Automobile Monitoring Tool

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Abstract—the primary reason for the paper is to build up a model of Black Box For vehicle finding that can be introduced into any vehicle to track its operations. This model can be planned with least number of sensors and circuits with minimal effort so that everybody can bear. This can add to build more secure vehicles, enhancing the treatment for accident casualties, helping insurance agencies with their vehicle crash examinations, and improving street status keeping in mind the end goal to diminish the death rate due to accidents, tracking the exact location of the car. The ignition secret key framework introduced operating at a profit box will anticipate taking and thefts of autos. Data from these black box can be gathered after an accident and broke down to figure out what the vehicles were doing some time recently, amid and after the accident or occasion.

Keywords—black box; event data recorder; GPS; GSM;Infrared

I. INTRODUCTION

As indicated by the World Health Organization, more than a million people on the planet pass on every year on account of transportation-related accidents. With a specific end goal to respond to this circumstance, the discovery framework attracts the initial step to tackle issue. Like flight information recorders in flying machine, "Discovery" innovation can now assume a key part in engine vehicle crash examinations. A noteworthy number of vehicles right now on the streets contain electronic frameworks that record in case of an accident. That is the reason it is so critical to have recorders that dispassionately track what goes ahead in vehicles some time recently, amid and after an accident as a supplement to the was utilized. Subjective info that is taken normally from casualties, onlookers and police reports. This framework is basically dedicated to two segments. The first is the means by which to recognize and gather the data from the vehicle. The second is the manner by which to show the information to the client in a much simplified manner. To execute the primary segment numerous segments and different sorts of sensors are utilized which helps as a part of recording the information as well as recovering the information from microcontroller memory to a LCD screen to show it. Keeping in mind the end goal to know which kind of sensors to be introduced into the vehicle different sorts of exploration are done and taking after ones are considered as the most essential information that is required after the mischance: Belt status, Break status, Lane identification and CAN failures.[1]

To prevent stealing of vehicle's, ignition password system is installed on the black box [2]. He/she have to enter the correct password to ignite the engine thus decreasing the probability of robbery.

II. IMPORTANCE OF PROPOSED MODEL

The car black box is a vehicle-based recorder .These data can be used for accurate car accident investigation and some public crimes prevention. The system demonstrated in this model will result in the reduction in the number of accidents .Car black box tracks what goes on in vehicles before, during and after a crash. . It include the ability to collect statistically relevant crash information and to allow immediate notification of an accident to emergency personnel.

There is additionally another kind of auto secret elements, otherwise called data event recorder which are utilized by the drivers intentionally. These are introduced on the windshield and highlight a camera and in addition a GPS unit and gathers the execution information, for example, quickening, braking and turning. The information is put away naturally to a safe advanced (SD) card like those that are utilized as a part of computerized cameras and can be inspected on a PC. This sort of auto secret elements is considerably more precise than those that are as of now being introduced in vehicles since it likewise records the time, area and bearing of the driving and in addition the driver's perspective which makes it extremely accommodating for various difficult to-demonstrate circumstances, for instance when attempting to demonstrate that you drive through yellow not red lights.

With the assistance of the same microcontroller we can digitalize every one of the parameters in dashboard. In a matter of seconds, simple meters are utilized as a part of vehicles to show the pace, separation voyaged, fuel level and so forth. The fundamental hindrance of utilizing simple meters is that it is not exact. The advanced dashboard shows all information gathered from sensors utilizing a 16x2 LCD. The framework additionally cautions the client about the data like low fuel level, over rate, high motor temperature, through drove or ringer sign. A Ultrasonic sensor is additionally connected to the framework for crash evasion which produces ready cautioning at whatever point any hindrances comes extremely close to the vehicle, accordingly decreasing the likelihood of meeting a mischance.

The system consists of conjunctive components of an accelerometer, microcontroller unit, GPS device and GSM module. In the event of accident, this wireless device will send mobile phone short massage indicating the position of vehicle by GPS system to the registered mobile number.

