



USER MANUAL

**OverSee – an AI based Driver State Monitoring
System**

ABSTRACT

This manual is intended to give assistance to people using OverSee.

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TOOL DESCRIPTION



1.0 GENERAL INFORMATION:

General Information section explains in general terms the system and the purpose for which it is intended.

1.1 System Overview

In recent years, driver inattention or distraction is one of the major causes for road accidents. The inattention and anger detection system should be designed in such a way that it triggers the alert system only when the driver is distracted beyond the acceptable limit. Every year, In Bangladesh, many car accidents due to driver

fatigue and distraction occur around the world and cause many casualties and injuries. It occurs in Bangladesh primarily owing to the reckless driving of the drivers. Driver State Monitoring System (DSMS) is one of the main approaches for driver fatigue or distraction detection and accident prevention. Driver face monitoring systems capture the images from driver face and extract the symptoms of fatigue and distraction from eyes, mouth and head. The system estimates driver alertness based on extracted symptoms and alarms if needed.

1.2 Organization of the Manual

The user's manual consists of the following sections.

1. General Information
2. System Summary
3. Using of System

General Information section explains the purpose for which the tool is intended.

System Summary provides a general overview of the system. It outlines the uses of the system's hardware and software requirements, System's configuration, user access and risk factors.

Getting Started section presents briefly system menu.

Using of System section will have a detailed description of system functions.

2.0 SYSTEM SUMMARY

System Summary provides a general overview of the system. It outlines the uses of the system's hardware and software requirements, System's configuration, user access and risk factors.

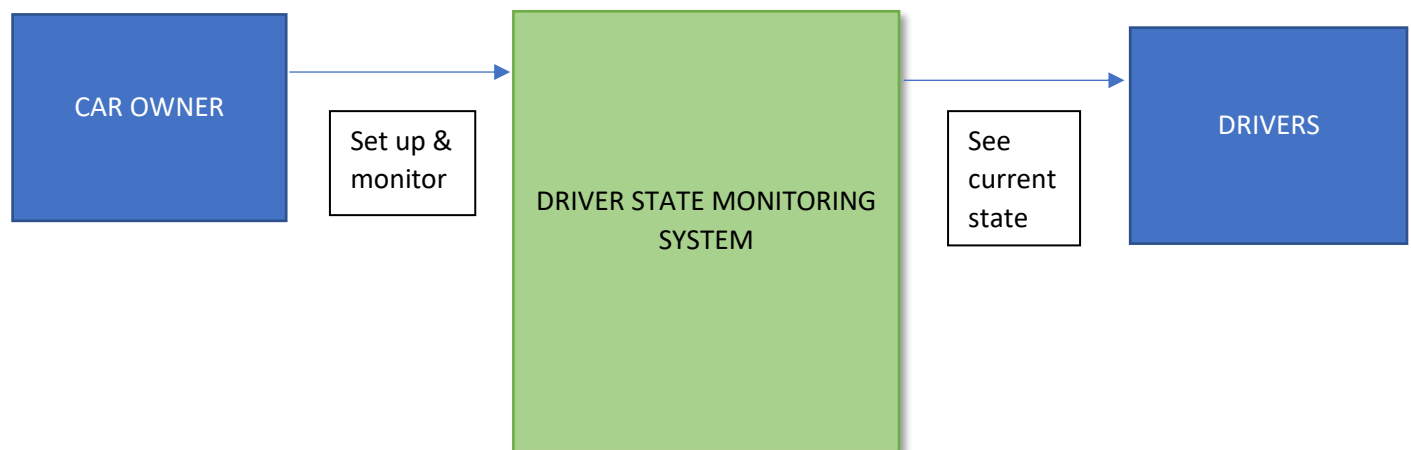
2.1 System Configuration:

Oversee operates on a dedicated device which is integrated with a web app and hardware tools. The hardware part has raspberry pi, pi camera, accelerometer and GPS sensor and a soundbox for the alarm. Maximum features can be run without any internet connection. Data are fetched simultaneously from firebase to show the driver his/her current state. For this feature we need to connect with the internet. It also requires for showing the current location on google map and suggesting nearby parking spots and Resturants.

