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## VEHICLE BLACK BOX SYSTEM

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### ABSTRACT

A person faces several problems due to accident when he is inside vehicle. Many lose their lives in these incidents. Here we will use sensor networks to avoid such incidents. The person who is inside the vehicle will get the security by sensors. The accidents are reduced which are caused due to unreliable problems, by using technologies like wireless communication for sensor networks. The devices which uses mobile communication are used by the owner of the vehicle to connect with positioning system, to get the location of accident. The use of the sensor network is not only limited to providing security but also to check the condition of vehicle in various situations such as leakage of gas or accidents due to fire. The individual values from sensors are used to calculate the results which appears on display unit. Apart from providing security and avoiding the accident, this project helps in dealing with alcohol detection and drowsiness of driver.

**Keywords:** Vehicle Black Box, Wireless Sensors, Cloud, IoT Technology

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### 1. INTRODUCTION

Science is making amazing advances to provide a huge number of advanced [1] cars in this modern world. The cars are advanced than before and the speed is also more. There is a need to go with devices which can monitor continuously the different parameters of the car. The design which we have will record all the parameters in case of accidents and which will help us to prevent such accidents in future to the [2] maximum extent. This project is developed to get informational data like engine temperature (before 30 sec), level of alcohol, leakage of gas etc. reform the data about motor vehicle accident investigation. This will also be used for mapping of vehicle and alert about accident by using GSM and GPS technologies. The details of the vehicle which met accident will be sent to the nearby rescue team for immediate help. [3] The satellites used for communication will locate and transmit the signals globally around the clock. [4] The latitude and longitude along with altitude value will be calculated by using the GPS receiver. The features of this project are detecting leakage of gas, temperature of engine, detection of alcohol, car location using global positioning system, and the recorded data on a memory device. The current details of the car can be sent to the dedicated mobiles using GSM technology.

#### Objective of this work:

- GPS module system will be helpful in finding the accident location and take quick rescue operations.
- We can enhance the present system to check other parameters like fuel level, tyre pressure and working of vehicle.
- With help of alcohol sensor we detect the alcoholic person,
- Many critical parameters can be read and stored in the memory.
- Another useful add-on to the present system could be cameras on front and backsides which keep recording live images and storing them in memory.
- This video data would be much useful for accident investigation

#### Applications:

The focus is to alert the driver from the situations of collisions and the services from cloud computing to trace the location in a easy way.

The low power micro-controller proposed here can be used in hardware implementation as its main controller for automation of the device, with the support of IoT and cloud computing technologies. The intelligent vehicle black box

- Our contribution is that we proposed a low power micro-controller which can be used in the hardware implementation as its main controller in the automation of this device. with the meaningful support of the Embedded systems, IoT and Cloud computing, we strongly believe that Intelligent Vehicle Black Box using IoT will be reliable, power efficient in the real time applications.
- The GSM and GPS modules can be used in future to decrease the power by integrating with hardware and a rechargeable battery which will provide the charge to the device for longer time.
- Eye blinking sensor is use to avoid drowsiness during driving.

## 2. LITERATURE SURVEY

### 1. Vehicle accident prevent cum location monitoring system

**Author:** Abhirup Das ; Abhisek Ray ; Abhisek Ghosh ; [4] Swarasree Bhattacharyya ; Debaleena Mukherjee ; T. K. Rana

**Publication:** 2017 8th Annual Industrial Automation and Electromechanical Engineering Conference (IEMECON)

**Abstract:** Accidents on road increasing day by day at a faster rate. Accidents can be avoided by knowing the psychological state of a driver. Major accidents usually occur during night which will be due to [5] drowsiness of the driver of the vehicle. Eye blinking of the driver can be monitored to reduce such accidents; the drowsiness can be understood by the blinking of eye. [6] And drowsiness will also take away the concentration of driver from any obstacles located on road. [7] And blinking of eye will even help in knowing the drunken state of the driver as well. The above alarm condition is activated by using the automatic pre-cautionary system

