



## **Black Box IOT For Electric Car**

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### **ABSTRACT**

Data services in cars have advanced to a new level thanks to computers and automobiles. The duties of an automobile black box and an aeroplane black box are extremely similar. It is employed to identify the cause of auto accidents as well as to stop property damage and loss that result from them. An automobile black box system prototype that can be put in cars is what this project suggests. By tracking events within the cars objectively, the technology seeks to do crash analysis. The technology also improves security by guarding against data tampering with the recorder. The sensors are controlled by the Arduino controllers. This project's primary goal is to create a vehicle black box system prototype model.

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### **INTRODUCTION**

The term "black box" refers to a flight recorder, which is an electronic recording device installed in aircraft to aid in the investigation of aviation accidents and incidents. Although it is now orange in colour for easier searchability, the concept originated in the aviation industry. As technology and costs decrease, we are working on a project to create a device similar to this for our cars. This gadget will not only aid in post-crash investigation but will also speed up emergency rescue operations. Its goal is to construct an integrated system that will provide emergency rescue services in the case of a traffic collision.

The project's objective is to use a GPS module to locate the accident site and then use a GSM module to send a message to the pre-coded number. Usually, this system is installed inside the car. It cuts down on how long it takes for emergency rescue to get to the scene of the incident. It is an effort to transform the area of motor vehicle accident investigation by recording informative data such as the vehicle's temperature, engine, and distance. With the use of GPS and GSM technology, it may also be utilised for vehicle mapping and accident alerts.

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### **PROBLEM STATEMENT**

Design and develop a black box IoT (Internet of Things) solution for electric vehicle (EV) cars to improve safety, efficiency, and performance. The black box should collect, process, and analyze various data points from the EV car's systems in real-time, providing valuable insights and functionalities for both the driver and fleet manager.

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### **LITERATURE REVIEW**

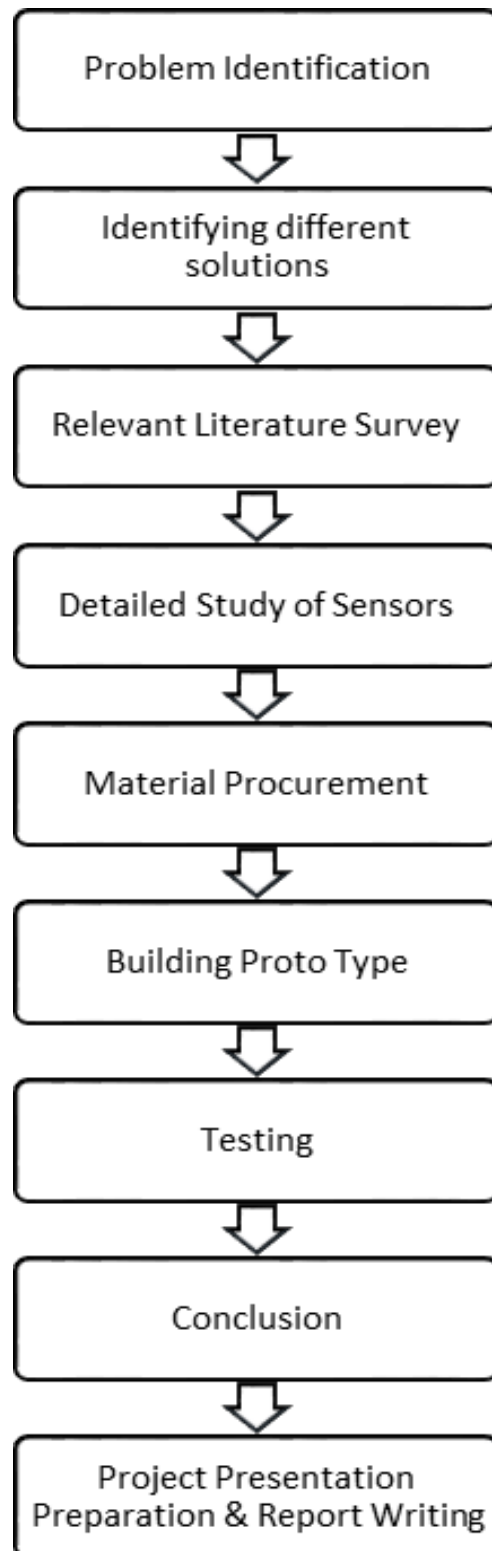
A device used for recording or storing data is known as a data storage device. Almost any type of energy can be used for recording, including electromagnetic energy modulating magnetic tape and optical discs, acoustic vibrations used in phonographic recording, and manual muscle strength used for handwriting. A recording media is a device that simply stores data. Information-processing devices (also known as data storage equipment) can store and retrieve data from either a permanent component or a separate portable (removable) recording media.