It's looking very likely that a bill is going to pass that will make mandatory use of the car black boxes, and here are the 15 required rules as per the law:

- Change in forward crash speed at the time of accident

- Maximum change in forward crash speed at time of accident.

- Time from beginning of crash at which the maximum change in forward crash speed occurs at the time of accident.

- Speed vehicle was traveling during accident

- Percentage of engine throttle, percentage full (how far the accelerator pedal was pressed)

- Detects whether or not brake was applied during the accident.

- Ignition cycle (number of power cycles applied to the EDR) at the time of the crash

- Ignition cycle (number of power cycles applied to the EDR) when the EDR data were downloaded

- Whether or not frontal airbag warning lamp was on during the time of accident.

- If the driver was using a seat belt or not.

- Driver frontal airbag deployment: time to deploy for a single stage airbag, or time to first stage deployment for a multistage airbag

- Right front traveler frontal airbag organization: time to send for a solitary stage airbag, or time to first stage arrangement for a multistage airbag

- Number of times the vehicle was crashed.

- Time between first two crash events, if applicable

- Whether or not EDR completed recording

- Consider the situation when there is an accident, we propose a system where car itself intimates the concern emergency service for immediate reaction in case of accident or any emergency situation.

- Consider another scenario where a thief is trying to steal your car which is parked at some remote distance. The remote monitoring system (GSM and GPS) which is connected to the system can be used to stop the car engine or can take any immediate action to save the vehicle.

Advantages

• It will send immediate reaction in case of accident & vehicle security breach or any emergency situation.

• It will help to find out the exact position of the vehicle (tracks the location of the vehicle via the coordinates send through GPS and GSM controllers).

• Low cost solution and easy to install in any type of vehicle.

• Accident Surveillance

• Prevents thieves from stealing our car.

III. METHODOLOGY

The Black box or Event Data Recorder (EDR), records information about your vehicle. It records speed, temperature of the engine, distance travelled, status of fuel level, location information and more. It include the ability to collect statistically relevant crash information and to allow immediate notification of an accident to emergency personnel.

The EDRs store the information from different sensors on an External EEPROM until recovered from the module whereas embedded C programming is used to retrieve that data collected from the sensors. Different types of sensors used with the model are as follows-

Proximity Sensor a proximity sensor is used to detect the lanes in which the vehicle is travelling. A proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact.

Ultrasonic sensor the ultrasonic sensor is to measure the minimum distance in front of the vehicle Ultrasonic sensors work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively.

Pressure Sensor A pressure sensor measures pressure and is mainly used to find whether an accident has occurred or not and to detect the impact cause as a result of the accident.

Temperature Sensor This sensor is mainly used to detect the temperature of the engine of vehicle. It detects two types of temperatures one is abnormal temperature and other is engine temperature.

IR sensor for Reverse Parking & Back Camera: An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion.

KEYBOARD: This keypad is used to secure the vehicle from any unauthorized access. As shown in the figure, the driver uses the keypad to enter the correct password. The entered data is processed by the controlled circuit, which compares the entered data with the stored password in the memory.

GSM: is a digital mobile communication system that is used all around the globe for all mobile based communications.

GPS: used to track the location of the vehicle.

Project also implements a vehicle security system with the help of magnetic sensor and GSM modem. When vehicle is trespassed, the system will alert the user by sending SMS.

The following figure demonstrates the various components which are installed in the car black box model.
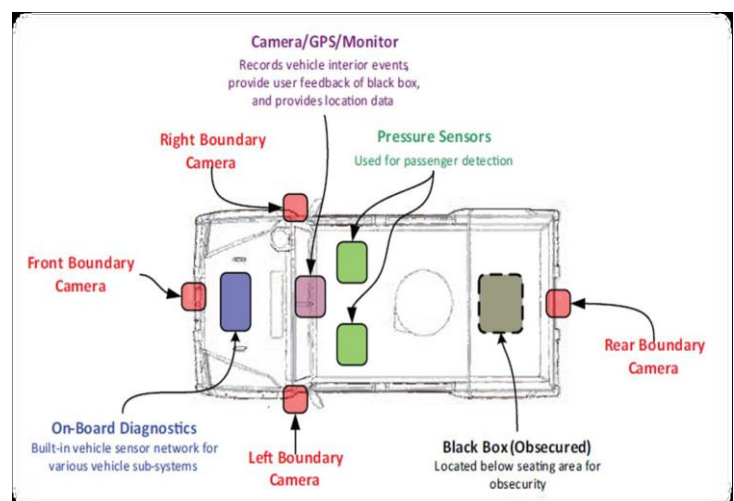

