

IOT BASED HEALTHCARE MONITORING SYSTEM FOR DRIVERS

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ABSTRACT

Driver drowsiness and distraction are the two main reasons for traffic accident. And also the drunk driving plays a major role. In this project monitors the driver's healthcare continuously. Three sensors are used for detection. They are, alcohol sensor, Eye blink sensor and heart beat sensor. Eye blink sensor is used to detect the eye, whether it is closed or not. In image processing techniques, HAAR cascade classifier is used for face detection. This system will also have Alcohol sensor detects whether the driver is in drunk state or not. And additionally heart beat sensor is used to detect the drivers heart beat rate, it is placed in seat belt of the vehicle.

Keywords-Heart beat sensor, Alcohol sensor, Eye blink sensor, HAAR cascade classifier

1. INTRODUCTION

Internet of Things (IoT) has a major growth in this modern world. Driving while drunk state or in drowsy state cause the accident. This system has proposed to improve the drivers safety, Because significant amount of accident still occurs. Three sensors plays a major role in this project.

Eye blink sensor is used to detect the eye position using HAAR cascade classifier. Eye index and pupil activity were computed from a video segment, that was captured by the web camera. If any irregularities found in the detection, vibration motor is ON and buzzer alarm gives a alert sound to the driver, if the driver is not response automatically the engine will be turned off and the message will be send to the corresponding owner through IoT.

Heart beat sensor continuously monitors the heart beat rate of the driver. It is present in the seat belt of the vehicle. If driver's heart beat is abnormal, Message will send to the corresponding owner and the nearby hospital.

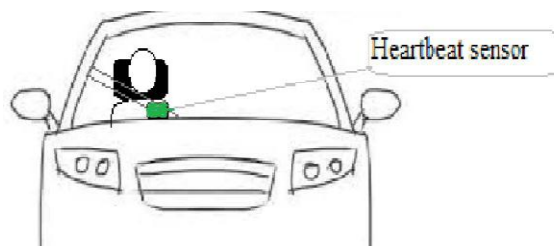


Figure 1.1 Heart beat sensor in seat belt

If driver is died, the engine will be stop automatically and GPS(global Positioning System) will found the location and the location will be send to the corresponding owner and nearby hospital using GSM(Global System for Mobile).

Alcohol sensor will detects alcohol level which consumed by the driver. After the detection , Arduino controller compare the alcohol content that was detected by the sensor with normal content of alcohol. If the level of the alcohol that was consumed by the driver is higher than the normal level, controller accomplish the code that would not allow to start the vehicle, Engine would be turned off.

Arduino controller is used to store a data and program. Python software is used for this system, web camera will detect the face and eye position of the driver by using Ad boost algorithm and by adaptive template matching.

2. LITERATURE SURVEY

- Eye tracking system for driver drowsiness is the application of the viola jones algorithm and percentage of eye closure(Parclos) [1]
- Driver behavior analysis of safe driving ,vehicle to vehicle communication using IoT and it support vehicular adhoc network for safe driving [2]
- The impact of traffic-light-to-vehicle communication on fuel consumption and emissions reduces the fuel consumption and the speed optimization and speed adaptation [3]

- Road traffic accidents (RTAs) due to Drunken driving in India challenges in prevention, drunken driving leads to accidents and endangers the road safety and prevents the accidents [4]
- An Embedded GSM based, Multiparameter, Real time patient(Drivers) monitoring system and control [5]
- Real time non instructive monitoring and detection of eye blinking in view of an accident due to drowsiness, it detects using digital image processing technique using open CV software [6]
- Detection of driver drowsiness using wireless wearables , collects the driver's physiological data by biosensor and analyze the data [7]
- The design of automotive Anti-Drunk driving system to guarantee the uniqueness of driver, image processing auxiliary surveillance, it eradicate the drunk driving [8]
- A vision based system for Monitoring the loss of attention in Automotive drivers , face detection using Kalman filter and eye detection using local binary pattern [9]
- Heart attack and alcohol detection sensor monitoring in smart transportation system using Internet of Things, Engine will be turned off due to abnormal condition of the driver [10]

3. METHODOLOGY

For a drowsiness detection, two visual features should involved. They are Eye state detection and head position. And alcohol sensor is detect the driver is drunk or not.

Eye State

Singe Web camera is used for eye and face detection. the detection of Eye and face using adaboost algorithm and adaptive template matching present in DIP(Digital Image Processing) . The visual features like eye index and pupil activity can be computed as vedio stream for a particular duration. The detection has two classifications such as, alert and non alert state based on driver is distracted or not. Error digression between the estimated pupil centers.

