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Automotive Based Smart Black-Box System Using IOT

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ABSTRACT: In General the black box system is used in aero plane to get the accident information for investigation purpose. In our proposed system the same black box technology implemented on the road vehicles. The important information like vehicle temperature, vibration occurs, driver alcohol consumes saved locally. And get all the information through the IOT. Autonomous vehicles require reliable and resilient sensor suites and ongoing validation through fleet-wide data collection. It discusses the composition and performance of a sophisticated controller system of automobile recording machine. The system cannot solely record the most driving information of the automobile comprehensively and accurately in period, however additionally re-construct the accident with information method code, it may facilitate folks analyse the accident quickly and lawfully when a collision. The SD card module is used to take a log of sensor parameters which is continuously monitored by a controller and the system will update the information whenever an abnormal system event happened. With finite storage, prioritized data recording discards low-value buffers to make room for new data. Further, no metrics have been established to optimize long-term data collection for on-road vehicles. Globally optimizing data compression and deletion decisions would require buffering all data over a long-term trajectory. Autonomous vehicles (AVs) require verification and validation (V&V) to minimize or eliminate the potential for incorrect perceptions, decisions, and actions. The industry has used the Naturalistic Field Operation Test (NFOT) project to collect a large amount of driving data and has conducted Monte Carlo simulations to enable such V&V. However, NFOT data indicate low exposure rates to Events of Interest (EOIs), suggesting that a large amount of collected data are of minimal to no interest thus could be discarded or logged with a very high compression

KEYWORDS: IOT, Blackbox , Vehicle alert system

I. INTRODUCTION

An integral part of accident investigation process is the assessment of vehicle's Event Data Recorder (EDR), colloquially referred to as vehicle's black box. The black box is an extremely durable electronic device capable of recording valuable information in the moments (typically 5 seconds) before a collision generally the black box system is used in aero plane to get the accident information for investigation purpose. In the proposed system the same black box technology implemented on the road vehicles. The important information like vehicle temperature, vibration occurs, driver alcohol consumption saved locally, and get all the information through the IOT. The potential for incorrect perceptions, decisions, and actions. The industry has used the Naturalistic Field Operation Test (NFOT) project to collect a large amount of driving data and has conducted Monte Carlo simulations to enable such verification and validation. However, NFOT data indicate low exposure rates to Events of Interest (EOIs), suggesting that a large amount of collected data are of minimal to no interest thus could be discarded or logged with a very high compression loss factor. This proposes a data value information metric based on events and data rarity to make locally optimal compression decisions for each short-term buffer. Compressed data and their value are saved in a long-term priority queue to enable removal of the lowestvalue data when finite storage limits are reached. To evaluate SBB performance, we generated a large-scale highway traffic dataset using a simulator that is capable of representing heterogeneous and interactive multivehicle traffic scenarios. [15] and detected EOIs along each simulated driving trajectory. This paper studies four EOIs: lead car cut-in (cut in), host car hard-braking (hard braking), cut-in conflict (conf list) and crash.

II. RELATED WORK

2.2 In 2019 T Kalyani, S Monika, B Naresh, Mahendran Kucha worked on "ACCIDENT DETECTION AND ALERT SYSTEM" As the usage of vehicles is increasing drastically, the hazards due to vehicles is also increased. The

