Design and Implementation of Black Box in Multimodal Transport

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Abstract:- **A vehicle accident is a major public problem in many countries. It occurs due to rider's poor behaviors, Vehicle bad condition, bad weather situations, and opposite vehicle mistakes. To predict those situations, the black box concept is introduced. The concept of the Car Black Box is almost the same as the Flight block box concept, where they mainly focus on which stores the vehicle condition such as engine temperature, speed, and CO_2 content. It also introduces the automatic speed controller to avoid crashing between the vehicles. It is a low-cost system that provides solutions to the existing automotive control systems. And it also monitors the vehicle's current condition on the display LCD. The main aim of this paper is to find out the accident and spot at any location and intimating to hospital or family member through GSM as well as vehicle temperature monitoring. This project is monitoring the vehicle's conditions and other features. It provides the following contribution to detecting traffic accidents via microcontroller and stores the values of GPS, sensor values and time of accident occurred, etc.**

Keywords: Black Box, Speed Controller, GSM, Micro-Controller, Sensor, GPS.

I. INTRODUCTION

In this modern, fast-moving, and insecure world, it becomes an elementary need to be aware of one's safety.

Maximum risks occur in situations where an employee travels for money relations. The Company to which he belongs should be aware if there are some difficulties. Here's a system that functions as tracking and a security system. It's the intelligent vehicle control for critical remote location applications. Pace and security are dealing in this system. The Information is received from GPS antenna present in the GPS module, which is recieved from the satellite in NMEA (Ntional Marine Electronics Association) which revels the position information.The information recieved from the GPS antenna will be sent to the base station to decode.We use the GSM module which has an antenna. The Base station provides the complete data. When a car crash occurs suddenly, the situation of life and death occurs. In this program works on GPS and GSM module incorporating a report of occurrences of accidents via GSM communication platform to the nearest agencies such as hospitals, police stations, fire services, and so on, giving the exact position of the point where the crash has occurred. Many campaigns have been conducted by the people for awareness but the numbers of death and disability are very high because of late assistance to people who got through the accident. In the existing system, most of the vehicles associate only tracking system. Presently tracking system is introduced in vehicles to save people's life.

II. BACKGROUND STUDY (LITERATURE)

PAPER 1:

Title: Implementing Vehicle Black Box System by IoT-based approach
Description:

A vehicle black box is an eventual vehicle tracking system that sits on the dashboard for observing the performance of the vehicle and driver behavior ensuring the safety & security of the vehicle as well as the driver. The main purpose of this project is to create an Internet of Things (IoT) model of the Vehicle Black Box System (VBBS) that can be mounted in any vehicle all over the world. The camera and the sensors will be mounted in the vehicle to monitor activity within the car, wh

PAPER 2:

Title: Black box system for car/driver monitoring to decrease the reasons for road crashes
Description: -
In today's world, people are dieing from accidents every year. Exceedig the speed limit is a contributor to car accident. The principal target of this paper is to track the driver's conduct and physical condition on the road based on the vehicle's speed to reduce the likelihood of an accident. We use a surveillance device that can be put in every car fitted with the OBD-2 standard (On-Board Diagnosis) to monitor the vehicle's current speed in this paper. A Group of sensors and microcontroller are used like PIC microcontroller, shock sensor will be installed in a device.

PAPER 3:

Title: Black Box Modelling of a Bidirectional Battery Charger for Electric Vehicles
Description: -
This paper proposes a black-box modeling strategy for a bidirectional battery charger (BBC) for Electric Vehicles (EV), whether the BBC is operating in the vehicle to grid (V2G) mode or not. Due to the increasing penetration of EVs, the number of battery chargers connected to the grid is also increasing, being a challenge to assess the impact of such a growing number of battery chargers on the grid performance. At the same time, there is no detailed information (static and dynamic) on the commercial chargers used in EVs and connected to the grid. In this approach, a behavioral black-box model is proposed.

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The generation of the model requests performing a number of simple tests on the BBC in order to identify the model parameters. The model was thoroughly tested by simulation, and compared with the results of the generated black-box model and the detailed switching model used as a reference.