Pupil center positions are represented as Cleft and Cright . And the threshold level is 0.25. Figure 2 shows the System diagram of eye and face detection.

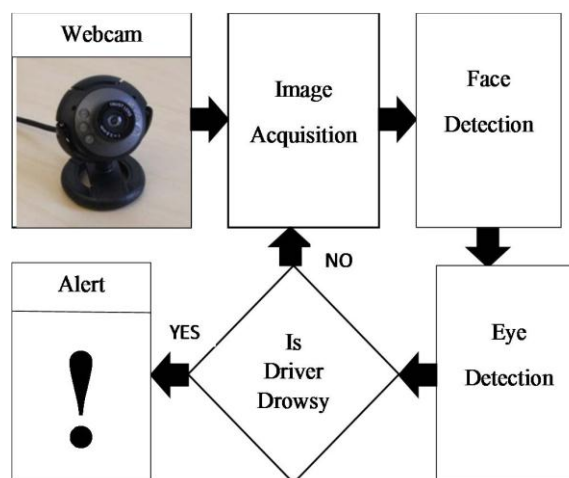


Figure 2: System diagram of eye and face detection

Face detection using HAAR cascade classifier has some following algorithm. Such as

- Web camera is used to detects the driver's face real time
- After the detection of HAAR Cascade classifier, ROI(Region of Intrest) is selected on the facial image
- And the eye will be detected using selected ROI

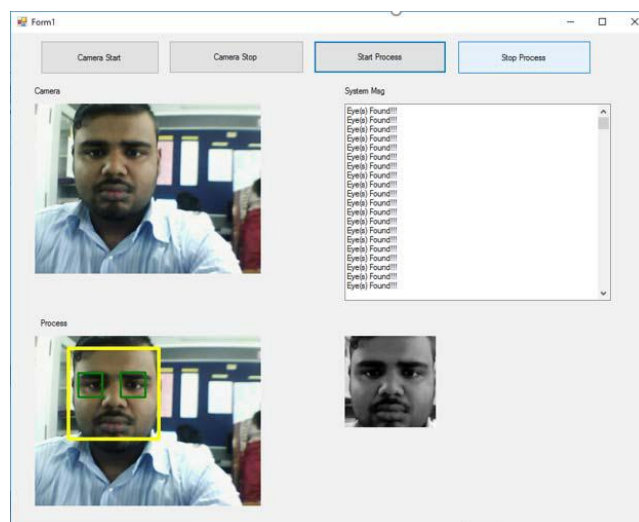


Figure 3: Detection of face and eye

Head position

HAAR cascade classifier is Used for face detection, Using kalman baser filtering technique.

These type of detection detect faster rate without contains losses.

4. PROPOSED WORK

In proposed system, additionally the heart beat sensor is added in seat belt of the vehicle. This sensor continuously monitors the drivers heart beat rate, if it is abnormal condition means the message will be send to the corresponding owner and nearby hospital. If he is died, the GPS (Global Positioning System) will found the location and send it to the message via GSM (Global System for Mobile).

BLOCK DIAGRAM

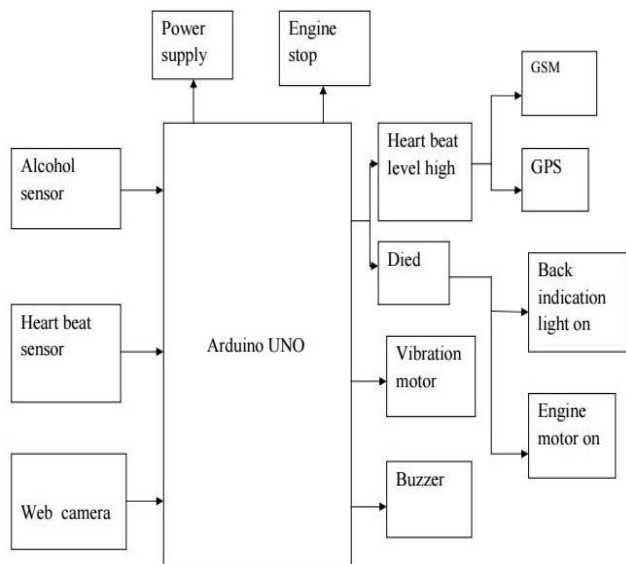


Fig.4 . Block diagram of the proposed architecture

Alcohol sensor

It is used to detect the alcohol level which is drunk by the driver. If driver is in drunk state, the engine cannot be ON.

Heart beat sensor

If driver is attacked by cardiac arrest, the message will be send to the particular owner of the car and the nearby hospital. If he is died means, back indicator light is on and the engine will be turned off automatically.

