Accident Detection Using Raspberry Pi

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ABSTRACT

One of the primary causes of fatalities is traffic accidents. The amount of time between the accident and the arrival of an emergency medical institution at the scene is a key element in the post-accident survival rates. By shortening the distance between the accident and the arrival of a medical institution, death rates are reduced. In order to save more lives. Using Accident Detection Using Raspberry Pi, which alerts if the accident happened and promptly notifies the emergency personnel, is one way to end that wait. The system is detailed, with its primary use being to identify accidents using vibration sensors and send alarm messages to the appropriate locations. The location of the collision, the amount of alcohol consumed, the seat belt use, the speed, and the number of passengers are all included in the alert message. The latitude and longitude data are first stored in this system by GPS, which continually receives input from the satellite[1]. We must transmit the message to a GSM device so that it receives it in order to track the car.. Also, it is triggered by the raspberry pi controller's vibration sensor picking up an accident. When the GSM is turned on, it gets the most recent positional data (latitude and longitude) and sends a message to the program's specified emergency server.

Keyword: *Accident alert, CO sensor, GSM, GPS, LCD, Limit switch, Raspberry pi, Vibration Sensor*

1. INTRODUCTION

The strong demand for vehicles has also led to a rise in traffic congestion and auto accidents. Road accidents are frequently caused by drunk driving both within and outside of cities owing to irresponsible driving on the part of drivers. In addition to drunk driving, unpleasant driving without seat belts also claims life. The public's life is in grave danger as a result. The absence of the best emergency facilities in our nation[2] is the cause of this. This study introduces an autonomous alarm system that provides the most accident-related information. The proposed system can identify accidents in a short amount of time and sends information to the emergency centre in a matter of seconds. This information includes the precise location of the accident as well as details on the speed, blood alcohol content, whether or not the driver was wearing a seat belt, and the number of passengers in the car. This alert message has been sent to the emergency server, which will notify the ambulance, the local police station, the insurance office, and other relevant parties. This will assist to save important lives. In the unlikely event that there are no casualties, a switch is also available close to the diver's seat to stop the message from being sent. This can help save the ambulance and police departments' valuable time. The alarm message is automatically delivered to an emergency server when an accident happens. The message is transmitted via a GSM module, and the GPS module is used to determine the message's position. Vibration sensors provide accurate accident detection. This programme offers the best remedy for the inadequate emergency services offered in the most effective manners in the case of traffic accidents.

1.1 Objective

- We can keep an eye on the car's speed.

- We can discover where the car is.

- Send a text message alerting the user to distant information.

- Anytime can be used to change a mobile number

1.2 Scope and Purpose

The "IoT BASED VEHICLE ACCIDENT DETECTION AND TRACKING SYSTEM USING GPS TECHNOLOGY" is the topic of this project. In our project, we're use a Raspberry Pi. When the system is turned on, the LED will turn on to show that the circuit has electricity. The obstruction is detected by the vibration sensors we are utilising in our device, which subsequently interrupts the Raspberry Pi. The GPS returns the information after receiving the position of the accident-related car.

2. Related Work

Hemangi S. Badhan, Shruti K. Oza et.al [1] One of the primary causes of fatalities is traffic accidents. The amount of time between the accident and the arrival of an emergency medical institution at the scene is a key element in the post-accident survival rates. More lives can be saved by lowering mortality rates by shortening the distance between the accident and the arrival of medical assistance. Using Accident Detection Using Raspberry Pi, which alerts if the accident occurred and promptly notifies the emergency personnel, is one way to end that wait.

Apeksha P Kulkarni et.al [2] An enormous rise in the quantity of physical items or cars on the road is caused by the population boom. As a result of extremely heavy traffic, the number of traffic accidents rises. In this study, the computer vision paradigm is used to monitor traffic flow. Images or a succession of photos improve the road perspective. This research project uses the camera module and Raspberry Pi 3 to identify vehicles, monitor, and estimate traffic flow utilising low-cost electronic gadgets.

Bruno Eraldo et.al [3] The use of the Raspberry Pi 3 with the Open CV library, sensors like the MQ-3 that measures the percentage of alcohol in the blood and the S9 sensor that measures the heart rate, and image processing were used to develop a drowsiness level detection system that integrates image processing. It is known that 33% of traffic accidents worldwide are caused by drunk driving or drowsiness. Also, a touch screen serves as the interface for visualising the data collected by the sensors as well as an alert system. The sensors are used to monitor physiological characteristics like heart rate and alcohol percentage while the image processing approach analyses face emotions.

Md. Yousuf Hossainet.al [4] At the moment, drowsy driving is one of the main causes of traffic accidents. Statistics show that drowsy driving causes a significant number of traffic accidents, many of which end in fatalities and serious injuries. For this reason, numerous studies have been conducted on the development of devices that can assess driver drowsiness and warn him in advance, preventing him from nodding off and causing an accident. Several conventional methods employed measurements based on the vehicle to create their systems, but these measurements are greatly influenced by the design of the road, the type of vehicle, and the driving ability.

