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# **Vehicle Safety, Drowsiness of Driver and Alcohol Intoxication Detection System**

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**ABSTRACT:** Nowadays accidents are rapidly caused due to Driver's drowsiness and Alcohol intoxication. The main goal of this work is to reduce number of road accidents and minimize death consequences. In case, if the driver is drowsy then the condition of the driver can be estimated through facial expressions and driving behaviour. We have used OpenCV and Dlib library to analyze the drowsiness level of the driver. We have also made use of sensors like alcohol sensor which will detect the intake of alcoholic consumption.

**KEYWORDS:** Arduino, Zigbee, Open CV, Micro electro mechanical system (MEMS), Fatigueness

## **I. INTRODUCTION**

The primary purpose of this work is to develop a system that can reduce road accidents. According to the recent survey, the fatigueness of driver is upto 20% and due to alcohol drinking it is upto 31% of all road accidents. The first purpose of this system is to detect the drowsiness level of driver using a camera. Eyes and mouth are the main parts which are captured by a camera for detection purpose. Eye detection will be done using OpenCV. In case, if the driver is alcoholic then the alcohol sensor detects whether the driver is drunk/not. This helps in the reduction of road accidents. Today drowsy driver is a serious problem that leads to thousands of accidents each year. The system focus either changes in eye movement, physiological measures or drivers performances. Objective of this work :

- To capture the image of an unauthorized person when any pressure applied.
- To reduce the speed of the vehicle when the driver is drunk/drowsy.
- To reduce the death consequence using alarm.
- To detect the drowsiness of the driver using camera.
- To track any vehicle in real time using google maps.

## **II. LITERATURE REVIEW**

Dwijjoy Sarkar and Atanu Chowdhury, "A Real Time Embedded System Application for Driver somnolence and Alcoholic Intoxication Detection", This article expressed the detection of massive numbers of road accidents that takes place because of fatigue or alcohol drinking of the driver that cause the major road accidents [1].

T. D Prasanthi, K. Rajasekhar, T.V. Janardhanarao, and B.V.V. satyanarayana, "Design of ARM based mostly face Recognition system exploitation Open CV library". this can be connected to USB camera for continuous pictures are captured and these pictures are processed with facilitate of Opencv and compared with existing information. If the present pictures are matching with any of the prevailing pictures the system generates command to the output unit to perform the location/situation identification exploitation GPS and forward the mandatory information regarding the known person exploitation GSM/GPRS to concern authorities [2].

Naveen M. and Sudarvizhi S., "Finger Vein Recognition based mostly Driver and Authentication application System exploitation GSM", once someone needs to drive, can simply press their finger within the biometric system. once the finger vein is match automobile get lighted, this may be keyless authentication system. If the

matching fails GSM get triggered on and transmits warning message. Same automobile has the ability to sight fatigue and intake of alcohol by the driver. GSM, camera and buzzers are interfaced with Raspberry pi [5]

### III. ARCHITECTURE

The system is based on the ARM Processor connected to the Ultrasonic sensor, Tilt sensor, Alcohol Sensor & Fingerprint Sensor. The Fig. 1 Shows the diagrammatic representation of the alcohol intoxication detection system. Hardware components included: Raspberry pi loaded with Raspbian-operating system, USB camera-8 megapixel digital, Alcohol sensor, ARM processor, Relay circuits, Buzzer & Bluetooth are interfaced with Arduino UNO, Cell phone detector, Tilt sensor/vibration sensor, Fingerprint sensor. Software tools used: Open CV, Arduino suit, Embedded C, Python. Fig. 2 Shows the parameters used for detecting Driver's Drowsiness/ fatigueness. The Work is explained below

#### a. Fingerprint Authentication

- Fingerprint sensor is used for bio-metric verification.
- The fingerprint of vehicle's driver is taken by this device before the starting of the vehicle.
- If vehicle's location is changed without fingerprint verification, the system will consider that something is going wrong. Then the GPS engine will collect the co-ordinate of that place and send SMS to cell phone number of the owner of that vehicle.

#### b. Road Accidents Detection

- This system is designed for accident detection and reporting is based on tilt sensors and Raspberry pi. When vehicle meets an accident, at that time the accident will be detected by accelerometer.
- Micro electro mechanical system (MEMS) accelerometer sensor can be used as a crash detector of vehicle during and after crash. During that time vibration sensor is used as alarm application to gain attention of concerned towards accident location.

