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Blackbox System for Vehicles

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Abstract: ***The main purpose of the paper is to develop a prototype of Black Box system that can be installed into any vehicle. This paper describes real-time data collection while driving a vehicle and to check the driving behavior and a car status. This data helps the accident investigators to find out the cause of the accident. The accident is indicated by the use of sensors and the GPS. The car black box is a tool used to record speed, tilting condition, and information about accurate location of the vehicle.***
Keywords*: *Black Box, Microcontroller, Global Positioning System (GPS), Liquid Crystal Display (LCD).

I. INTRODUCTION

In order to avoid these collisions the Black Box system may be the primary step towards the solution. By using the identical concept of black-box utilized in flights we will implement it into vehicles to analyze vehicle crash.

This system could be the solution for investigation and insurance claims and also to enhance the vehicle designs and safety features for future. When an accident or crime happens, data related with those accidents is expected to find the reason for the accident or the wrongdoer of the crime.

The accident is indicated by the use of sensors and also the location and intensity of the accident may be sent via SMS(Short Message Service) via GSM(Global System for Mobile). The car recording equipment could be a tool used to record engine temperature, interruption, speed, vehicle driving, and data about accurate location of the vehicle. The outputs of those parameters are displayed in LCD(Liquid Crystal Display).

The data recorder stores the values of all sensors communicated with the controller. Then this information is transmitted via a wireless network. This collected information are going to be sent to the police server, ambulance via the GSM(Global System for Mobile) network. We are proposing another technique utilizing black box to discover how an accident happened. So as to avoid this collisions the Black Box system are often the first step towards the answer.

II. SYSTEM REQUIREMENT

The main purpose of System Requirement Specification is to translate the ideas in the minds of a client into a formal document. Through System Requirement Specification the client clearly describes what it expects from the proposed system and the developer clearly understands what capabilities are required to build the system. The purpose of this document is to serve as a guide to developers and testers who are responsible for the development of the system.

A. Software Requirements

1) Language: C#.net
2) Operating Source: Windows 7,8,10
3) Backend: MYSQL 5.0

B. Hardware Requirements

1) Regulated power supply
2) Arduino UNO
3) Hall effect sensor
4) GPS receiver
5) ADXL335 accelerometer
6) Switch array
7) Voice module APR9600
8) Speaker

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III. SYSTEM DESIGN

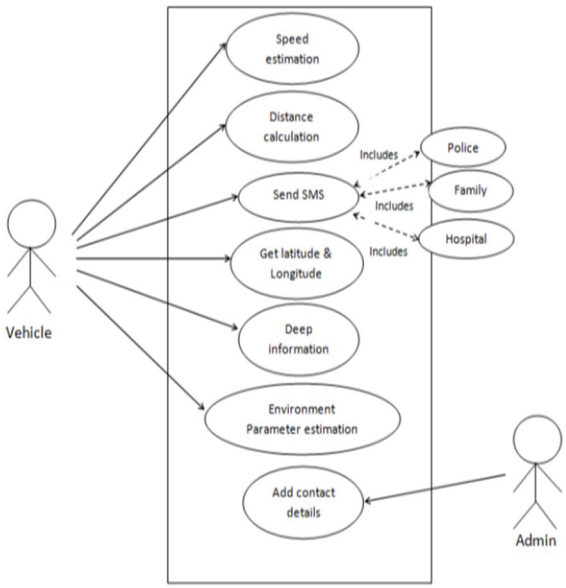


Fig 1: Use case diagram of black box system

The above use case depicts that few information relating to the vehicle can be collected, such as speed estimation of the vehicle. Distance travelled by the vehicle, in case of any accident the SMS can be sent to family, police and the hospital. Depending on the Latitude and longitude they can find the location where the accident has taken place. Different environment parameters are estimated.

IV. CONCLUSION

Now-a-days, there is high demand for automobiles, because of this traffic control becomes hectic and it leads to road accidents. In case of accident, long response time to attend the victim may leads to increase number of death. There are sensors such as hall effect sensor which is used to calculating the speed, Accelerometer is used to find tilting conditions, voice recorder is used to record the voice before the accident and relay is used to start the fan. There is a GPS used to find the location. Kit works only after the GPS gets started. By making use of all this the framework in the proposed system is placed in moving vehicle to detect accident and report to In Case of Emergency .Since the proposed work shows the rpm and speed at the time of accident and also tilting conditions and longitude and latitude can save life .The black box will records the voice of victim after the accident occurs which will be used for further investigation. In future this system can be implemented by adding more modules.