2.2 User Access:

Oversee has mainly two types of users:

- Owner of bus, truck or car rent
- Drivers



3.0 USING OF THE SYSTEM:

3.1 Car Setup:

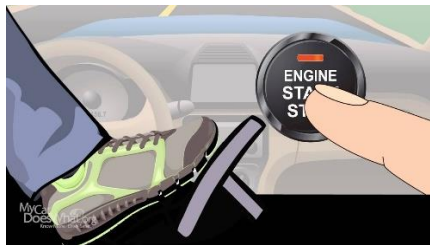
The device needs to set up with the car engine so that every time the car engine starts, the device automatically turns on and monitor drivers current state and detect if he/she is drowsy, disgusted or inattentive.

3.2 Device Setup:

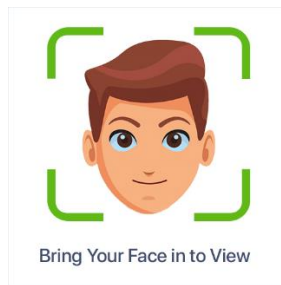
The device must be set up in such a way that the full face of the driver is in alignment with the camera, and face features are clearly visible. So that the detection can go smoothly.

3.3 Display Setup:

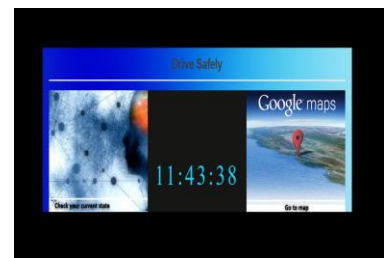
The display has to be in a position where it is visible to the driver and all the passenger. If its not set up in a correct manner, then driver wouldn't be allowed to observe his/her current state. Also, the passengers need to see the display so that they can be aware of current state of driver and ensure a safe journey.



Step – 1: Start the Car



Step – 2: Bring your face into View



Step – 3: automatic display setup

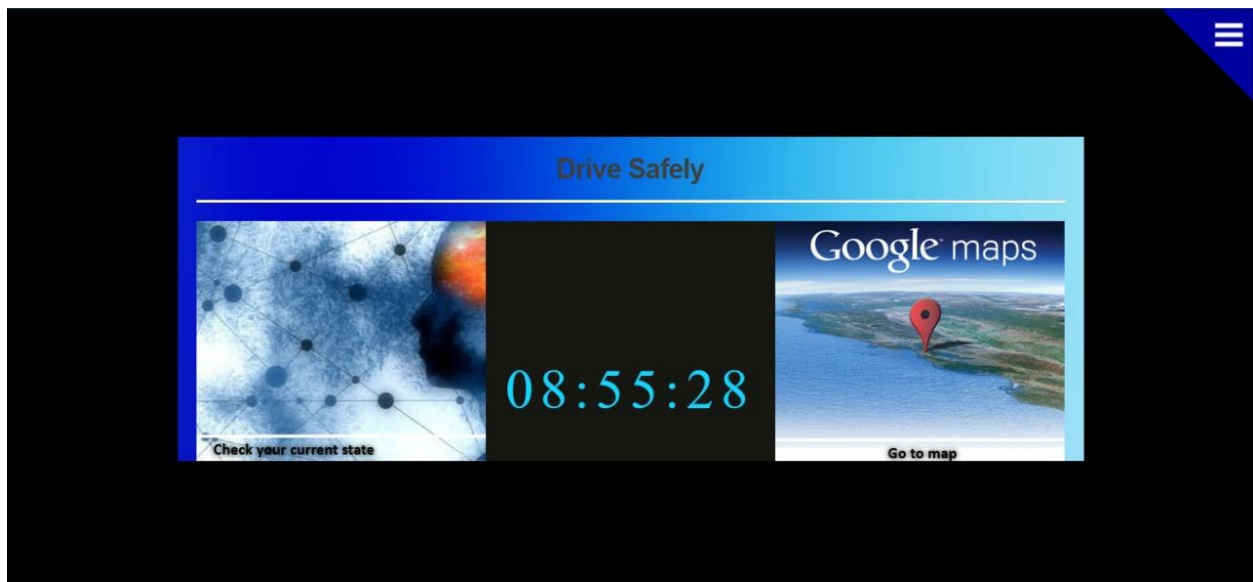
3.4 Start Button:

This is the homepage of our display. When the start button is pressed the device starts operating.