main cause for accidents is high speed, drunk and drive, diverting minds, over stress and due to electronic gadgets. This paper deals with accident detection system that occurs due to carelessness of the person who is driving the vehicle. This introduces accident alerting system which alerts the person who is driving the vehicle. If the person is not in a position to control the vehicle then the accident occurs. Once the accident occurs to the vehicle this system will send information to registered mobile number. 17 2.3 In 2019, Goshala. B1, Madhu Mithai. G2, Jayashree. S3, S. Mutharasu4 Worked On “VEHICLE ACCIDENT DETECTION SYSTEM BY USING GSM AND GPS” Arduino Based Vehicle Accident Alert System using GPS, GSM and Accelerometer. Accelerometer detects the sudden change in the axes of vehicle and GSM module send the alert message on your Mobile Phone with the location of the accident. The advancing technology has made our day to day lives easier. Since every coin has two sides similarly technology has its benefits as well as its disadvantages. The rise in technology has increased the rate of road accidents which causes huge loss of life. The poor emergency facilities available in our country just add to this problem. Our project is going to provide a solution to this problem. 2.4 In 2017 , Hossam M. Sheriff, M. Amer Shaded, Samaha A. Seibel worked on “REAL TIME TRAFFIC ACCIDENT DETECTION SYSTEM USING WIRELESS SENSOR NETWORK” Automatic vehicle accident detection is a life-saving application that is vital in today’s high speed motorways. In case of motorway accidents, notification to the proper authorities must be done efficiently and expediently. The main objective of this paper is to create a Real Time Traffic Accident Detection System (RTTADS) using Wireless Sensor Network (WSN) and RadioFrequency Identification (RFID) Technologies. This paper explains the hardware prototype setup for RTTADS, the algorithms used, the advantages and the limitations of the entire system. Also the configuration of the setup and application software is elaborated. Sensors installed in a vehicle detect the accident’s location, the vehicle’s speed just before the accident and the number of passengers in the vehicle. 18 2.5 In 2017, Mallikarjun Gowda C P, Raju Hajar, C S Mala, Harshith K R, Anuj R Nadir, Prathama P worked on” DESIGN AND IMPLEMENTATION OF REAL TIME WIRELESS SYSTEM FOR VEHICLE SAFETY AND VEHICLE TO VEHICLE COMM. The proposed system aims at developing and designing a suitable system or automobile purposes using ZigBee protocols. The main problems faced in the existing system are inaccuracies in the calculation of speed, distance measurement, and slow response time, etc. The proposed system solves many of the problems faced by the existing systems by using a GPS module instead of the conventional speedometer and also uses sensors which are reliable in areas where human intervention is either unintended or where it puts life to risk. The problems of traffic congestion in urban arterials are increasing day by day and it is very difficult to handle it during emergencies. So we are developing a communication unit within the system to interact with other vehicles in order to clear the lanes. This system aims at communicating with the vehicle in its surrounding with the help of its location (i.e., using the latitude and longitude) to indicate their proximity. When these vehicles are very close in proximity the drivers are cautioned with the help of a message. In this way the drivers can communicate with each other and act according to the situation. 19 2.6 In 2015, 1Mr.Dinesh Kumar HSDK, Shreya Gupta2, 3Sumeet Kumar, Sonali Srivastava worked on ”ACCIDENT DETECTION AND REPORTING SYSTEM USING GPS AND GSM MODULE” With the growing population the use of vehicles has become superfluous. And this has led to the accidents increasing at an alarming rate resulting in a large loss of property and human life. This project aims at finding the occurrence of any accident and reporting the location of accident to the previously coded numbers so that immediate help can be provided by ambulance or the relatives concerned. GSM technology is used to intimate the vehicle position in the form of latitude and longitude coordinates through SMS. The location spot is retrieved using Global Positioning System which is a navigational system using a network of satellites orbiting the earth. Sensors such as vibration, alcohol and fire detectors detect signal in case of an accident occurrence and send a signal to the connected microcontroller The controller in turn operates the relay to blow the airbag and automatically lock the brakes. Meanwhile a message reaches to the necessary help. And thus, ambulance service and required aid can reach in the shortest time possible. This system can also aid companies in the rental vehicle business to keep a track of the vehicular activity by sending message at regular intervals to the authorised numbers. the vehicle accident location by means of sending a message using a system which is placed inside the vehicle system. Author has used assembly programming for better accuracy along with GPS and GSM. In this project, whenever a vehicle meets witan accident immediately vibration sensor will detect the signal and send it to the microcontroller. Microcontroller sends the alert message through the GSM to an authorized mobile no. An alternate condition can be allowed by pressing a switch.

III. PROPOSED ALGORITHM

1. In proposed method, the end vehicle are connected to the cloud using ESP8266.
2. This method helps to track the vehicle and also get the alert from the vehicle.

3. Audio alert for the drivers in emergency situation.

A. *Description of the Proposed Algorithm:*

Aim of the proposed algorithm is to help to track the vehicle and also get the alert from the vehicle. It is also used in flights to get accident information for investigation purpose

Step 1:

In this proposed method, ARDUINO MEGA microcontroller is used to interface with the sensors and to the communication devices.

Step 2:

The LCD is used to update the latest information in the LCD. The crash sensor, Temperature sensor and SD card are interfaced with the micro controller.

Step 3:

The ESP8266 IOT module is used to update the information to the cloud. The GPS device is used to get the information of the location of the vehicle.

Step 4:

The GSM is used to send the SMS to the owner and other rescue persons. In accident zone the black box system collect the information and store the information then give the valuable data.

IV. RESULTS

In this paper, we proposed a smart black box based security data gathering framework. We added extra functionalities to the common vehicle black box, for example, tag number and variety acknowledgment of adjoining vehicles and IOT usefulness to get the data demand message and transfer the put away data. We additionally show the reenactment and execution subtleties of the proposed framework.

