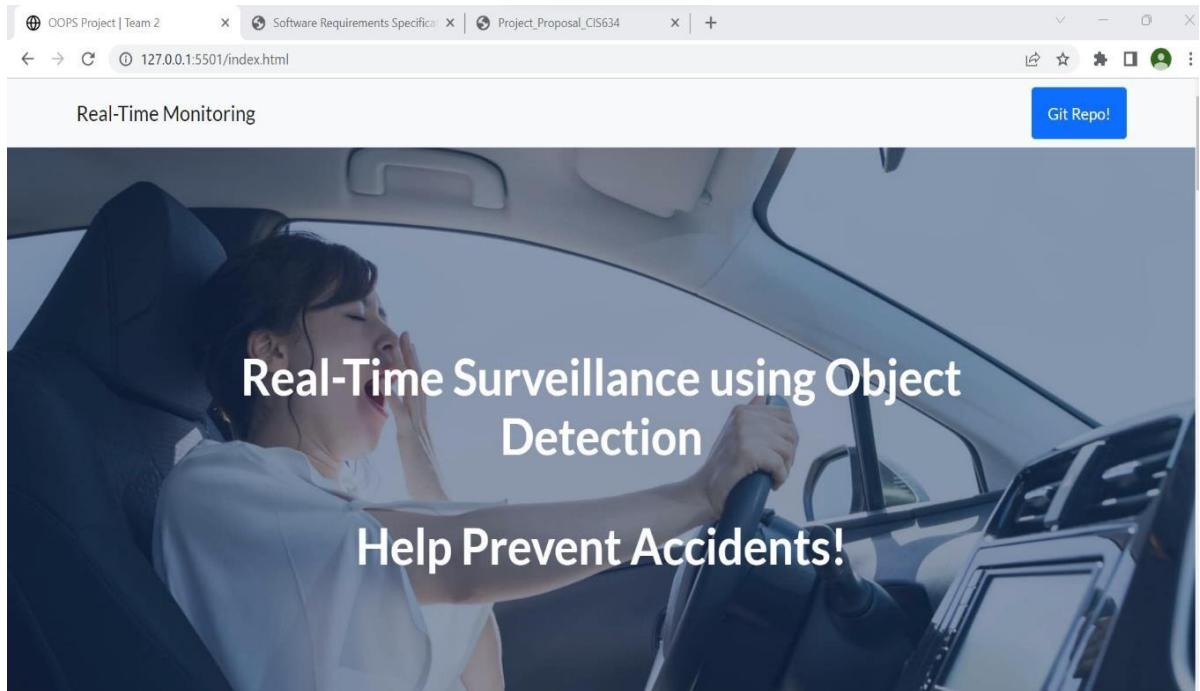




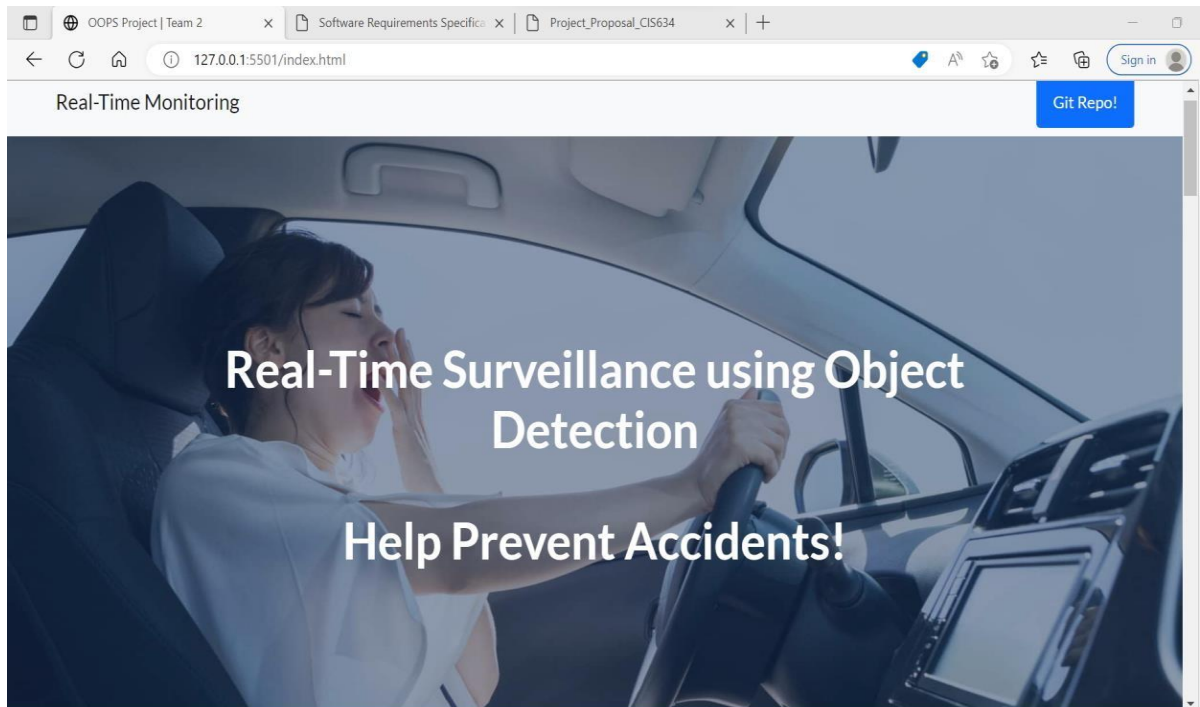
Test Case	Web NFTC-2
Name of the test	Browser Compatibility of webpage
Item Tested	Webpage
Sample Input	Webpage URL
Expected Output	Webpage can be accessible in different browsers.
Actual Output	Same as Expected Output
Remarks	Success

