

# Vehicle Accident Detection and Alert App

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**Abstract:** According to a report by the transport research wing of the ministry of road transport and highways, a total of 151,113 people died in 480,652 road accidents across India in 2019, an average of 17 an hour or 414 a day. With this, India is standing firm as the nation with the most road fatalities, followed by China. Information about the accident, like the accident location and time of the accident, is considered a major element required to save lives. We aim to detect victims with their location and request help for them with the help of high technology sensors, which are present in most mobile phones, like GPS and Accelerometer. With the help of the data received from these sensors, the rescue services can save valuable human lives much faster.

## I. INTRODUCTION

In India, most road accidents occur with the following as their main reason. In 2019, "Over speeding" was the reason for 86,241 accidents and it is the main cause for most of the accidents. It is followed by, "Careless Driving" which was the cause for 42,557 accidents, "Inclement Weather" which caused 4,953, "Drunken Driving" which caused 2,972 accidents, and 2,045 accidents were caused by "Mechanical fault". While including the fatal and non-fatal accidents, Tamil Nadu tops in road accidents for three successive years in India. Tamil Nadu is recorded to have the highest number of accidents on State Highways with a count of 19,279. The number of road accidents in Tamil Nadu is reduced in 2020 due to the COVID lockdown. Still, the fatality count between 2019 and 2020, is reduced only by two thousand. Most of the precious lives lost in road accidents due to the inability to identify the correct location of the accident and the inability to request help from the rescue services at the time of the accident.

With India's huge population, the number of accidents increases every day, and the need for road safety also increases. Even though there are many safety-based mobile applications in the google app store, most of them were withdrawn. There were cases where the victims' lives would have been saved if help arrived early and, in some cases, the location of the victims can't be found at the earliest time possible. If the victims were able to ask for help at the time of the accident with their location and help arrived at that location as early as possible, then their safety can be secured. This paper is

based on the idea to create an application with the same features.

## II. SCOPE OF THE PROJECT

Avoiding casualties caused by road accidents is the main goal of this paper, with the help of Accelerometer and GPS present in the mobile phones. Based on the data collected from these sensors, which are present in most mobile phones, the location of the accident is sent at the same time of the accident to the friends and relatives which the user allowed and stored, and also to the rescue and emergency services.

## III. EXISING SYSTEM

This idea proposal has been done introduced at the start of the modern age of mobile phones. With the introduction of GPS sensors in the mobile, security applications based on GPS, were proposed. Then they proposed special hardware devices which can be linked with mobile phones. Though, it had the disadvantage of actually buying extra hardware with more money. With the massive development of mobile phones in the last decade and new sensors added with the development, the extra hardware can be avoided. The present application of this paper is present in a very few countries and providing the information with the relatives and friends with the emergency services the efficiency of the application can be increased massively.

## IV. PROPOSED SYSTEM

The main idea of this paper is to build an application that makes use of the sensors present in mobile phones like GPS and Accelerometer and detect any collision if there is a sudden external disturbance in the speed with the help of the Sensor Fusion Based Algorithm. With the help of the data obtained from the Accelerometer sensor, when there is a sudden disturbance to the mobile phone, the user is notified with an alert message before sending the request help signal. If no emergency is required, they can cancel it within 10 seconds. But, if they press the "Call Help" button or if the alert message is unattended for more than 10 seconds, the "request for help" message will be sent to the emergency services as well as the family members, the users provided.

### V. SYSTEM ARCHITECTURE

In this system, the external disturbance is detected by the accident detection module and when it is detected, a function is called to find the current location

of the user with the help of GPS in the Location Detection Module. The location data obtained from the GPS is sent to the emergency services to request help.

