International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 05 | May 2020 www.irjet.net p-ISSN: 2395-0072

CAR BLACK BOX

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Abstract - *This paper demonstrate a designing of a device for vehicle which will not only prevent the accidents but will also look over the safety of the driver. The Car Black Box has functions similar to an airplane black box. Car black box helps to determine what has caused a car accident. It is used to analyze the cause of vehicular accidents and prevent the loss of life and property arising from vehicle accidents.This project proposes a prototype of a Car Black Box System that can be installed into vehicles. The system also involves the improvement of the security by preventing the damage of the Black Box data. Black Box records the relevant details about a vehicle such as Engine's Temperature, Distance from obstacles, Speed of Vehicle, Detects vibration of the vehicle, Detects orientation or inclination of vehicle.*

Key Words: **GPS, GSM, Black Box, Accidents, Accelerometer**

1. INTRODUCTION

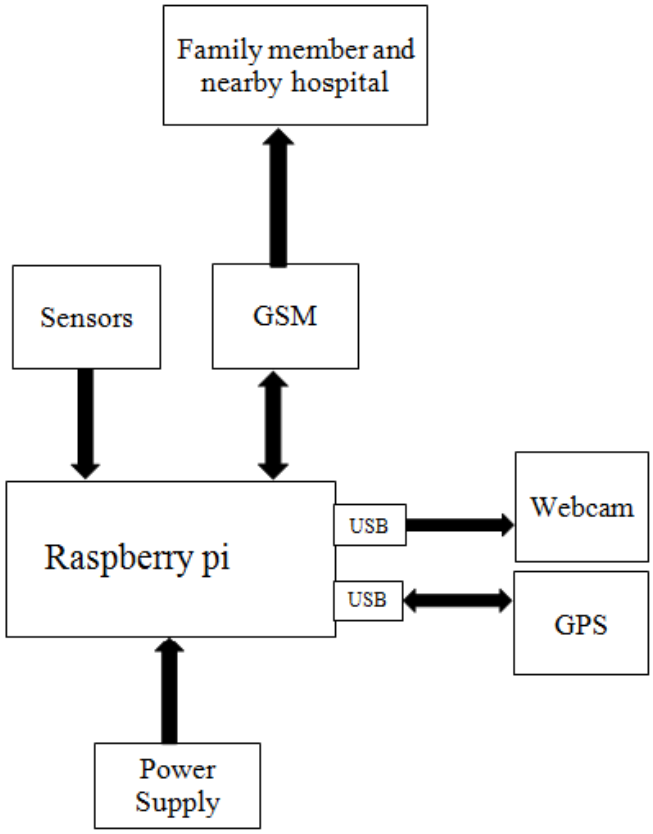
The vehicle accident is a major public problem in many countries. This problem is still increasing due to the rider's poor behaviors such as speed driving, drunk driving, riding without sufficient sleep, etc. Car black boxes are having logical features considering that more people are dying in car accidents than airplane crashes of investigation. The car black box helps to determine what has caused a car accident. They are particularly valuable when no witness is present at the scene of an accident and when each driver has his/her version of the event. A car black box is a digital electronics device, which records and store vehicles speed, vehicle location, vehicle temperature, vibration, distance from obstacles, real-time and vehicle other status information. It helps to discover and to analyze the reason for an accident easily.

In this project we proposed the GPS and GSM for driver assistance and car surveillance. Accelerometer and GPS tracking system is developed to monitor the accident. The system consists of co-operative components GPS device and GSM module. In the event of accident, if any injury happened to the car driver or passengers so maybe there will be loss of lives due to delay in medical help. Keeping this idea in our mind, we are proposing a system where car itself intimates the concern emergency service for immediate reaction in case of accident or any emergency situation. After the accident, this wireless device will send mobile phone short message indicating the position of vehicle by GPS system to family members, nearest police station and hospitals. Below diagram shows the degree of damage due to accident. So, it will be useful of having the proof of incidence.