### A. Webpage in "Yahoo"

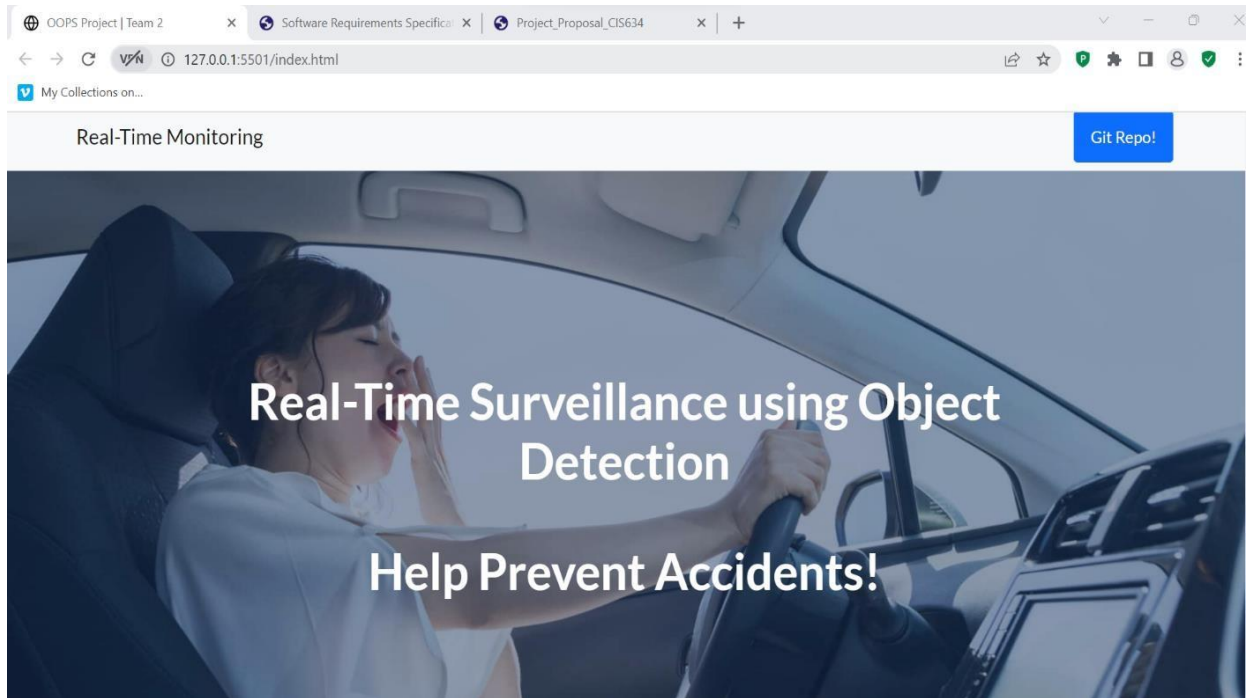




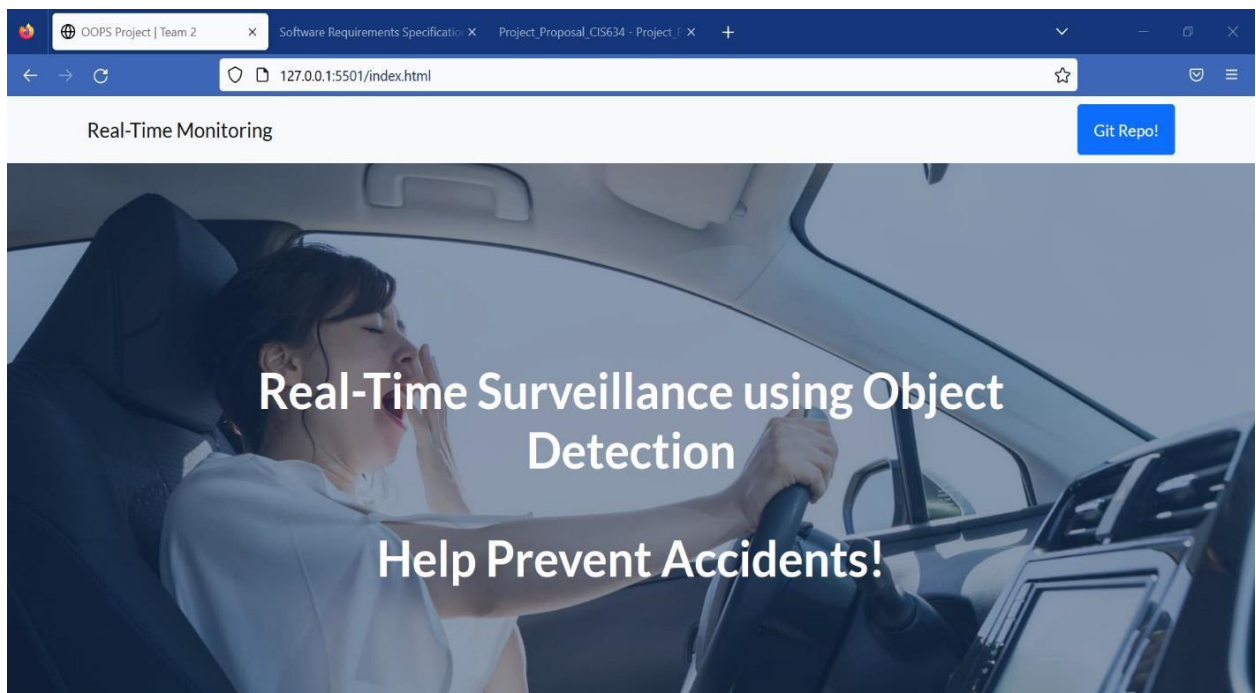
## B. Webpage in “Microsoft Edge”



