Smart Alert for Real-Time Driver Drowsiness and Driver Safety System

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ABSTRACT:
In this system we can safe a driver and reduce road accidents. The **Haar face detection** algorithm is very mice can detect driver face and extract eye **EAR** and mouth for driver fatigue detection. In this system we are going continuously monitor the driver's face and detect if he is sleeping alert him. Then the machine is going to hit up a message and mobile phone call to the driver's boss automatically is called **SAS**.

The proposed module is to track driver mobile usage detection. A driver's attention is often caused by using cell phone while driving. So, the machine is raised to warning if driver is using a cell phone.

If a driver is drinking alcohol and not wearing seatbelt, the machine will detect it using sensor and stop the vehicle from starting. Except all the mentioned above the accident will happen, then machine find it out. So, the framework so planned is a non-meddling constant checking framework. The need is on working on the wellbeing of the driver without being prominent. Then, system architecture is clearly proposed and accuracy is improved.

Keywords: Haar Face Detection, EAR, Fatigue Detection, SAS, Mobile Usage Detection, Seatbelt and alcohol detection, Accident Detection.

I.   INTRODUCTION:

In present times, road accidents are happening a lot and the loss of life is increasing. So, this system can reduce road accidents and its impact. The framework depends on deep learning, so monitors the driver's situation continuously.

SYSTEM ANALYSIS:
EXISTING SYSTEM:

Driver tiredness discovery is a vehicle security innovation which forestalls mishaps when driver is getting sleepy. Driver mindlessness may be the consequence of absence of readiness while driving because of sluggishness and interruption. The framework cautions driver through alert progressively.

The current arrangement of driver tiredness discovery framework has following drawbacks[1]. Principally, utilizing of two cameras in the framework one for observing the head development and the other one for looks. The other hindrance is maturing of sensors and this large number of sensors are appended to the driver's body which might influence the driver. So, to beat this large number of hindrances we planned a framework in which a live camera is utilized for checking the driver tiredness condition and caution the driver which decreases the street mishaps.

PROPOSED SYSTEM:

Clear and well-defined architecture is proposed. Driver safety module is major advantage of this system. The vehicle will stop immediately if the driver falls asleep, does not wear a seat belt, or is under the influence of alcohol. Fastest method of alert system is proposed both driver and his boss if driver as sleep [1].The further develop engineering chart is deeply characterized. Virtualized IoT method is proposed. All the process is controlled by virtual sensor in proteus simulator. These methodologies are simple method for recognizing driver sleepiness status on constant

PURPOSE OF THE SYSTEM:
* Low cost
* Experimental Control and More Efficient to detect a driver drowsiness.
* May reduce the mortality.

MODULE DESCRIPTION:

DRIVER FACE DETECTION:
To detect the driver face using Haar cascade classifier. The algorithm triggered very fastest detection of driver's face.

DROWSINESS DETECTION AND ALERT:

$$EAR = \frac{\|p_2 - p_6\| + \|p_3 - p_5\|}{2\|p_1 - p_4\|}$$

This formula is used to calculate Driver Eye state. We would conclude a base EAR (Eye Aspect ratio) esteem and utilized this to choose if the eye is shut or not. Calculate the upper and lower lips distance for yawn detection. Both conditions are concluding driver fatigue and vehicle is stop automatically.

If the driver is in tired the caution is raised by the SAS (Smart Alert System) arrangement. The alert call will be sent vehicle proprietor naturally.

DRIVER SAFETY MEASUREMENTS:
- The IR sensor detects driver's seatbelt wear status. Else, Vehicle cannot start and Alarm is raised.
- The Gas sensor detects driver's alcohol drink status. Else, Vehicle cannot be start and Alarm is raised.
- The Vibration sensor will detect if the vehicle is happening accident. Sent the vehicle location to registered mobile no as a SMS.

MOBILE USAGE DETECTION:
When driver using mobile phone while driving a vehicle, the alarm is generated automatically and call alert sent to the vehicle proprietor. This segment may reduce more accidents while driving a vehicle.
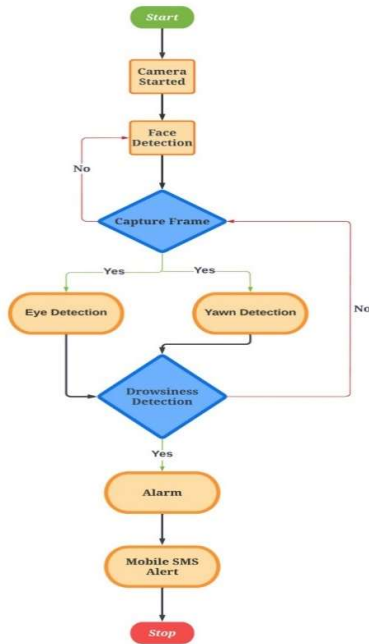
ARCHITECTURE DIAGRAM:

Fig: Detailed Architecture of this **Sys**tem

DATAGLOW DIAGRAM:

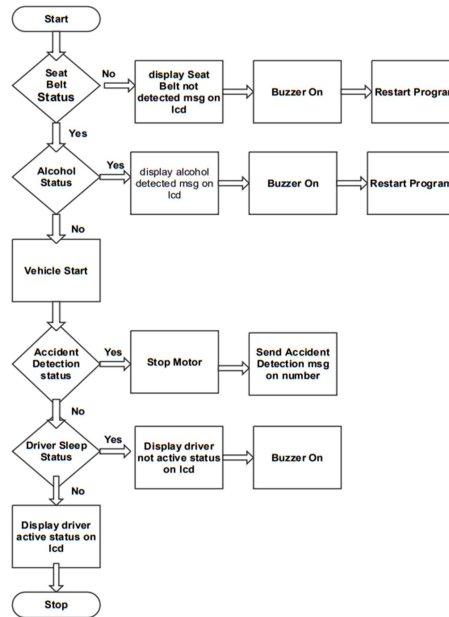**Fig:** Drowsiness Detection **Sys**tem

Fig: Driver Safety System

THEMATIC DIAGRAM FOR PROPOSED SYSTEM:
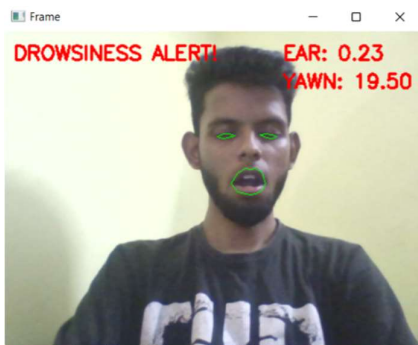
Fig: Driver **Drowsiness** Alert
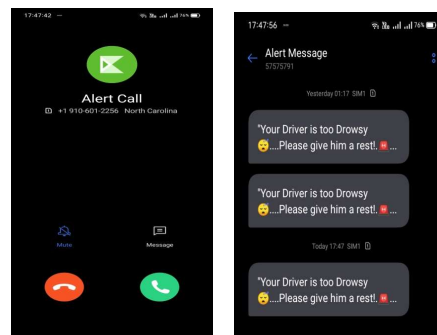
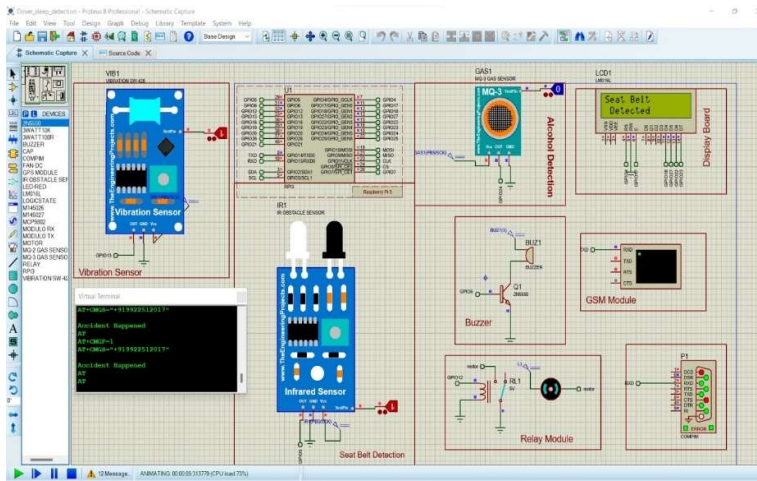**Fig:** Owner's Alert

APPROACH OF VIRTUAL IOT METHOD:

Fig: Simulator PCB Layout

Fig: Location Finder

II.

III.   CONCLUSION:

This exploration gives a vigorous strategy to identifying tiredness of drivers and crash influence (seriousness) system in right now. On the off chance that the EAR esteem tumbles from the limit range, the framework desperately alarms utilizing discourse speaker and cautioning SMS and Call to the owner (proprietor) for extra strong awareness of the driver. Furthermore, estimation of crash seriousness (influence) is made through execution of sensors with the GPS module to appropriately follow the area of mishap in this way cautioning the closer clinical benefit place to serve crisis determination.

FUTURE ENHANCEMENT:

- Transfer learning approach is revolute this project.
- Mental ability check is clearly defined driver drowsy.
- Self-driving cars will be following this approach.
- If, collision is detected the message will pass nearest located hospital. The method is saved human lives.

REFERENCES:

[1] https://www.researchgate.net/publication/349964463_IoT-Based_Smart_Alert_System_for_Drowsy_Driver_Detection

[2] https://www.sciencedirect.com/science/article/abs/pii/S0893608014002135   for   Deep learning.

[3] https://pyimagesearch.com/2017/08/21/deep-learning-with-opencv/   for   OpenCV framework.

[4] https://www.tensorflow.org/tutorials   for other Libraries. Like, TensorFlow, Keras, etc.

[5] https://www.twilio.com/docs/tutorials?filter-language=Python for API Reference.

[6] https://www.labcenter.com/simulation/   for Circuit simulation.

[7] https://www.finoit.com/blog/top-15-sensor-types-used-iot/ for IoT Sensors description.

[8] https://projects.raspberrypi.org/en/projects/raspberry-pi-getting-started for Raspberry-Pi programming in proteus.

[9] https://create.arduino.cc/projecthub/projects/tags/arduino for other's sensor coding's.

[10] https://www.virtual-serial-port.org/article/com-port-in-proteus   for connecting python and proteus.

[11] D.RANJITH, An Efficient Method for Identification of Faces for 2D Images", International Journal of Engineering and Technology –Volume5 Issue2-April 2013, pp.1010-1015.

[12] D.RANJITH, Low power area efficient adaptive FIR filter for hearing aids using distributed arithmetic architecture" in the International Journal of Speech Technology, 23(2), pp. 287–296,2020.