2. LITERATURE REVIEW

Sr. No.	Research Paper	Summary
1	Kangsuk Chae et al. "Evidence collecting system from car black boxes" IEEE Communications Society subject matter experts for publication in the IEEE CCNC 2010	1] Car owner sends a query to an accident database of the police server. At next stage police database server replies with the accident database which include the where and when the accident happened. 2] Car owner decide whether to send video or not. 3] Made vehicle UI and Police UI
2	Chetan Patil et al,"Low cost black box for car" 2013 Texas Instruments India Educators' Conference Pp 49-52	1] Accident detection. 2] Auto accident notification. 3] Web tracking. 4] Innovation event data recorder. 5] CAN compatibility protocol. 6] Entire black box has been made flexile by incorporating CAN function. 7] Client black box server
3	Hae-Min Moon et al. "A Study on the Context Aware System for Intelligent Automobile Black Box" 2015 27th Chinese Control and Decision Conference Pp 2536-2540	1] LDA-based long distance face recognition technique is used. 2] Protect privacy through face recognition with the moving object approaching car. 3]Where object collides with car identifies danger and generating warning

3. BLOCK DIAGRAM



4. METHODOLOGY

The components in the project consist of Raspberry pi-Model 3B, GSM, GPS, Camera, Sensors such as temperature sensor, pressure sensor, accelerometer. Further description indicates their role and working.

4.1 Raspberry pi

Raspberry pi is the main component in our system. Model B is used to interface various sensors like temperature sensor, pressure sensor and accelerometer in order to collect various parameters. We have also used GSM, GPS and camera to raspberry pi to communicate with it. As shown in above block diagram, as the sensors' readings goes above threshold values, GSM and GPS will give specified output.

4.2GPS (Global Positioning System)

Here, NEO-6M GPS module is used. By interfacing GPS to raspberry pi, we will extract GPS information like Latitude, Longitude and time information from NMEA GPGGA string from GPS module using Python. By using these, locate the current position and we will send it to nearby a hospital and Police station.

4.3GSM (Global system for mobile communication)

System is combined with GPS and GSM to track car incidence. GSM Sim 900A is interfaced with the raspberry pi is used in this project only to send message to desired contact number. By using AT commands and setting appropriate baud rate of micro-controller, message is sent to hospital, police station and relatives which is already predefined in program using python.