Fig. 1 Various components inside the black box model

FEATURES:

- On-screen LCD for speed, distance covered, fuel level, engine temperature and mileage.

- Secure your car from any unauthorized access by password protection.

- Prevent Crashes By the use of Ultrasonic sensor.

- GSM and GPS technology incorporated for accident alert.

- Improved Productivity.

- Control Driver Performance.

- Provide Key Management Reports.

When the IGNITION is ON it has to initialize the LCD. Then it displays the message WELCOME for Vehicle Diagnosis. Later it waits for the driver to enter the correct password and an IGNITION Key. This key represents the start of the vehicle and the password protects your vehicle. Then it check for the entered password to be correct, if not it gives 2 more tries to the driver to enter the correct password. If the driver fails to enter the correct password even in the 3rd try, the buzzer alarm is activated and a warning message is send to the registered driver's number. After the correct password and ignition it checks for the critical parameters like BRAKE, SEAT belt and GSM. When all these conditions are passed then only the DC Motor gets started otherwise it displays Failure message.
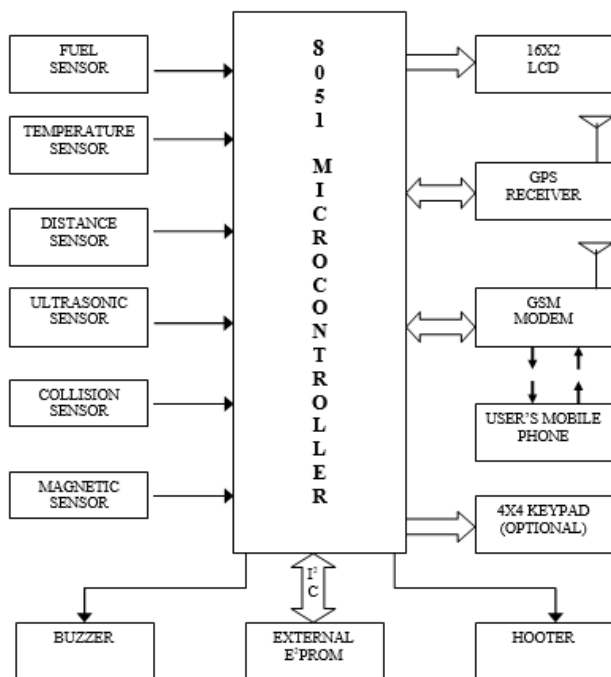
FUTURE SCOPE OF WORK

Utilization of GPS module with this framework will be useful in finding the mishap area and take fast protect operations. We can improve the present framework to check different parameters like fuel level, tire weight and working of headlights before beginning the vehicle. With the usage of LI-FI, LI-FI empowered drove would be introduced in the vehicles' light which would help in auto pilot, movement administration. Numerous other basic parameters can be perused and put away in the memory. Another helpful extra to the present framework could be cameras on front and rears which continue recording live pictures and putting away them in memory. This video information would be much valuable for mishap examination.

Later on we can make a portable or desktop application which can be utilized to control the auto, initiates ringer and hooter, turn off/on the motor from a remote area. This would be extremely valuable in circumstances at whatever point a cheat tries to take our auto. Some additional sensors [door sensor, ignition sensor] could be added to the entryways which will anticipate unapproved access to the vehicle.

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Fig. 2 basic architecture design inside the black box.