Web camera

Web camera is used to capture the video streams. At real time it is placed in the front mirror of a vehicle. Image processing technique is used for face detection. HAAR cascade classifier is used to detect the drivers face.

GPS (Global positioning System) & GSM

GPS is used to find the location of the car. If accident occurs, the location will be shared to the particular owner of the car and the nearby hospital. GSM is used to send a message to the owner of the car and the nearby hospital.

Buzzer

Buzzer is used to alert the driver. If driver is in sleepy state, it will give a sound.

Vibration Motor

If the driver is in drowsy state, vibration motor is turned on to alert a driver

FLOW DIAGRAM

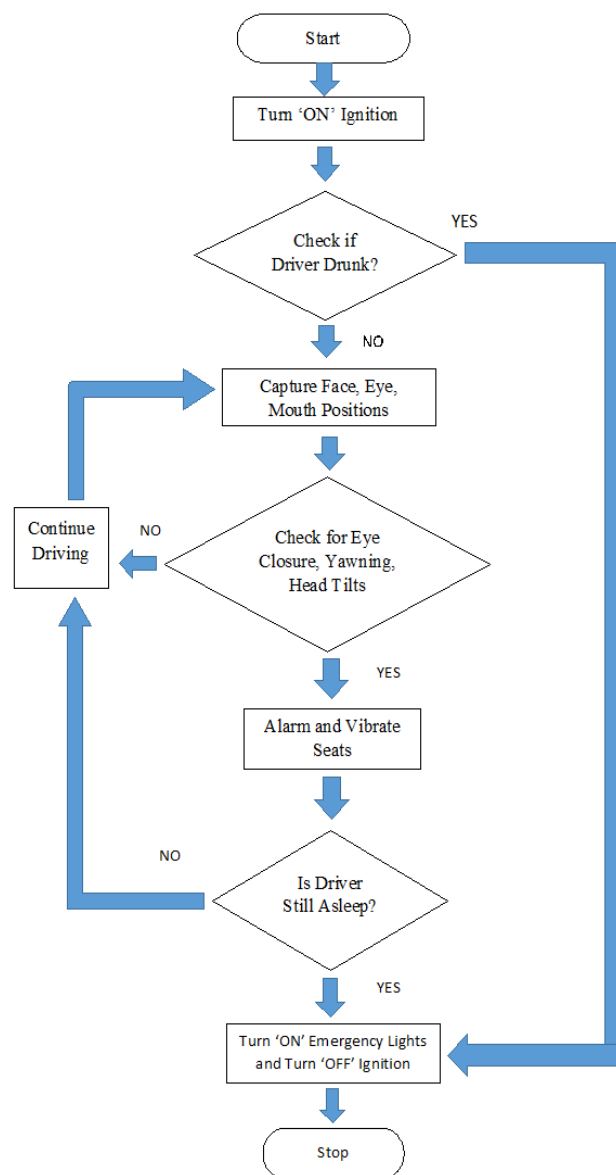
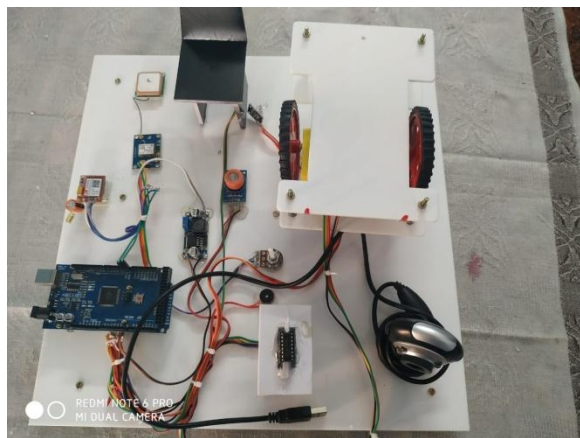


Figure 5: flow events for the drunk and drowsiness

Figure 5 shows the events for the drunk and drowsiness. The procedural events are shown below. The driver while entering into the car which turns ON. To check the alcohol detection manually by the driver using alcohol sensor. If the driver is in drunk state, the engine would be turned off. If the driver is not drunk state, the web cam will capture the face and eye position for drowsiness detection. If the eye closure is found, vibration motor turns ON and buzzer gives sound to alert the driver. If the driver is in continuous drowsy state, engine would be turned off and LED act as emergency indicator.



Output

Figure.6. Hardware architecture of Proposed

Figure.6. shows the Hardware architecture of Proposed unit.

5. CONCLUSION

To detect the driver abnormalities by using three sensors. If any abnormalities found atleast the engine would be turned off state and LED act as emergency indicator, it will prevent an accident like the proverb "Prevention is Better than Cure". It will reduce the accident.

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