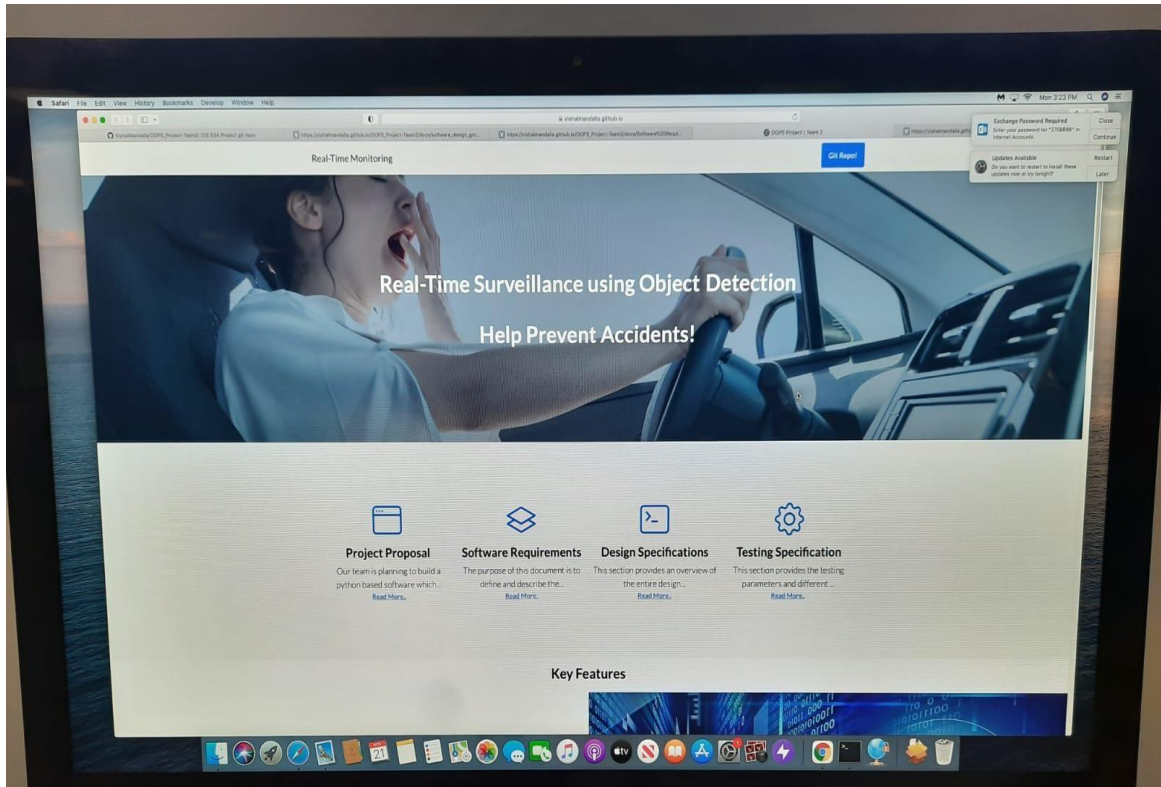
## C. Webpage in Avast Secure Browser



#### **D. Webpage in Mozilla Firefox**

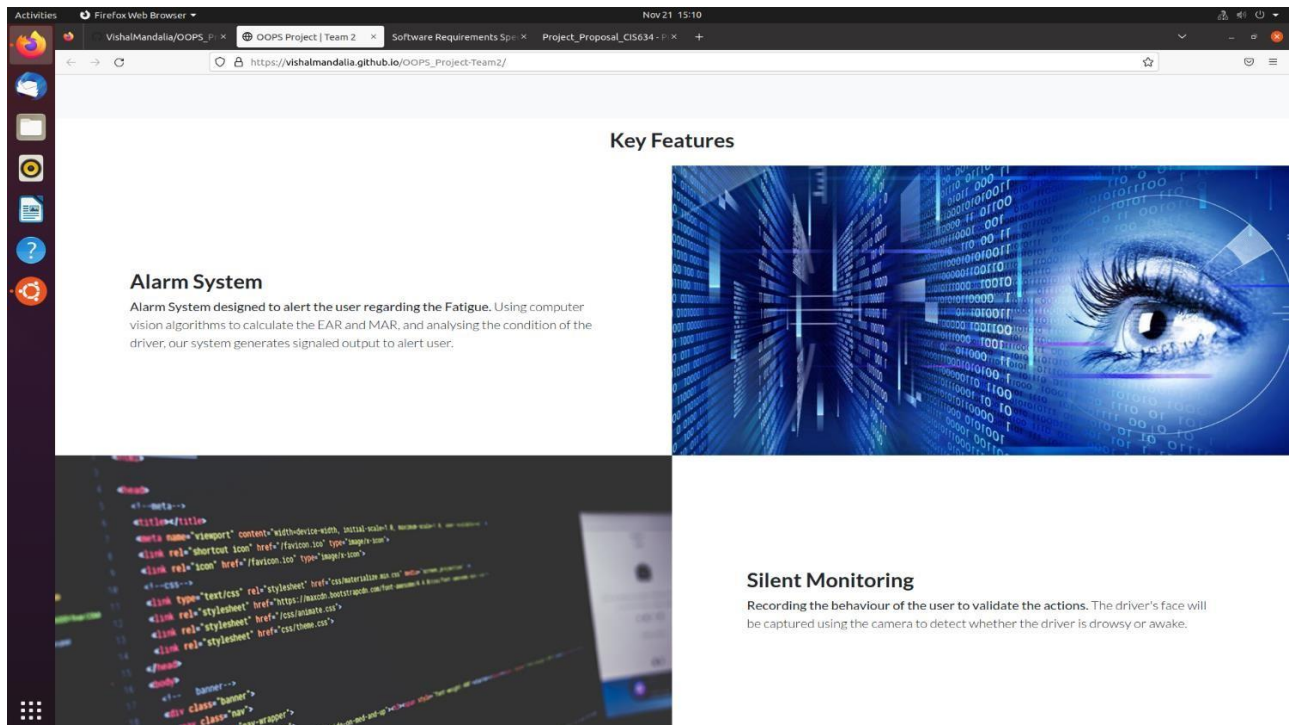
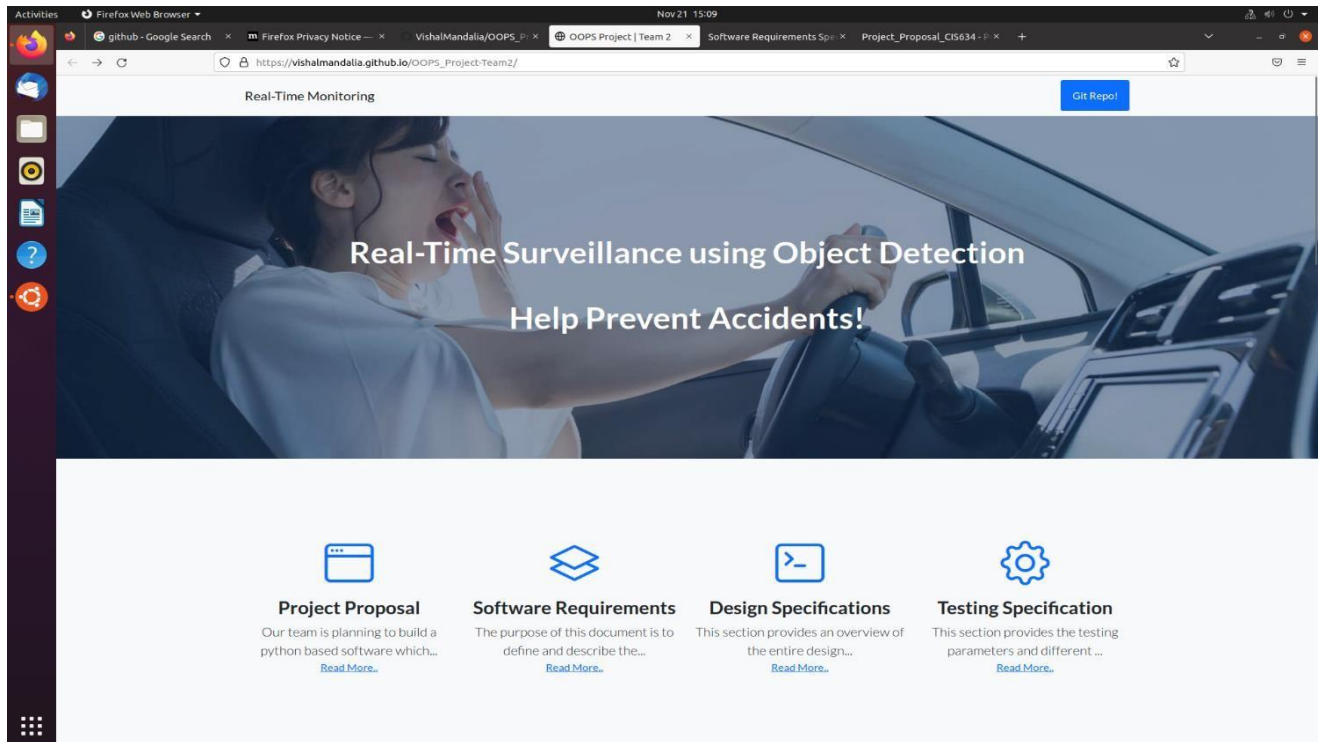