III. METHODOLOGY

Arduino Uno is used as the main controller board. An accelerometer is used for detecting vehicle accidents. An accelerometer will check the three axis of the vehicle accident that occurred or not. A gas sensor is used to detect alcohol consumption. If the temperature goes beyond a particular value, then the engine of the vehicle stops immediately.
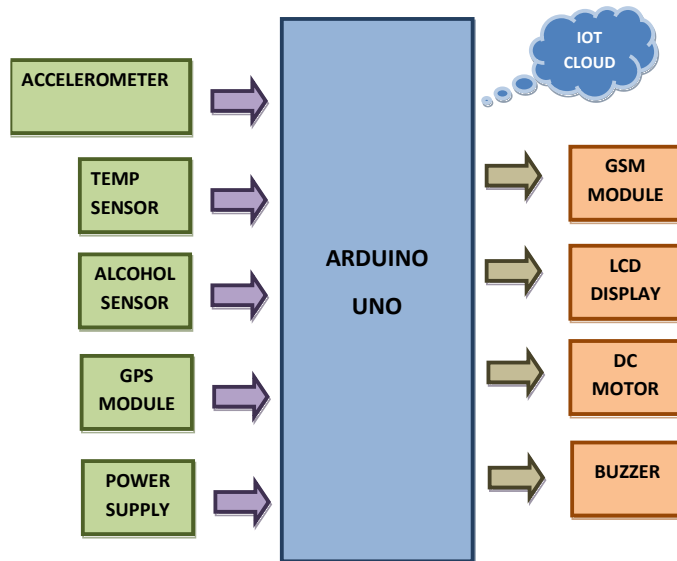

Figure 1: Block Diagram

The GPS module will receive latitude and longitude coordinates from the satellite. Sending alert messages is done by the GSM module. IoT cloud is used as a black box for recording data from the Arduino board through an internet connection. The LCD display was used to display the GPS values and the sensor values. The coding was written in embedded C language and compiled using Arduino IDE.

IV. IMPLEMENTATION

The Implementation of this paper is to design and develop a Black Box vehicle monitoring and tracking by Messaging System Using GPS and GSM Modules. In order to fully understand both GPS and GSM technology, the study of how both technology works are essential to complete the whole paper. The objectives of this paper are:

- To study and investigate the basic operation of the GPS, the GSM module.
- To design and develop the Temperature and Accident.
- To come with my own hardware of vehicle monitoring and GPS/GSM tracking system.
- Using IOT cloud technology to record sensor data as a black box.

V. CONCLUSION

In the above project, we are thinking implement by using an Arduino board. we analyze software and we have installed it. Then we can use sensors in this project and we can start the implementation.

VI. ACKNOWLEDGEMENT

REFERENCES

[1] Priyanka S G, Sanchita, Shreya S Gowda, Sushma B, Dr. Reshma Banu. "Accident Detection and Emergency Rescue Alert System". International Journal of Scientific Research in Computer Science, Engineering and Information Technology 2018, Volume 4, Issue 6.

[2] Kumar, M. Anil, M. Venkata Suman, Yogesh Misra, and M. Geetha Pratyusha. "Intelligent Vehicle Black box using IoT." International Journal of Engineering & Technology (UAE)-SCOPUS March-2018 7, no. 2.7 (2018): 215-218.

[3] S. Shahzad, U. F. Shaikh, A. A. Shaikh, P. K. Mathurkar. "Black Box in Car". Vishwakarma Journal of Engineering Research www.vjer.in Volume 2 Issue 3, September 2018.

[4] A. Das, A. Ray, A. Ghosh, S. Bhattacharyya, D. Mukherjee and T. K. Rana, "Vehicle accident prevent cum location monitoring system," 2017 8th Annual Industrial Automation and Electromechanical Engineering Conference (IEMECON), Bangkok, 2017, pp. 101-105.

[5] Tushar shelke, NilimaRaut, Swati Sayare, Shital Bhade, Shital Manmode5, Rajashri Sadawarti. "Accident Detection System using Black Box System" International Journal of Engineering Science and Computing, Volume 7, Issue No.3, March 2017.

[6] Manish Bhelande, Viraj Chaudhari, Prathamesh Gore, Raj Dhure, Abhishek Bhayye." Car Black Box". International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue No.3, March 2016.

[7] K. Mukherjee, "Anti-theft vehicle tracking and immobilization system," 2014 International Conference on Power, Control and Embedded Systems (ICPCES), Allahabad, 2014, pp. 1-4.]

[8] Dr. Senthil Kumar T., Vishak, J., Sanjeev, S., and Sneha, B., "Cloud Based Framework for Road Accident Analysis", International Journal of Computer Science and Mobile Computing, vol. 3, pp. 1025 - 1032, 2014.

[9] M. R. Priyadharshini and Dr. Padmavathi S., "Survey on Vehicle Detection techniques", International Journal of Engineering Research & Technology (IJERT), vol. 3, no. 3, pp. 420 - 423, 2014.

[10] Z. Liu, A. Zhang and S. Li, "Vehicle anti-theft tracking system based on Internet of things," Proceedings of 2013 IEEE International Conference on Vehicular Electronics and Safety, Dongguan, 2013, pp. 48-52.