# Black Box for Car

**Prof.T.V.Kafare[1], Kiran Kawade[2], Sapana Sonavane[3], Arundhati Sude[4]**

[1, 2, 3, 4]

Dept of E & TC Engineering

[1, 2, 3, 4]

JSPM's Bhivarabai Sawant Institute of Technology & Research, Wagholi, Pune

*Abstract-*

 The collection of the real time data after the detection of collision around the vehicle environment and analyze the collected data to have the conclusion regarding the collision and simultaneously transmitting the data over the wireless network. The Evidence Collection System is vehicle based device which is use to collect the data like speed, engine temperature, Brake status, LPG sensor, Alcohol content, acceleration, GPS position, wiper movement, and time etc. This data can be used to investigate the crime, rescue operation and insurance claims. This data then transmitted to the database server so that web application can be able to access this information at different places like police station, Insurance Company. In this paper, I am going to investigate the use of evidence collection system by using different sensors and wireless communication.

*Keywords-* Ardunio, Alcohol Sensor, Pressure Sensor, Temperature Sensor, GSM, GPS.

## I. INTRODUCTION

The vehicle accident is a major public problem in many countries, particularly India. Despite awareness campaign, this problem is still increasing due to rider's poor behaviors such as speed driving, drunk driving, riding without sufficient sleep, etc. The numbers of death and disability are very high because of late assistance to people who got the accident. These cause huge social and economic burdens to people involved. Therefore, several research group and major motorcycle manufacturers have developed safety devices to protect riders from accidental injuries. However, good safety device for vehicles is difficult to implement and very expensive. On the roadway driver usually keep a safety distance from one another. On the other hand, due to the driver's interruption, long-time driving tiredness, or a sudden break applied by another car, a serious collision may occur. Even though the driver is in a conscious mind, he cannot respond immediately to control his/her vehicle. Sometimes crash may occurs due to bad weather situations as mist, vapor, fog and so on. Like Black Box of airplane, Car Black Box (known as Event Data Recorder) is used to record information related to accidents. Car black box records driving data, visual data, collision data and position data before and after the accidents so that it can be used to analyze the accident easily and to settle many disputes

related to car accident such as crash litigation, insurance settlements. It can be used to not only reconstruct what happened before an accident by Insurance agents and police but improve vehicle design, roadway design and emergency medical service by automakers, government and hospital. In addition to the basic function, the car black box equipped with Wireless communication system can send accident location information to central emergency and disaster server in real-time. Therefore drivers who want help can receive service quickly by rack car, police and hospital ambulance. Car Black Box detects a crash automatically, and also records the motion of the vehicle and driver's actions during a predefined time period before and after the accident. It consists of data collection devices for collecting the information about car's status and the driver's actions, a nonvolatile memory device for recording, a microprocessor for controlling the unit and a wireless modem for communication.

## II. LITERATURE SURVEY

**P. Ajay Kumar Reddy 1, P.Dileep Kumar 2, K. Bhaskar reddy3, E.Venkataramana 4, M.Chandra sekhar Reddy 5,** *"Black Box For Vehicle" A Review on paper International Journal of Engineering Inventions ISSN: 2278-7461, www.ijeijournal.com Volume 1, Issue 7(October2012) PP: 06-12*

This research paper present "the black box system draws the first step to solve problem. Like flight data recorders in aircraft, "Black Box" technology can now play a key role in motor vehicle crash investigations [4]. A significant number of vehicles currently on the roads contain electronic systems that record in the event of a crash. That is why it is so important to have recorders that objectively track what goes on in vehicles before, during and after a crash as a complement to the was used. Subjective input that is taken usually from victims, eye witnesses and police reports. This system is mainly committed to two sections. The first one is how to detect and collect the information from the vehicle. The second is how to present the data to the user in a simplified way. To implement the first section many components and various types of sensors are used.

**Miss. Ashwini B. Patil1, Dr. Suresh D. Shirbahadurkar2, Mrs. Vaishali V. Thorat3** *"Review Paper on Study and Literature Survey for Evidence Collection System for Car" International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 4, April 2016*

In this paper, The collection of the real time data after the detection of collision around the vehicle environment and analyze the collected data to have the conclusion regarding the collision and simultaneously transmitting the data over the wireless network. The Evidence Collection System is vehicle based device which is use to collect the data like speed, engine temperature, Brake status, LPG sensor, Alcohol content, acceleration, GPS position, wiper movement, and time etc. This data can be used to investigate the crime, rescue operation and insurance claims. This data then transmitted to the database server so that web application can be able to access this information at different places like police station, Insurance Company. In this paper, to investigate the use of evidence collection system by using different sensors and wireless communication.