#### **E. Webpage in Safari Browser**

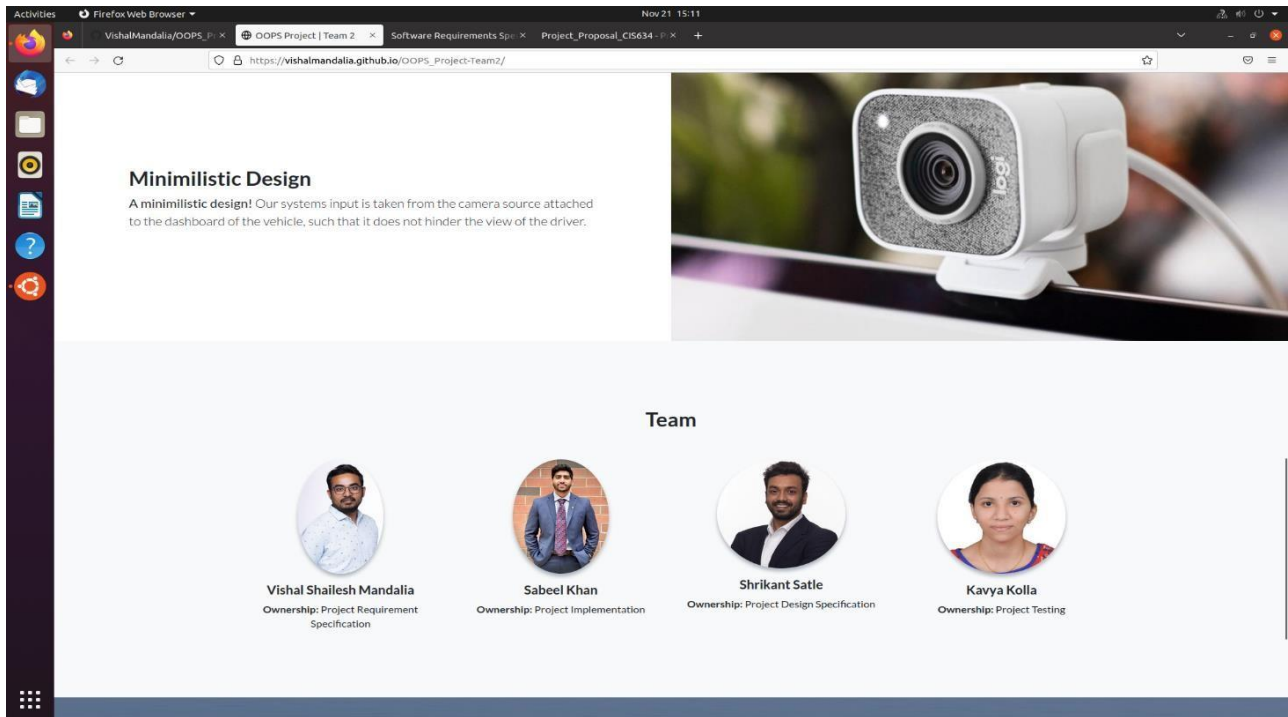


Test Case	Web NFTC-3
Name of the test	Platform Compatibility
Item Tested	Webpage
Sample Input	Webpage URL
Expected Output	Webpage should open correctly in any OS
Actual Output	Same as Expected Output
Remarks	Pass