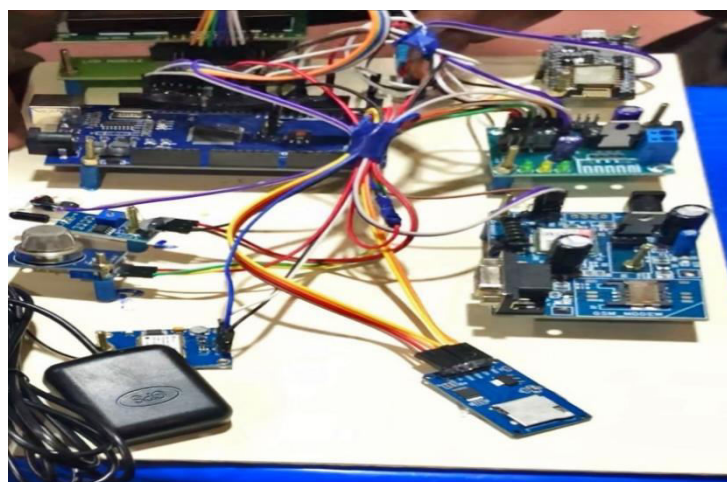


Fig 1:Kit

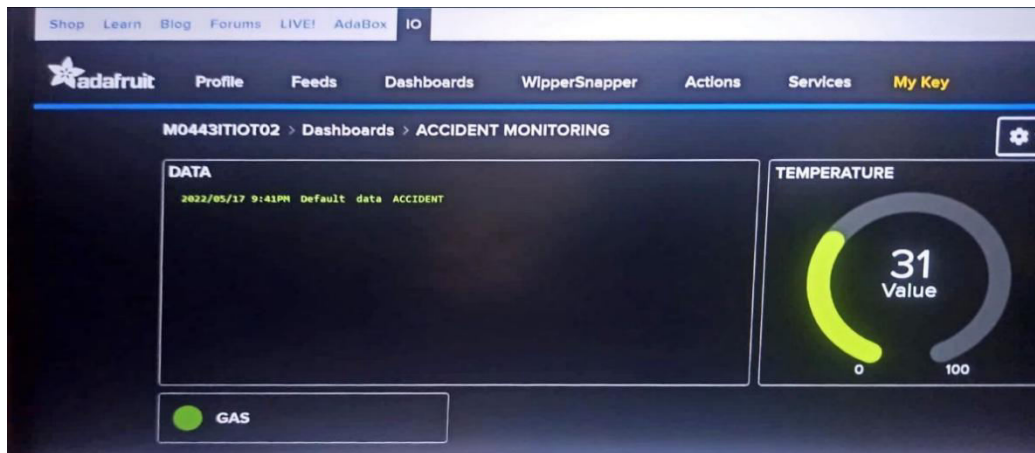


Fig 2: Output of black box

V. CONCLUSION AND FUTURE WORK

In this paper, we proposed an intelligent black box based safety information gathering system. We added additional functionalities to the ordinary car black box such as license plate number and color recognition of neighboring vehicles and IOT functionality to receive the information request message and upload the stored information. We also show the simulation and implementation details of the proposed system.

In future we can use the camera and image processing techniques to get the more information about the accidents, Use of AI automatically found the reason for the accidents.

REFERENCES

1. G. SU, N. LI, Y. YILDIZ, A. GIRARD, AND I. KOLMANOVSKY, "A traffic simulation model with interactive drivers and high-fidelity car dynamics," IFAC-PapersOnLine, vol. 51, no. 34, pp. 384–389, 2019.
2. Z. LI, I. V. KOLMANOVSKY, U. V. KALABIC, E. M. ATKINS, J. LU, AND D. P. FILEV, "Optimal state estimation for systems driven by jump–diffusion process with application to road anomaly detection," IEEE Trans. Control Syst. Technol., vol. 25, no. 5, pp. 1634–1643, Sep. 2017.
3. RAJ KAMAL, "Embedded System Architecture Programming and Design" (2nd edition) ,Tata McGraw Hill, July-2015.
4. C.PRABHA , R.SUNITHA , R.ANITHA ;Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem;International Journal of Advanced Research in Electrical,Electronics and Instrumentation Engineering, 1-4 Dec, 2015.
5. ASHISH KUSHWAHA, GAURAV KATIYAR, &HARSHITA KATIYAR, HEMANT YADAV, SAXENA 'GPS And GSM Based Accident Alarm System' ;National Student Conference On "Advances in Electrical & Information Communication Technology"AEICT-2014 .
6. SRI KRISHNA CHAITANYA VARMA, POORNESH, TARUN VARMA, HARSHA; Automatic Vehicle Accident Detection And Messaging System Using GPS and GSM Modems; International Journal of Scientific & Engineering Research, Volume 4, Issue 8, August-2013.
7. NIRAVTHAKOR, TANMAYVYAS, DIVYANG SHAH; Automatic Vehicle Accident Detection System Based on ARM &GPS ;International Journal for Research in Technological Studies ISSN: - Applied (Online) Vol-1, Issue - 1, Dec 2013.
8. HU JIAN-MING; LI JIE; LI GUANG-HUI, "Automobile Anti-theft System Based on GSM and GPS Module," Intelligent Networks and Intelligent Systems (ICINIS), 2012 Fifth International Conferenceon , vol., no., pp.199,201, 1-3 Nov. 201



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