**Ranjitha S. L:** When there's an accident, the locals call for an ambulance. The issue here is that the victims are at the mercy of those who live close by. There's a potential that nobody will be in the vicinity of the accident site, or that neighbouring residents will ignore it. This is the manual system's shortcoming. The suggested system is made in a way that, in the event of an accident, the gadget itself notifies the individual in question. The Arduino board, which is used in the proposed system, makes it simple to access analogue pins for input and output as well as to burn and upload programmes. The system locates the accident using GPS, and then utilises GSM to communicate the location as an SMS to the previously coded number.

**Chethana H. T:** Using mobile applications and GPS, our suggested solution offers everyone safe and secure travel. The liquor sensor, temperature sensor, ultrasonic sensor, accelerometer, LED marker, flip switch, DC engine, dump switch, GPS, GSM, and 16x2 LCD are all included in the black box. The

motor temperature, area (GPS), obstruction detection, and fast alcohol substance detection are all identified via the black box. This will result in an LCD display of the results. Through the internet, the information acquired will be sent to both the rescue team and the police server. Our suggested system includes the GPS 9 framework, which makes it easier to track the location of the car in the event of an accident.

#### PROPOSED METHODOLOGY AND OPERATING PRINCIPLE



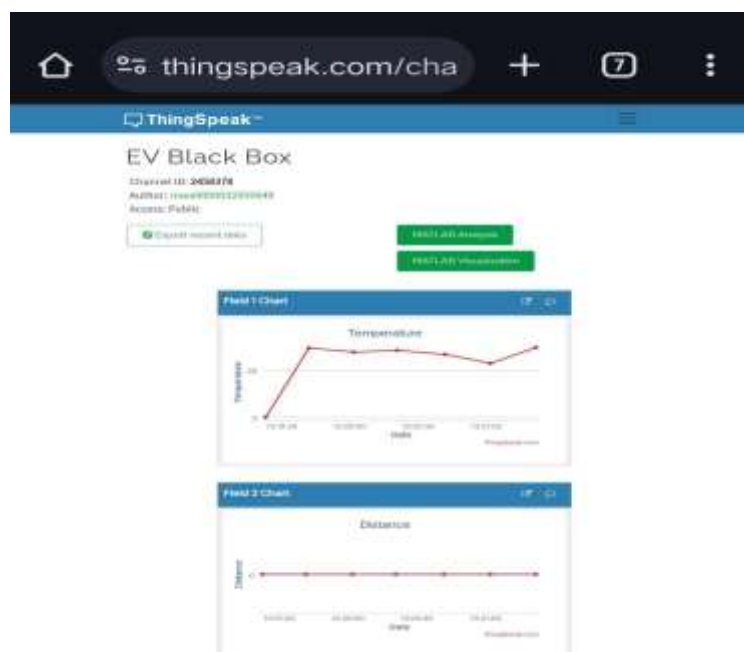
## WORKING PRINCIPLE

The suggested system illustrates how crucial a black box is to identifying an aircraft in the event of an accident. We can determine the cause of the accident by using the location information provided by the black box. A comparable idea is being presented for the ground vehicles. The number of accidents is worryingly rising in the modern day. If this project is carried out, we will be aware of the precise location of the car, the cause of the collision, etc. The data it contains can be utilised to save lives, assist insurance companies in determining the cause, and aid in the creation of more improvised, safer cars and roadways. The information from the black box shows exactly what happened when the car had an accident.

It will capture and save data in an EEPROM, including the vehicle's speed, temperature, fuel level, and break status. Additionally, the collision sensor's presence will aid in informing the designated number about the accident via GSM. The GPS coordinates will show you where the car is. The information kept in the EEPROM will provide a comprehensive picture of the vehicle's location at the scene of the collision. The data can be obtained from the memory via I2C.

## RESULT AND DISCUSSION

### Temperature and Distance –



## CONCLUSION

In conclusion, there is a lot of room for improvement when it comes to road safety using the black boxes in cars. The technology available today can monitor and educate drivers everywhere, at all times. Installing a black box in the car is mostly done to collect different kinds of data in the event that an accident occurs. An effective tool for controlling, regulating, and enhancing the performance of electric vehicles is an IOT black box system. This technology improves the overall efficiency, safety, and reliability of EVs while giving manufacturers and consumers insightful data through real-time data collecting, predictive maintenance, remote diagnostics, and other cutting-edge capabilities.

## FUTURE SCOPE

Accidents in the transportation, insurance, and legal sectors have resulted from the testing and usage of fully and semi-automated vehicles on our roads. Many accidents will happen during the changeover phase, despite the commendable promise of safer roads and fewer incidents. The autonomous world will still see collisions as long as there is a steering wheel and a brake pedal, even if the frequency will be far lower. In order for automobiles to read and store more data than we have seen in the past—such as camera images, driver information, distances to other vehicles, road markings, and road signs—as they grow more autonomous, they will need more integral sensors, luminaries, individuals, and more items, etc.

## REFERENCES

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