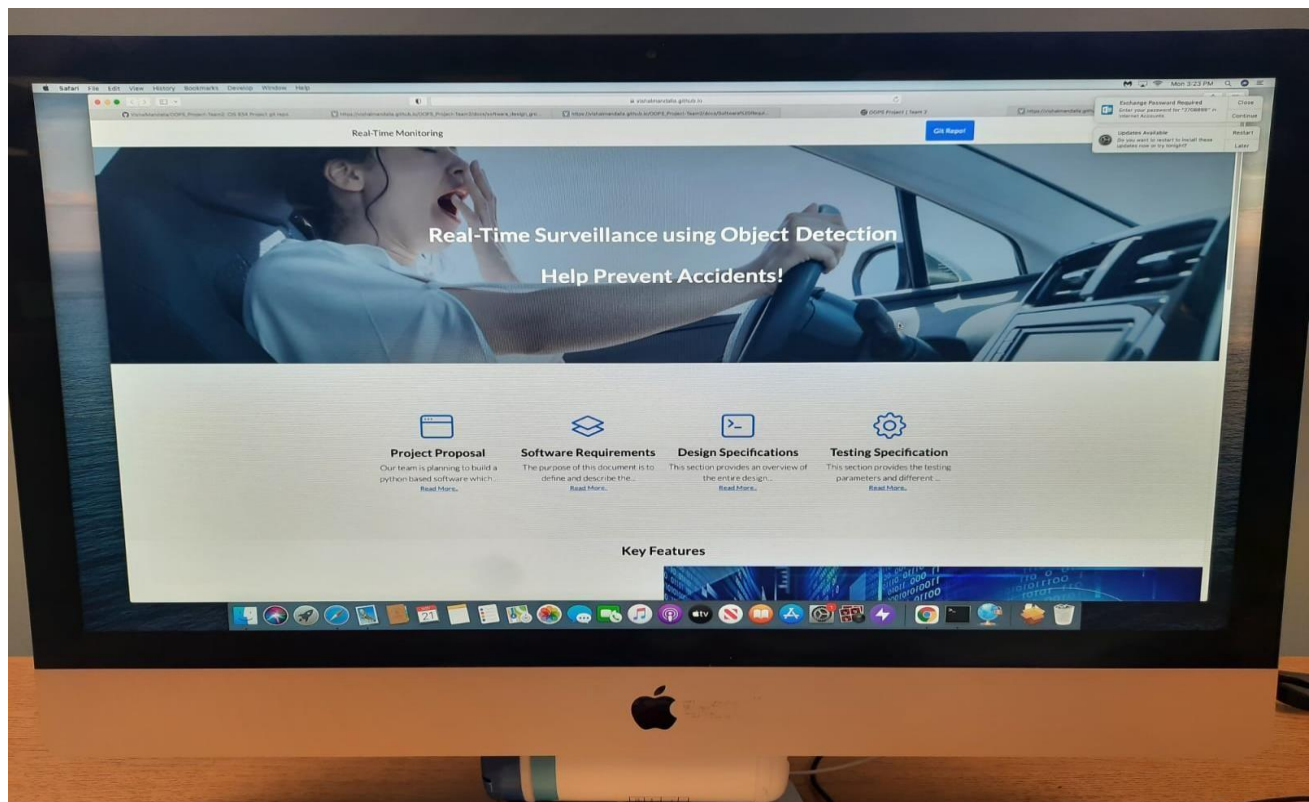
## a. Webpage in Linux OS

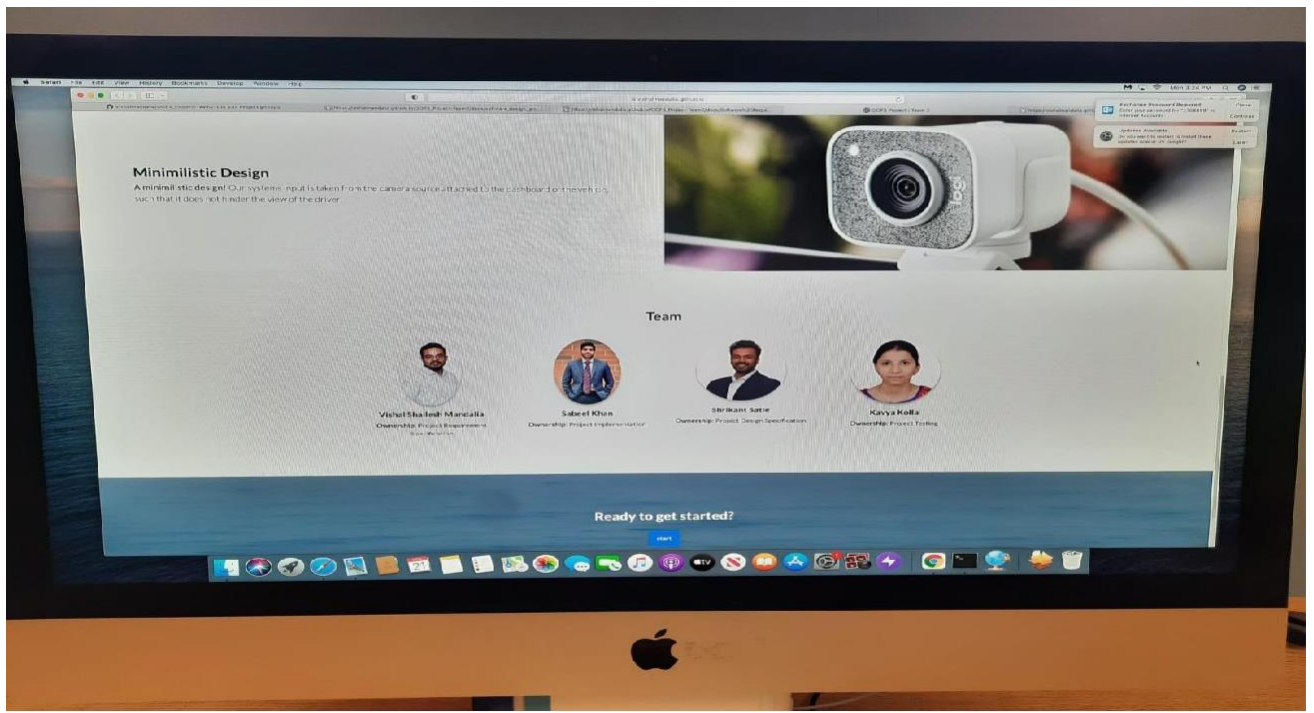
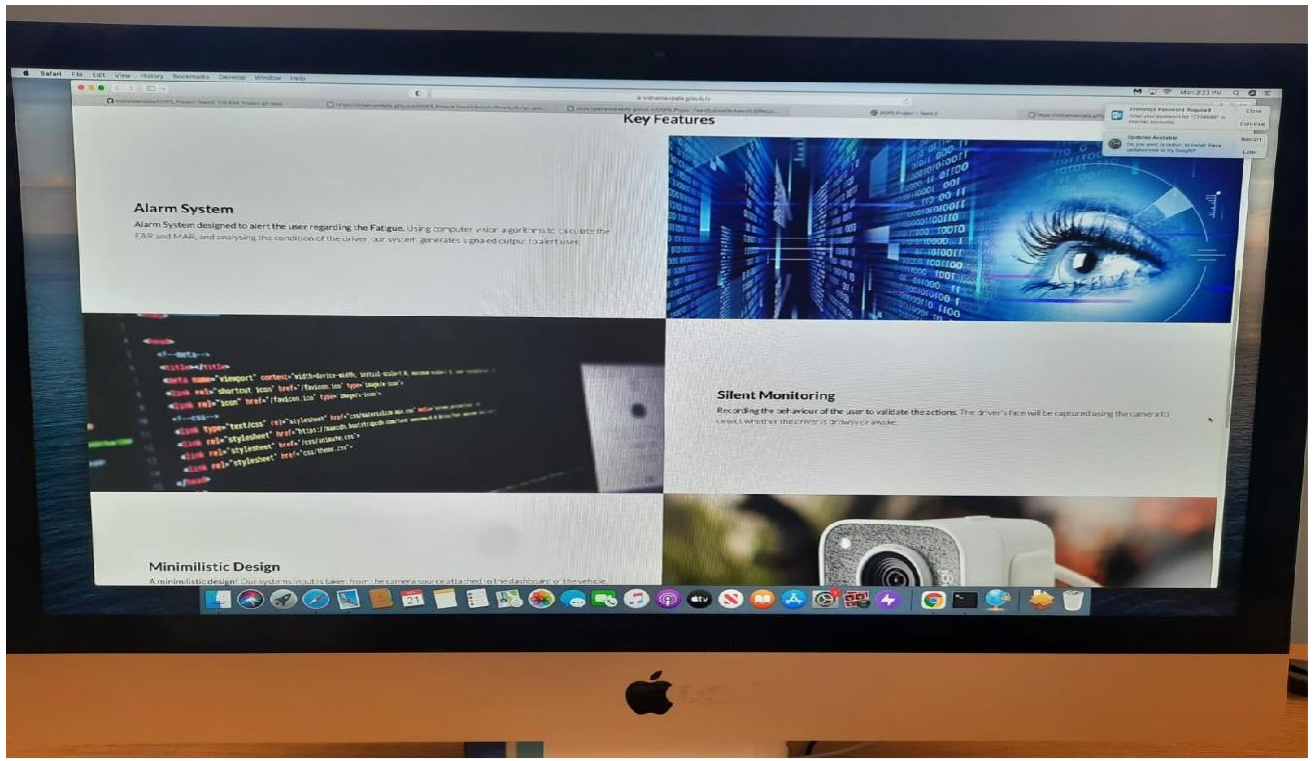