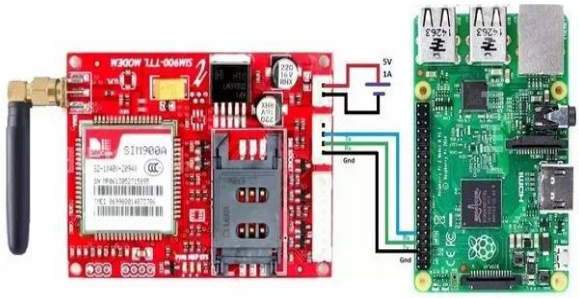


Fig. GSM module interfacing with raspberry pi

4.4 Sensors

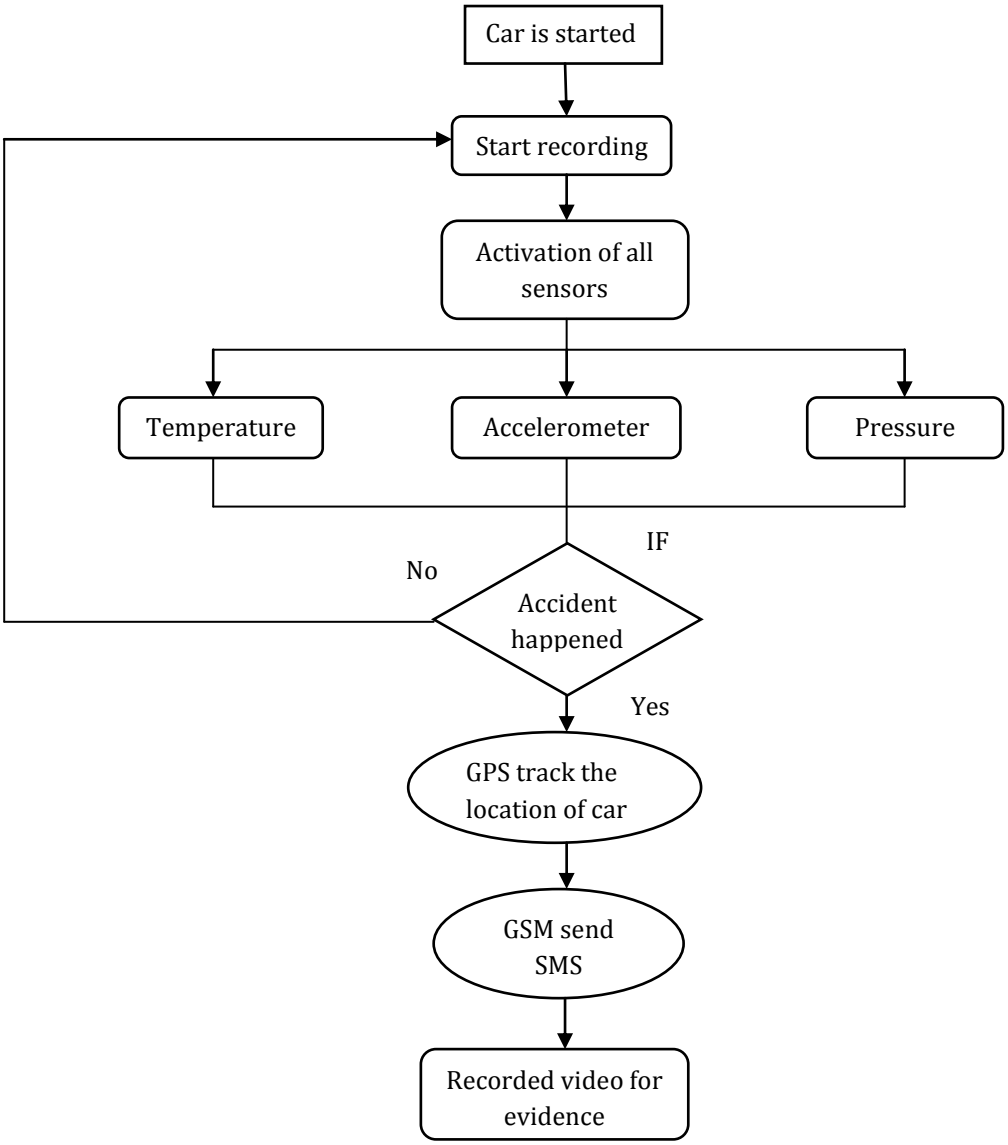
Sr. No.	Sensor	Role
1	Temperature	LM35 is used to sense temperature of the engine.
2	Pressure	If vehicle is collide or crashed, sensor will sense the pressure.
3	Accelerometer	ADXL345 senses the titling of the vehicle given in predefined axes points

4.5Camera

The Quantum QHM495LM 25MP webcam fitted in the vehicle such that it can record the incidence. Further the recorded data will seen by the authorities.. It has life-like picture quality and excellent sound reproduction. It has a built-in microphone. It also has 16 special effects and 10 backgrounds frames. The webcam is fixed in vehicle such that it can cover all the incident area near the vehicle. Camera is used to verify the incident when a report is obtained. In an investigation, when report is triggered then it can be verified through the camera.

5. FLOW CHART

Fig. below shows the process flow of the proposed prototype. When an accident happens, it will activate the processing of sending SMS and location through modules. The SMS will send to a pre-programmed set of numbers through GSM network to inform of the accident. The sent SMS will be containing of the car registration number and GPS location of the car.



6. CONCLUSION

The system proposed here is overall efficient in all the way. Especially, it is best in the investigation for automatic accident detection and notification, navigation, security, web-tracking. The contribution of our demonstration is that we propose a feasible and useful scenario for public safety. Our demonstration shows how to utilize the car black box for car accidents and crime prevention. The greatest advantage is that by providing emergency medical services on time possibility of injury and deaths rates will be reduced.

7. REFERENCES

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