3.3 Navigation page:

driver can select option to check his/her emotional state or nearby location.



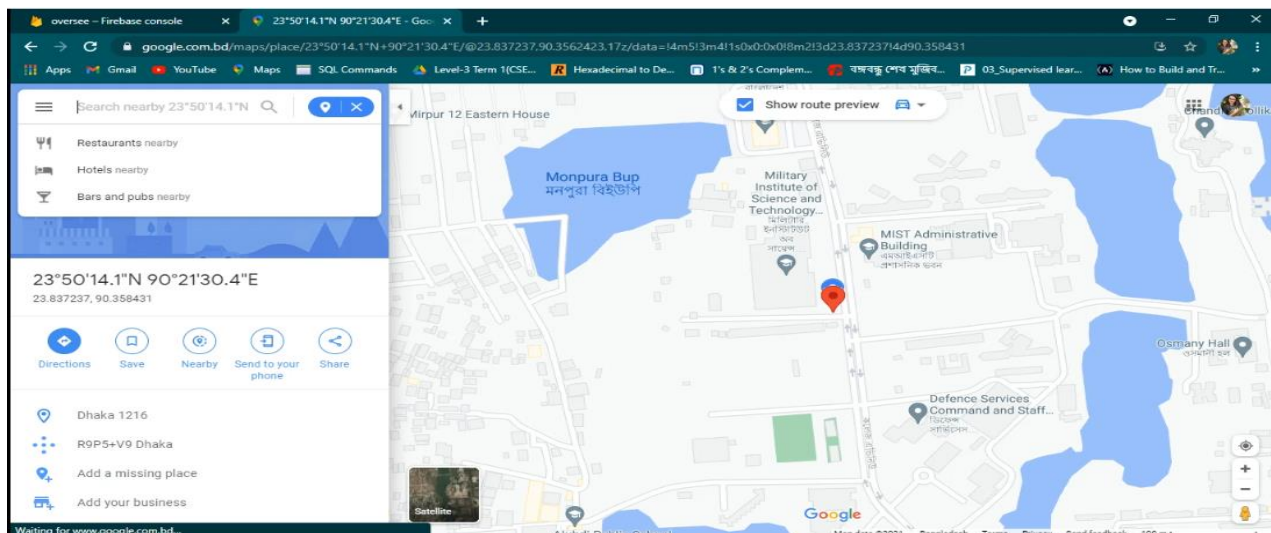
3.4 Show state page:

Driver can see his/her current state in this page. If driver is drowsy, inattentive or talking.



3.5 current location page:

Map has an option called nearest. By clicking this option user can check nearest restaurant, coffee shop, parking slot. This is a feature of google map which we are using for our convenience.



3.6 Inattention detection:

The inattention is detected by measuring two parameters. Talking detection and no face detection.

3.6.1 Talking detection:

If the driver talking with someone for a certain time say 60 sec, then alerts the driver that he is talking while driving and being inattentive.