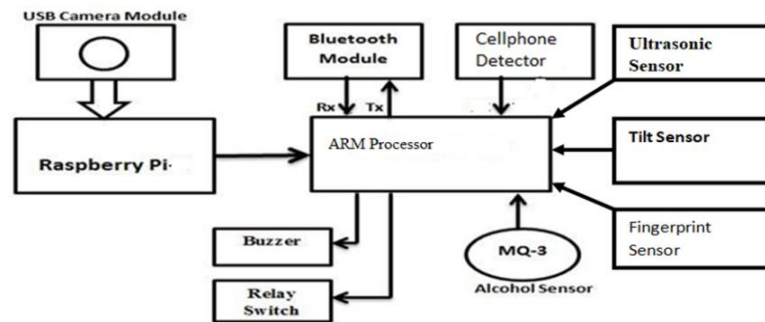


Fig 1. ARM Processor Based Alcohol intoxication detection system

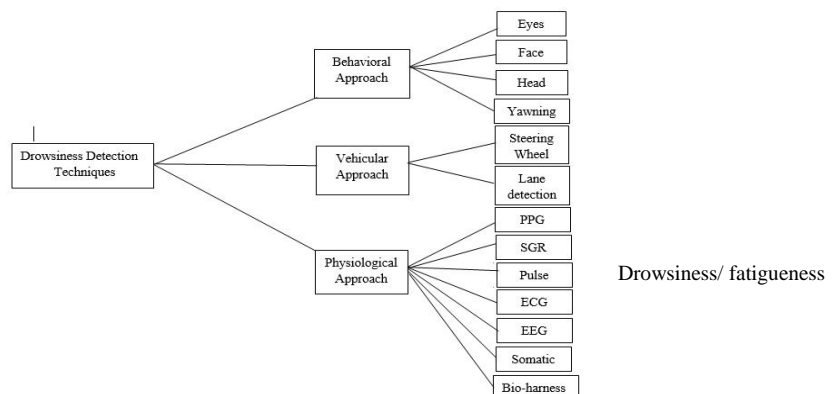


Fig 2. Parameters used for detecting Driver's



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## IV. METHODOLOGY

The results are obtained to achieve the objectives of driver's drowsiness detection and alcoholic intoxication. In this work we classify the drowsiness detection based on 3 categories such as behavioural parameter, vehicle parameter, physiological parameter. Firstly, system detects the face of the driver to judge the drowsiness of driver. Fatigueness is the major reason for road accidents. So in order to avoid accidents this system locates and tracks the mouth of the driver. Here we have used a camera which detects the facial expressions of the driver. We have also used eye blink monitoring method to determine the drowsiness of the driver, it receives the video from device and converts into frames. After the identification of face, eyeblink detection technique is applied. Image is captured by camera and we have also used alcohol sensor which detects whether the person has consumed alcohol. Buzzers are used to alert the driver, if the driver is found drowsy then alarm will be buzzed on and it pulls over at the left of the road automatically.

In this section results are obtained using software and hardware platforms to achieve the objective of driver drowsiness detection and alcoholic intoxication. OpenCV is the free source open software, which is used for developing computer vision. It is available in C, C++, Python and Java programming languages extension. In case if driver is in sleepy or finding fatigue, the message will be sent by using GSM and buzzer will be turned on. It is a machine learning based and positive image is used for detecting face and eye region. On the other hand of the system Arduino is used to detect samples of the driver who is driving is drunk or not. Based on the output from arduino, an alarm will be turned on and the car's ignition power source can be cut down through a relay to stop the car or preventing the driver to start the car. Cell phone ring detector used here to detect cell phone usage during the driving and warn the driver to restrict driver not to use mobile while driving. When the driver is drowsy/drunk, motor of the vehicle start to reduce and come to off state. Image is captured by the USB camera connected to raspberry-pi. These images are stored on SD card of raspberry-pi. Any interruptions are occurred then the IR sensor senses and gives information to raspberry-pi, to stop the vehicle and SMS is sent to authorized person or owner with the location.

## V. IMPLEMENTATION

The software, we've got used is OpenCV for face recognition in which the eyes and mouth can be detected. And if the driver is observed drowsy then mechanically buzzer will turn on and this alerts the driving force. In hardware, we've got used Arduino Uno, buzzers, IR sensors, alcohol sensor and Zigbee. Here Arduino Uno is a microcontroller board based at the ATmega328. It has 20 digital input/output pins of which 6 may be used as analog inputs, a 16MHz resonator, USB connection, a strength jack, an in-circuit gadget programming header and a reset button. An Infrared sensor emits or detects infrared radiation to sense its surroundings.

An Alcohol sensor detects the attentiveness of alcohol gas inside the air and an analog voltage is an output reading. Buzzer is a sound because of the inner oscillating circuit present interior it. Zigbee generation helps the transfer of records coming from the sensors at a fee of approximately 250kbps.

## VI. CONCLUSION

This system provides details of behavioural, transport and physiological parameters based mostly for sleepiness detection of the motive force. Their non-intrusiveness will be reducing victimisation wireless sensors on the driver's body, driving seat, seat cover, wheel etc. Hybrid of those techniques like physiological measures combined with transport or behavioural measures helps in overcoming the matter related to individual. therefore results improved sleepiness detection.

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