received is decrypted and the fed to the server machine so as to store the data to the database. Then the web application developed can be deployed on web server which will use this collected information to generate the reports. The conclusion can be generated logically which can be made available on internet with very less time which can be further use by accident investigation, insurance claim and hospitals for handling emergency situations. Analyze the accident easily and to handle many problems related to car accident like crash litigation, insurance settlements etc.
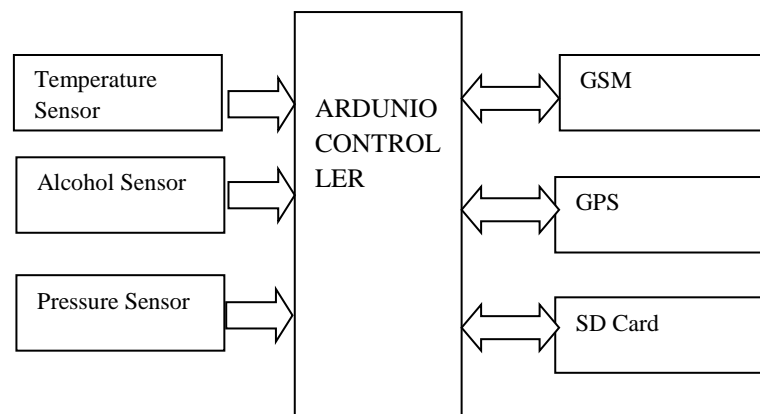
### III. METHODOLOGY

In first case the data is coming to the input port of the controller which will continuously get the data. When the collision is detected by collision sensor the incoming data to the input port of the controller will be saved to the memory device connected to the system while transmitter connected to the output port of the controller will simultaneously transmit the data to the wireless network

1) Driving data: Driving information such as speed, brake and seat belt status, steering performance is taken.

2) Collision data: Time, speed and shock power when accident occurs is taken from accelerometer.

3) Positioning data: The car positions checked in real time by GPS. These data are saved temporarily in RAM as memory buffer and transfer to the Flash memory like SD card.

In second case, at receiving end the collected data after the collision will be received by the antenna. The



**Fig.1Block Diagram of Black Box for Car**

In third case, Wireless communication: The proto type can be designed to get the actual output. The data can be collected using the different sensors connected. The Web application can be designed on.

### IV. HARDWARE RESOURCES

The hardware part consists of the components and the sensors used in the black box system. This part mainly collects the status of the sensors and stored.

A.  ARDUINO Controller

Arduio is open source computer hardware and software company project, and user community that designs and manufactures single board microcontroller kit for building digital device and interactive objects in the physical world. The projects product are distributed as open source hardware and software ,which are licensed under the GNU Lesser General Public License (LGPL)

Or the GNU General Public License(GPL) ,permitting the manufacture of Ardunio boards and software distribution any one.



Fig.2: Ardunio Controller
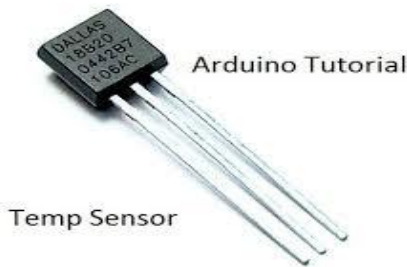
B.   Temperature Sensor



Fig.3:Temprature Sensor

Engine temperature is important in engine control unit, if this value goes to abnormal, some unwanted gases exhaust from vehicles due to improper combustion. In this project, in order to obtain the vehicle engine temperature, we have used LM35 temperature sensor. This temperature sensor continuously reads the engine temperature and fed to the microcontroller. The output of LM35 is given to LPC2148. It converts temperature value into electrical signals. Its temperature sensing range is -55 to +150°C.

*C. Alcohol Sensor*



Fig.4:Alcohol Sensor

In this, MQ-3 gas sensor is used for alcohol detection. It is high sensitive to alcohol, simple drive circuit, stable and long life. If driver has drunk, then alcohol sensor sends signal to microcontroller. The output of MQ-3 is given to Ardunio and message is displayed on mobile.

D. Pressure Sensor



Fig.5:Pressure Sensor

A pressure sensor is a device for pressure measurement of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed. For the purposes of this article, such a signal is electrical.

Pressure sensors are used for control and monitoring in thousands of everyday applications. Pressure sensors can also be used to indirectly measure other variables such as fluid/gas flow, speed, water level, and altitude. Pressure sensors can alternatively be called pressure transducer, pressure transmitter, pressure indicator etc.

E.GSM

Fig.6:GSM

GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine- SIM 900A, works on frequencies 900/ 1800 MHz. The Modem is coming with RS232 interface, which allows you connect PC as well as microcontroller with RS232 Chip(MAX232). The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer application in M2M interface. The onboard Regulated Power supply allows you to connect wide range unregulated power supply . Using this modem, you can make audio calls, SMS, Read SMS, attend the incoming calls and internet ect through simple AT commands.