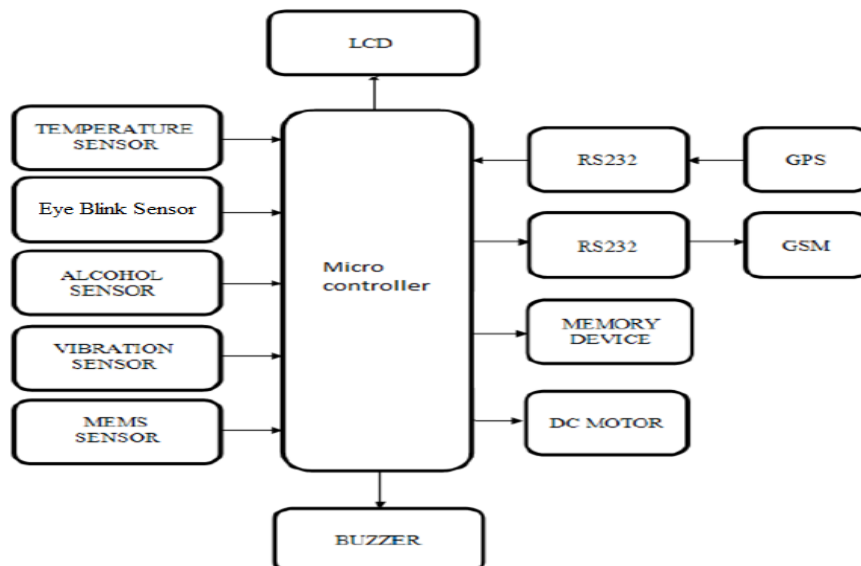
### 2. Design and implementation of an eye blinking detector system for automobile accident prevention

**Author:** Tariq Jamil ; Iftaquaruddin Mohammed ; Medhat H. Awadalla

**Publication:** SoutheastCon 2016.

**Abstract:** we can reduce the increasing number of traffic accident [8] around the world significantly if we incorporate modern technology within the automobile. The physical condition of the driver can be accessed at regular intervals automatically and take the preventive measures during the movement of the vehicle for the safety of all concerned entities, both within the vehicle and outside the vehicle. Here the design of an eye blinking detector system is presented which can monitor the physical state [9] of the driver at regular intervals during his/her driving and, if needed, can raise an audible alarm within the vehicle to alert the driver or initiate application of vehicle's braking system.

## 3. ARCHITECTURE



The diagram below shows how we can make this proposal work along with other peripheral devices. The sensors for different purposes are used like to read and collect the data for [10] different purposes like an evidence if there is any legal issue. The RISC architecture based ARM processor are used. And this implementation consumes a very low power.

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## 4. METHODOLOGY

In today's [12] world to reach workplace, [13] to deliver goods, to meet a family or friends we need an automobiles. Unfortunately many a times it results into disasters. Accidents are unplanned and unforeseen events with unplanned circumstances, which usually lacks intention or necessity as per the Wikipedia. Even though accidents happen quite often, they are the most unwanted thing to happen to the road user. The users of road are well aware of rules and measures for safety while using road but usually [14] they don't follow the rules strictly, [15] which is the main reason for accidents and crashes. Human errors are main reasons for accidents and crashes.

Few of the reasons which we find are:-

- Driving with Over Speed
- Drinking and Driving
- Disturbances to Driver
- Signal jumping
- Avoiding Seat belts and Helmets
- Non-adherence to lane driving
- Overtaking in a wrong manner.

The accidents are detected by using Vibrations along with use of the Sensor and the Accelerometer.

The GPS provides the location details and information [16] of the exact Accident time.

### 4.1. SYSTEM REQUIREMENTS

Implementation of project is executed in two ways:

- Hardware Requirements Microcontroller, GPS receiver, Message module, LCD display, Vibration sensor, Temperature sensor, MEMS Sensor, Power supply, Eye Blink Sensor.
- Software Requirements Embedded C/Python, Noobs OS, Arduino IDE.

### 4.2. ADVANTAGES AND DISADVANTAGES

#### ADVANTAGES:

- It could make you a better driver.
- Evidence if you are in an accident.
- You can find your car if it's lost or stolen.
- It could save you money.
- It can detect if you have had an accident.
- Your data is always private and secure.
- It's discreet and won't devalue your car.

#### DISADVANTAGES:

- Technology and monitoring costs may outweigh potential revenues
- Without clear and concise specification test cases are hard to design
- Always required power supply

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## 5. CONCLUSION

The rise in use of IoT technology is helping to avoid many issues in the modern world. Our focus here is to alert the driver from accidental situations and the current location can be traced with the help of cloud computing services very easily. We are using hardware which is a low power micro-controller; this is the main device which controls the automation.

The support of cloud computing, IoT will be making the intelligent vehicle black box very reliable and power efficient in various real time applications. The GSM and GPS modules can be used in future to decrease the power by integrating with hardware and a rechargeable battery which will provide the charge to the device for longer time.

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