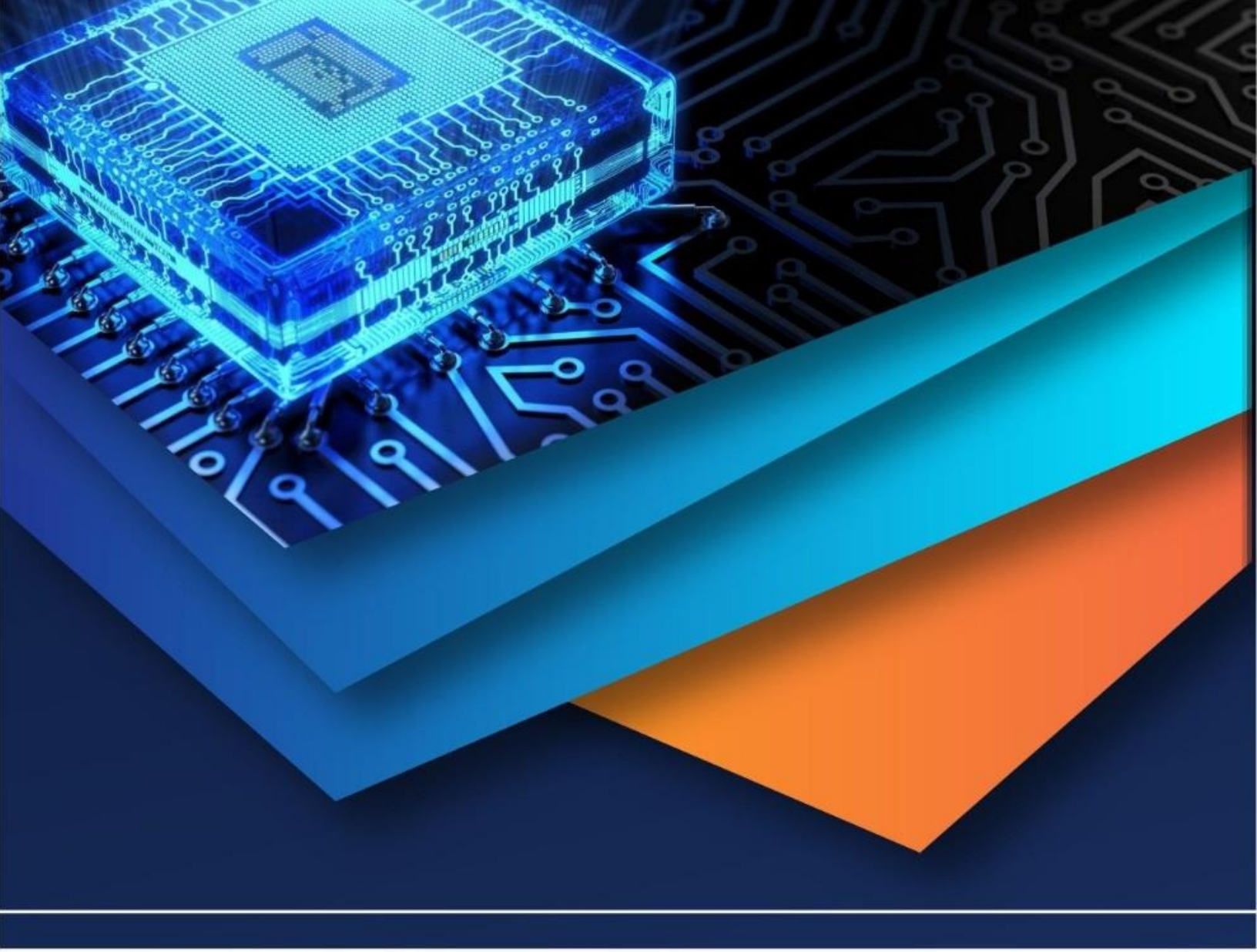
V. FUTUREWORK

We can enhance the current system to check other parameters like fuel level, tire pressure and working of headlights before starting the vehicle. Many other parameters can be read and stored in the memory. Another useful add-on to the current system could be cameras on front and other sides of the vehicles which helps in recording live images and storing them in memory. The stored video data would be much useful for accident investigation.

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