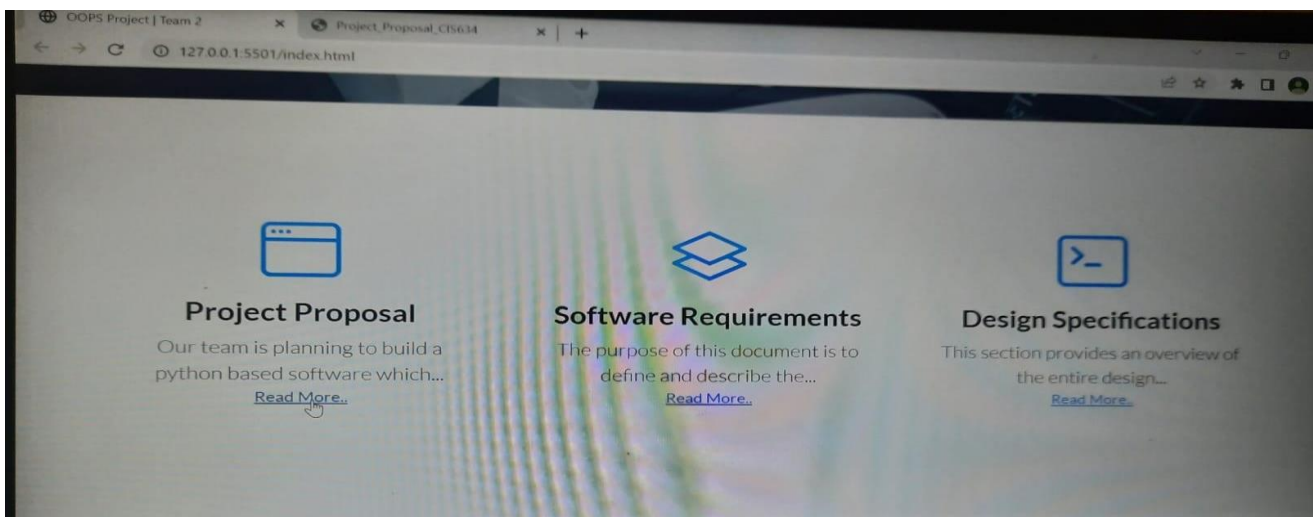
## b. Webpage in MAC OS



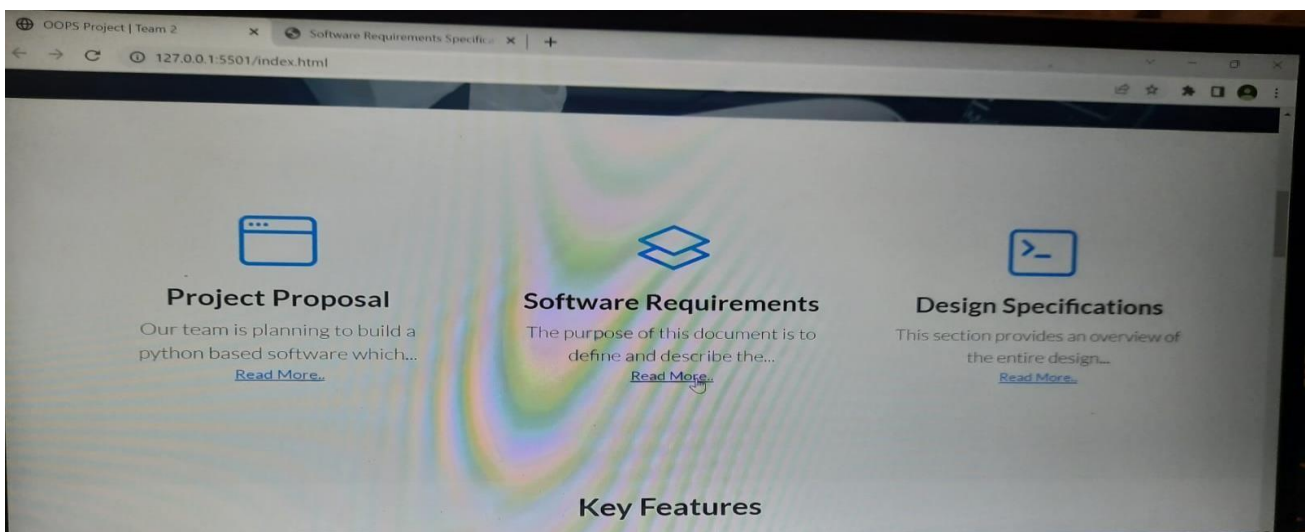


Test Case	Web UI testing
Name of the test	Links in User Interface
Item Tested	Webpage
Sample Input	Webpage URL
Expected Output	All anchor tags redirect to proper documents specified in href
Actual Output	Same as Expected Output
Remarks	Pass

If we click on Read More under Project Proposal Project\_Proposal\_CIS634 is opening correctly.