3.6.2 No face detection:

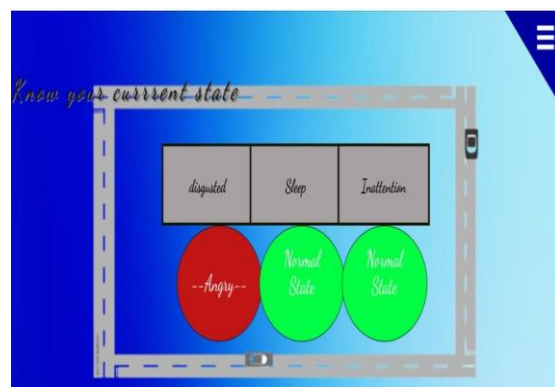
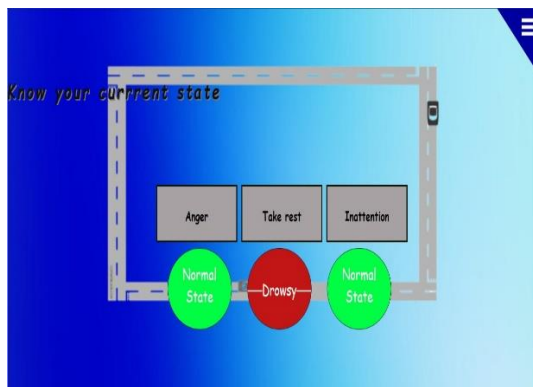
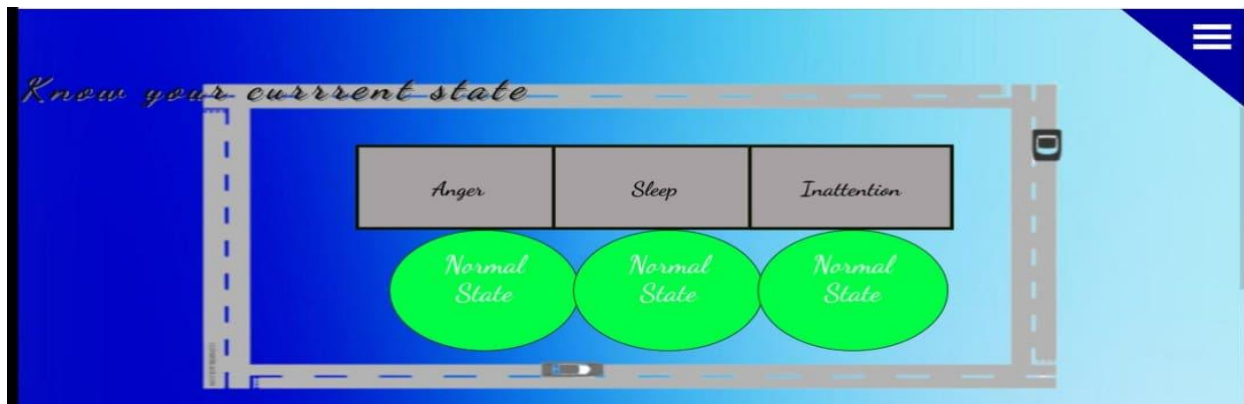
If the driver is not looking in the front and face is turned in other direction for a long time then face won't be detected in pycam and if accelerometer sensor data defines that car is moving , then no face detection is a risk for driver and alarm is given.

3.7 Drowsiness detection:

Drowsiness is detected by measuring the eye aspect ratio (EAR) and yawning detection. If the driver is yawning for a certain time, the device will alert the driver that he/she is drowsy and must take rest or park the car. In the web app the yawn detection color will go red and blink and also the voice command from the sound system will tell the driver to be alert.

3.7 Disgust detection:

If the driver is disgusted for a long time alert is given otherwise it is risky for drive to drive at this hyper emotional state.



4.0 Risk Management:

Risk of Project					
Risk number	Description	Mitigation Plan (to avoid)	Contingency Plan	Impact	Likelihood of occurrence

1.	Error in fetching data	Checking of equipment's	Restart the sensors	Wrong result	medium
2.	Failure in integrating all parts	Check every equipment before connection	Set up individual parts	The system will collapse	medium
3	Sensor burn	Carefully handle every sensor	Replace the sensors with alternatives	The data would be inaccurate	High
4	Raspberry pi burn	Minimize the amount of data	Check the storage and run the system accordingly	The device will breakdown	Low
5	Failure in proper device placement	Placement should be accurate to detect face	Remove the whole set up and do it again	The result won't be accurate	medium