Mr. S. S. Kulkarni et.al [5] In this research, a real-time method for detecting driver drowsiness brought on by exhaustion or intoxication is presented. According to a government survey, 33% of accidents are caused by drinking alcohol, while 22% of accidents are caused by being sleepy. It is indeed a difficult task to build a method for an automobile that can identify a driver's tiredness. Image processing techniques may be more helpful to fulfil this task. The embedded system, which runs Raspbian OS, supports the camera.

Rickin Patel, Vipul K. Dabhi et.al [6] One of the most important issues in our rapidly changing world is road traffic. The analysis of several problem-related features and issues is presented in this essay. This study focuses on using the Internet of Things (IoT), a well-known technology, to create smart systems to monitor numerous factors linked to road traffic and use them for practical solutions. The analysis of the current systems and the relevant problem-solving methods are covered.

3. SYSTEM ARCHITECTURE

The strong demand for vehicles has also led to an increase in traffic congestion and auto accidents. Road accidents are frequently caused by drunk driving both inside and outside of cities owing to irresponsible driving on the part of drivers. In addition to drunk driving, unpleasant driving without seat belts also claims life. The public's life is in grave danger as a result. The absence of the best emergency facilities in our nation is the cause of this. This study introduces an autonomous alarm system that provides the most accident-related information.The proposed system can identify accidents in a short amount of time and sends information to the emergency centre in a matter of seconds. This information includes the precise location of the accident as well as details on the speed, blood alcohol content, whether or not the driver was wearing a seat belt, and the number of passengers in the car. This alarm message has been sent to the emergency server, which will notify the ambulance, the local police station, as well as the insurance office, helping to save the lives of those who need it most. In the unlikely event that there are no casualties, a switch is also available close to the diver's seat to stop the message from being sent. This can help save the ambulance and police departments' valuable time.The alarm message is automatically delivered to an emergency server when an accident happens.
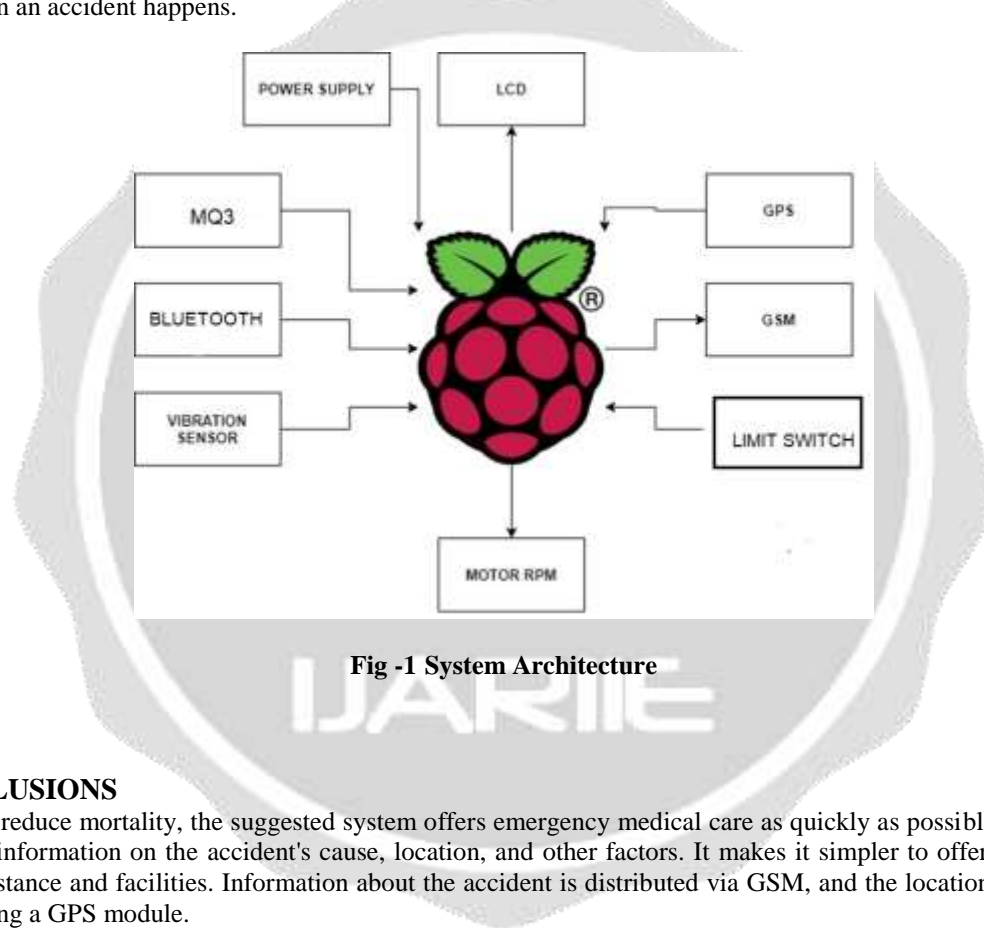

Fig -1 System Architecture

4.CONCLUSIONS

In order to reduce mortality, the suggested system offers emergency medical care as quickly as possible. Its purpose is to offer information on the accident's cause, location, and other factors. It makes it simpler to offer the accident victim assistance and facilities. Information about the accident is distributed via GSM, and the location of the car is tracked using a GPS module.

5. ACKNOWLEDGEMENT

The authors can acknowledge any person/authorities in this section. This is not mandatory.

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