If we click Read More under Software Requirements Software Requirements Specification document is opening correctly.











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sabeelkhan23 / README.md

- I work with Python, SQL and Visualization tools.
- I currently work as a Data Quality Analyst at Conservis LLC
- I'm currently a graduate student at Cleveland State University majoring in Master's in Computer Science.
- 3+ years of working experience in Machine Learning, Data mining with large datasets of Structured and Unstructured data, Predictive modelling and Data Visualization.
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Pinned

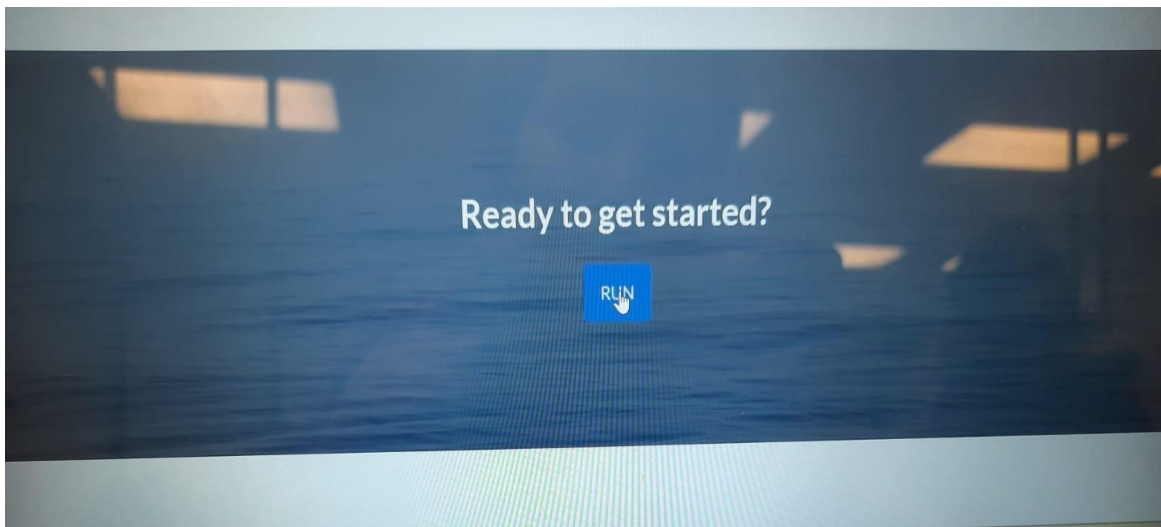
[Web\\_Scraping](#) Public

[Yelp-Business-Data-Set-Processing](#) Public





Test Case	Web UI testing
Name of the test	Buttons in User Interface
Item Tested	Webpage
Sample Input	Button in a Webpage
Expected Output	If we click run button,drowsy driver application should open up.If we click Git Repo,Group's Git repo should open up.
Actual Output	Same as Expected Output
Remarks	Succesful



**Drowsiness Detection!!!** 🙄



START

SELECT DEVICE

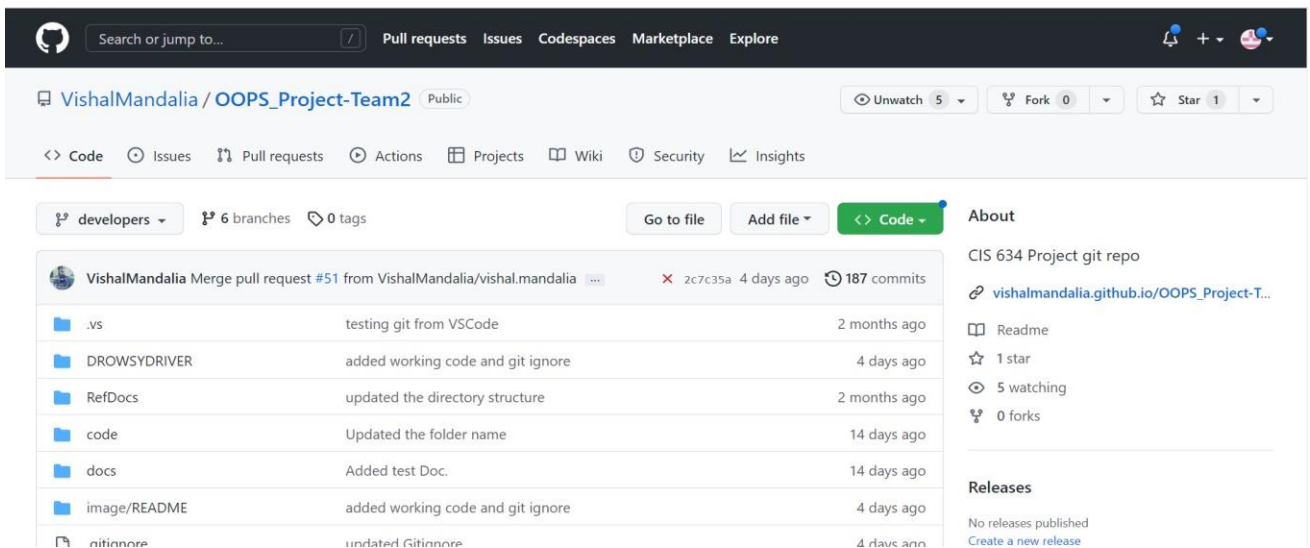
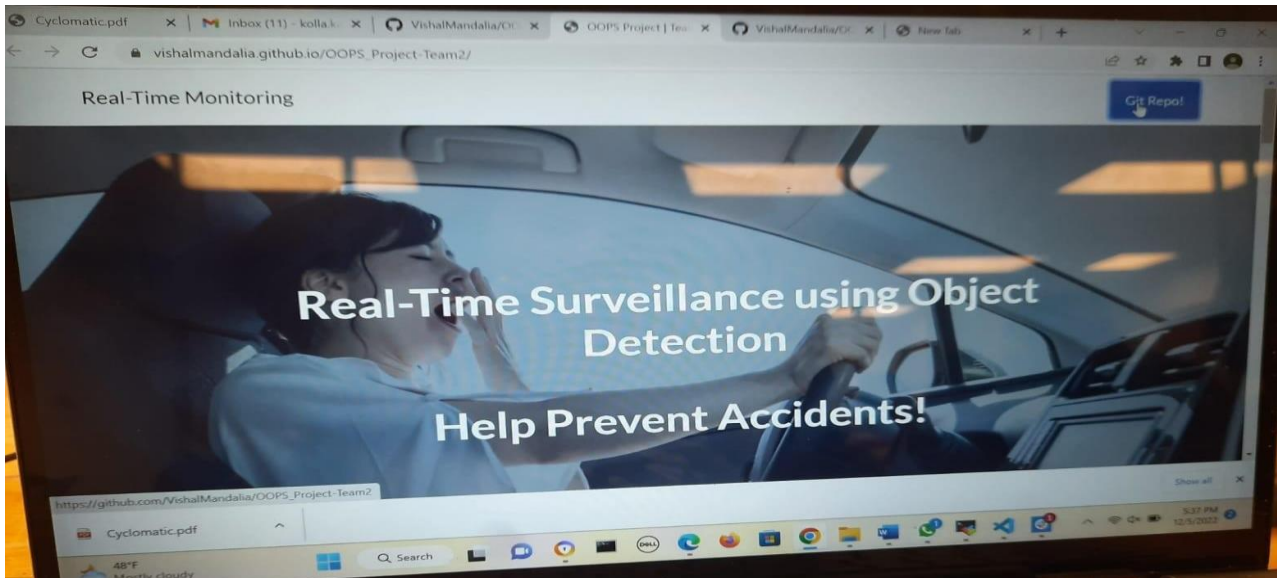
Seconds to wait before sounding alarm:



Eye Aspect Ratio threshold:



If we click on GitRepo, Github of our group opens up.





### **3.0 Test Cases:**

#### **ID:1**

Test Input: Eye Aspect Ratio(EAR) with min and max values as threshold.

Expected output: If  $EAR < \text{min threshold value}$ , alarm should ring up.

Description: In this test case we assign certain threshold values as min and max. Eye Aspect Ratio (EAR) is a metric that determines eye openness or closeness. The proposed system uses the eye aspect ratio to determine the active and fatigue or sleeping states. The more the EAR the more widely the eye is open, the min EAR value determines if the driver is drowsy and max EAR value determines if the driver is awake.

#### **ID:2**

Test Input: Region Of Interest

Expected output: We should have 68 points spread all over the face.

Description: Region of interest in this system focuses when the face is found it makes use of 68 points as facial landmarks. These coordinates helps in visualizing and train the system to detect the eye closure (Drowsy) or mouth opening (Yawn).

#### **ID:3**

Test Input: Wait\_time

Expected output: Time difference to come from max EAR threshold to min EAR threshold

Description: To determine whether the amount of time passed with  $EAR < EAR\_THRESH$  exceeds the permissible limit. This test case will help us analyze the time taking to drop from Max threshold to Min threshold and give us an average point.

#### **ID:4**

Test Input: Person wearing glasses

Expected output: Our software should verify facial landmarks of person wearing glasses and determine whether he is drowsy or not.

Description: The program checks if the person in the real-time frame is wearing glasses and decides validity or invalidity, and goes forward to correct the dimensions if the real-time frame is valid.

#### **ID:5**

Test Input: Background Detection

Expected output: Program should detect only one object at a time.

Description: This test case does not allow the program to detect multiple faces at the same time as the use case defines only one driver. No two users/individuals can view the real-time

surveillance frame at the same time.

**ID:6,7**

Test Input: Position of driver face-center, right

Expected Output: Software should detect drowsiness of a person facing center, left or right positions towards camera.

Description: When drivers face is positioned in center, left or right from camera, face, eyes, rate of blinking of eyes, yawn rate should be detected successfully and pop up an alert message if driver is drowsy.

**ID:8**

Test Input: Driver Face and pop up an alert if user is drowsy.

Expected Output: Software should pop up an alert message if driver is sleepy by checking EAR and MAR values.

Description: If the driver seems to be detected as drowsy then it will give an alert. The alert will be in the form of message as “YOU ARE SLEEPY..PLEASE TAKE A BREAK” and also in form of sound. The aim is to make the driver wake with that sound.

**ID:9**

Test Input: User Face, EAR value

Expected Output: If EAR value of eyes in a user face is min, then user is drowsy.

Description: EAR also known as Eye Aspect Ratio is the main criteria for detecting whether the person is drowsy or not. EAR has always has a constant value when the drivers eyes are open, but when the eyes close the value will be less than min threshold and it may drops to 0.

**ID:10**

Test Input: User Face, EAR value

Expected output: If EAR value is greater than min threshold, then user is not drowsy.

Description: Eye Aspect Ratio is the main criteria for detecting whether the person is drowsy or not. EAR has always has a constant value greater than zero when the drivers eyes are open.

## **Webpage test cases:**

### **ID:1**

Test Input: Webpage Functionality on different screen resolutions.

Expected Output: Web page should open properly in different screen resolutions.

Description: To test whether web application is working properly in different screen resolutions like (1024\*768,1280\*800,1440\*900,1600\*900...) using screenfly tool.

### **ID:2**

Test Input: Browser Compatibility of webpage

Expected Output: Webpage should display correctly in various browsers.

Description: To check if a page is accessible with other browsers such as Google, Microsoft Edge and Avast Secure, mozilla firefox.

### **ID:3**

Test Input: Platform Compatibility

Expected Output: software should work perfectly across multiple platforms.

Description: To check whether developed software works correctly on different platforms like windows, Linux and Mac.

### **ID:4**

Test Input: Links in User Interface

Expected Output: All links mentioned in anchor tag redirects to proper webpage or documents.

Description: All links should redirect to proper documents or URL's mentioned in the anchor tag reference(href).

### **ID:5**

Test Input: Buttons in User Interface

Expected Output: If we click on button, expected page should open up.

Description: If we click run button, drowsy driver application execution main page should open up. If we click on Git Repo button, Git repository of our group should open.