Review on Implementation of Evidence Collection System For Vehicle : BlackBox

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Abstract : This paper provides a practical and affordable way for gathering real-time vehicle data and archiving it for later use. This study presents the design and implementation of an Arduino Uno ATmega328 microcontroller-based black box system for a car. The Arduino Uno ATmega328 microcontroller and several sensors, such as a GPS, GSM module, ultrasonic sensor, temperature sensor, seat belt sensor, and EPROM, were used in the construction of this system. It makes use of a Global Positioning System (GPS) module to get the vehicle's current location and a Global System for Mobile Communications (GSM) module to send the owner or user a short message service (SMS) containing the vehicle's current location at the moment of an accident. Any GPS visualizer, such as Google Maps, can be used to see the movement of the car based on the data that is recorded in EPROM from the sensors and modules.

Keywords: sensors, GPS, GSM, Arduino Uno ATmega328, black box.

I. INTRODUCTION

The World Health Organization (WHO) reports that accidents involving transportation claim the lives of over a million people worldwide each year. In order to solve this issue, the car black box assumes the function of the investigator to ascertain the reason and then aids in suggesting safety precautions. In 200 days, there were over 1.3K accidents on Samruddhi! 95 people lost their life in an average of 6 accidents per day. Over six accidents per day have occurred in the 201 days between December 11 (the day the express lane opened) and July 1. 1,287 accidents have resulted in the deaths of 95 persons thus far.

A. **MAHAMARGA SAMRUDHI VNIT STUDY:** "Human error" is the primary cause of expressway accidents.

It was alarming to learn from a significant study conducted by the Visvesvaraya National Institute of Technology (VNIT), Nagpur, that there are no stops of any kind on the Super Expressway, including gas stations, restaurants, restrooms, shopping centers, entertainment venues, etc. Students have asserted that drivers tend to experience "highway hypnosis" following extended periods of driving without a rest, which can result in accidents. "Highway hypnosis" is the term for the state in which a driver loses consciousness while operating a vehicle, is unable to recall what happened at that particular time, continues to drive without complete control over the steering, and pays no attention to anything in the environment. Four students from Visvesvaraya National Institute of Technology (VNIT) recently completed a study that found four main causes of deadly accidents on the Samruddhi Mahamarga. Tire burst, lane changes, boring driving, and animal crossing are a few of these.

In accordance with the Council for Protection of Rights (CPR) mentioned above. Additionally, there is no definitive conclusion to the VNIT research on the accidents at Samruddhi Mahamarg. What specifically caused the accidents? This comment raises concerns about the users' attitude. We therefore wish to put into practice the concept of a vehicle black box, which records information prior to the specifics of any collision and aids in the analysis of accident-related data.

In order to solve this issue, the car black box assumes the function of the investigator to ascertain the reason and then aids in suggesting safety precautions. The insurance firms receive assistance from the system in the settlement of their claims. An electronic device used specifically for recording and storing information is called a "black box". The car black box is a device that records data about the vehicle, including engine temperature, obstacle presence, and the precise site of the collision. A car's black box captures the driver's activities and the vehicle's motion in addition to automatically detecting crashes. It is made up of data gathering apparatuses that gather data regarding the condition of the vehicle and the driving behavior of the operator. In addition to providing objective tracking of vehicle events for accident analysis, the car black box notifies traffic headquarters of the crash, the location of the vehicle, and any recorded details. Emergency medical services also receives notification of the crash and its location, enabling them to administer first aid as soon as possible. Additionally, it notifies family members about the collision and the location of the vehicle in a brief message.

The project's primary goal is to reduce the number of accidents worldwide in real time, and in the event that an accident does occur, to recover quickly, enhance the likelihood that the injured will survive, and lessen the severity of their injuries. This expedited the time needed to help the injured person by automatically deploying the necessary actions.

The following are some uses for Car Black-Box:

1. Better crash research that could lead to safer road designs, better driver education programs, and increased highway safety.

2. Collision data for study, data to enhance both internal and external vehicle design.

3. Should not only capture pertinent data but also attempt to avert a potential collision by restricting the vehicle's speed in regions where accidents are likely to occur.

4. Wireless communication via GSM-enabled transmission of the time and location coordinates as well as a warning message in the case of a collision.

B) "Tech To Guarantee Zero Mishaps On Samruddhi"

Nagpur: On Friday, PWD Minister Dada Bhuse stated during a visit to the Samruddhi highway that the government would employ technology to guarantee there are no accidents. The minister talked about ways to lower the rising number of accidents on Samruddhi Mahamajarg with representatives from MSRDC and other organizations.

Amidst the ongoing assembly session in Mumbai, the state government dispatched Bhuse on a Samruddhi visitation. The action was taken in response to a June 30 accident that left 25 passengers in a private bus fatally burned. Legislators from Vidarbha and other areas have expressed concern over the rising toll of highway deaths. This path has been planned for the development of underdeveloped areas. Definitely one of the most significant freeways in the world.

"The hard work put in by the CM and deputy CM will pay off once it is operating at full capacity till Mumbai," Bhuse stated. Bhuse received analyses of several Samruddhi accidents from the officials. According to the minister, comparing accidents on Samruddhi and other routes would be unjust. Every day, around 20,000 cars travel along this route. Following today's inspection, some policy decisions would be made, to Bhuse.

When Bhuse visited Waifal post, where Samruddhi from Nagpur begins, he spoke with drivers and heard about their experiences. In an effort to stop the mishaps, he also asked them for guidance. It is the government's duty to ensure your safety. To preserve precious lives, every safety

measure would be done. I implore every driver to carefully abide with the traffic laws on this road," he continued.

The Samruddhi control room, fire prevention system, quick action vehicle, counseling center, and ambulances were examined by Bhuse, state transport commissioner Vivek Bhimanwar, MSRDC joint managing director Sanjay Yadav, and other officials.

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ABSTRACT: The Black Box was created to prevent millions of deaths from traffic accidents. Our project's primary goal is to create a "Black Box for vehicles" system that can be fitted in any kind of vehicle. This system can be built with the data required for more accurate accident analysis. In essence, it keeps track of the origin, the incidence, and the site of accidents. It gathers the data and reports back to the control room and driver with an analysis. Additionally, this system gives indications for the vehicle's indicator panel. Keywords—Accident switch, Android App, Blue

Buzzer, Green LED, Hall Effect sensor, Red LED, Touch sensor.

CONCLUSION:

An extremely helpful black box system for the automotive sector is presented in this study. A variety of sensors, including the steer touch sensor, the hall effect sensor, and an Android software with GPS/GSM and audio/video capabilities, are used to create an inventive black box. The system will start to record the parameters and display them on the LCD panel as soon as the driver takes control of the vehicledditionally, this technology alerts the driver when anything unexpected happens while operating the vehicle. In the event of an accident, a message detailing the location of the accident and the parameters captured at the time of the accident will be transmitted to the control room, along with a recording of the video from the scene. This black box design is quite helpful in resolving a lot of accident-related disputes.

DISCUSSION

The suggested system records the different driving data metrics by using a variety of sensors. These sensors are controlled by the Arduino controller. To gather the vehicle's location, the system makes use of external sensors like the Global Positioning System (GPS). In the event of an accident, the recorded data is saved and communicated via Short Message Service as an alarm message to family members, the head office, and emergency services. The position of the car and black box data, including temperature, seat belt usage, and vehicle speed, are sent to the central office.

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