F.GPS



Fig.7:GPS

This board features the u-blox NEO-6M GPS module with antenna and built-in EEPROM. This is compatible with various flight controller boards designed to work with a GPS module. Specifications. Power Supply Range: 3 V to 5 V; Model: **GY**-GPS6MV2; Ceramic antenna; EEPROM for saving the configuration data. The Global Positioning System was conceived in 1960 under the auspices of the U.S. Air Force, but in 1974 the other branches of the U.S. military joined the effort. The first satellites were launched into space in 1978. The System was declared fully operational in April 1995.The Global Positioning System consists of 24 satellites, that circle the globe once every 12 hours, to provide worldwide position, time and velocity information.   GPS makes it possible to precisely identify locations on the earth by measuring distance from the satellites. GPS allows you to record or create locations from places on the earth and help you navigate to and from those places. Originally the System was designed only for military applications and it wasn't until the 1980's that it was made available for civilian use also.

## V.  WORKING PRINCIPLE

The working our project is that when any car comes and dashes to our own car the pressure sensor detects the pressure and value increases above the threshold value and the SMS is send through the GSM located inside the circuit. Similarly about alcohol sensor when the driver is drunk the sensor sense the smell and the value increases above the threshold value and again the SMS is send to the owner, insurance company and the police. GPS is used to give the location of the accident place which is helpful for the hospital people to get the accident location as soon as possible.

## VI. Result

The result of car black box is the values of sensor i.e. if driver drinks and drive the value of alcohol sensor sense the smell of alcohol and gives the value above the threshold value and as there is change in the value the GSM sends the message to the numbers feed into the program. Same is with the other sensors.
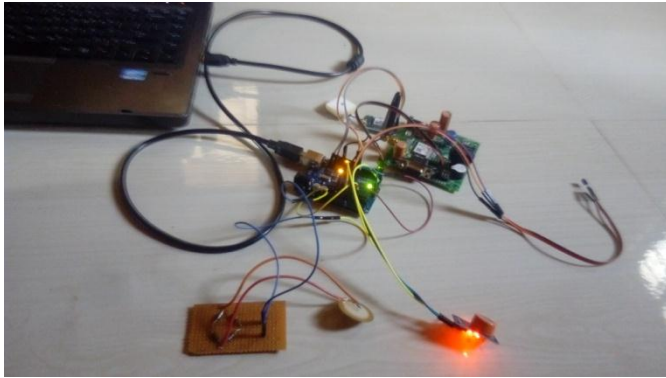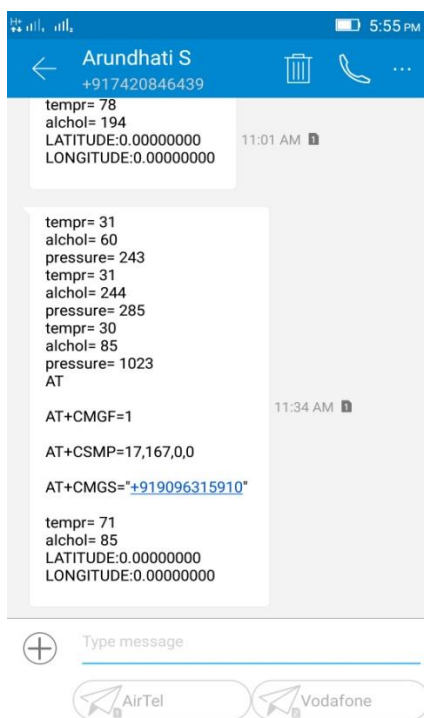
Fig.8:Hardware of Black Box for Car



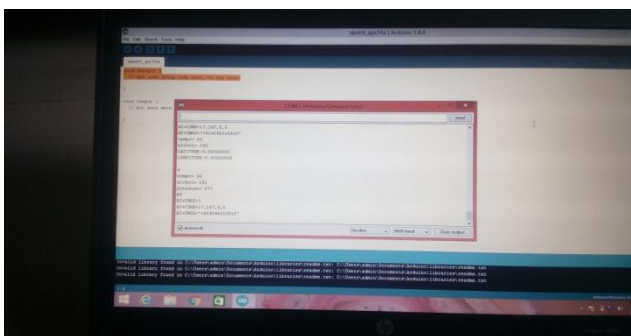Fig.9: Output on the send the value of mobile



Fig.9: Output on the laptop

## VI. Conclusion

Thus main objective of the proposed work of developing a prototype of Black Box For vehicle diagnosis that can be installed into any vehicle. This prototype is designed with minimum number of circuits. This contribute to construct safer vehicles, improving the treatment for crash victims, helping insurance companies with their vehicle crash investigations, and enhancing road status in order to decrease the death rate. The collection of the real time data after the detection of collision in an around the vehicle environment and analyze the collected data to have the conclusion regarding the collision while simultaneously transmitting the data over the wireless network.

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