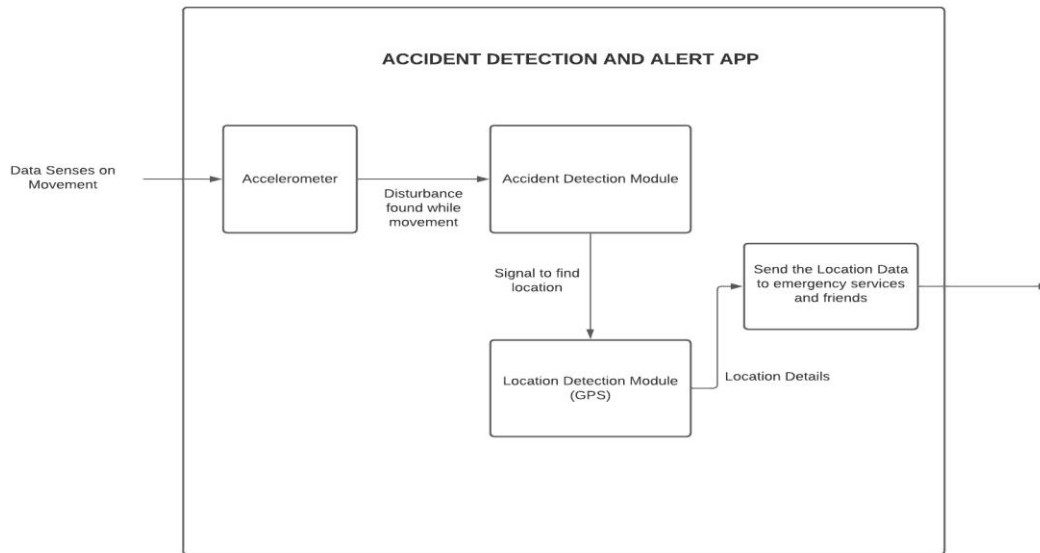


Figure 1: System Architecture

#### A. UML DIAGRAMS

##### Use Case Diagram

The data is obtained from the sensors while getting external disturbance are used to the request for help.

USE CASE DIAGRAM:

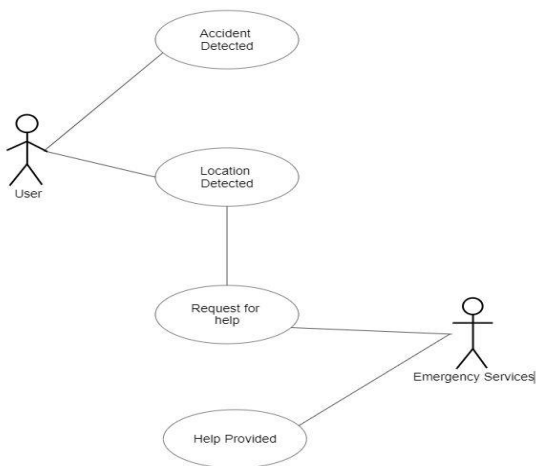


Figure 2: Use Case Diagram

##### Data Flow Diagram

This Diagram shows the data flow within the application which includes user to application, application to user and application to emergency services

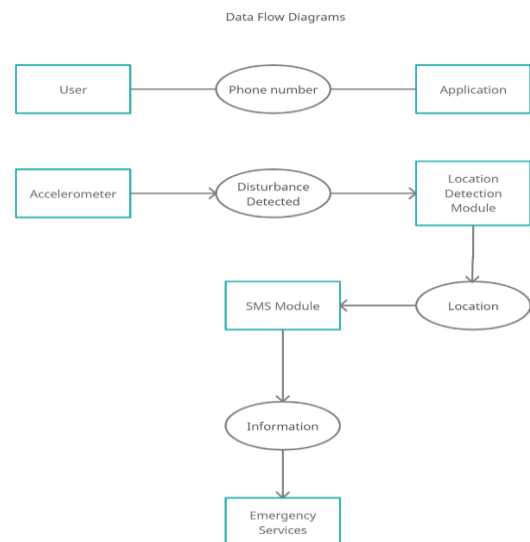


Figure 3: Data Flow Diagram

**Flow Chart**

This flow chart provides the overall flow of the application from the detection of the accident to the help provided by the emergency services.

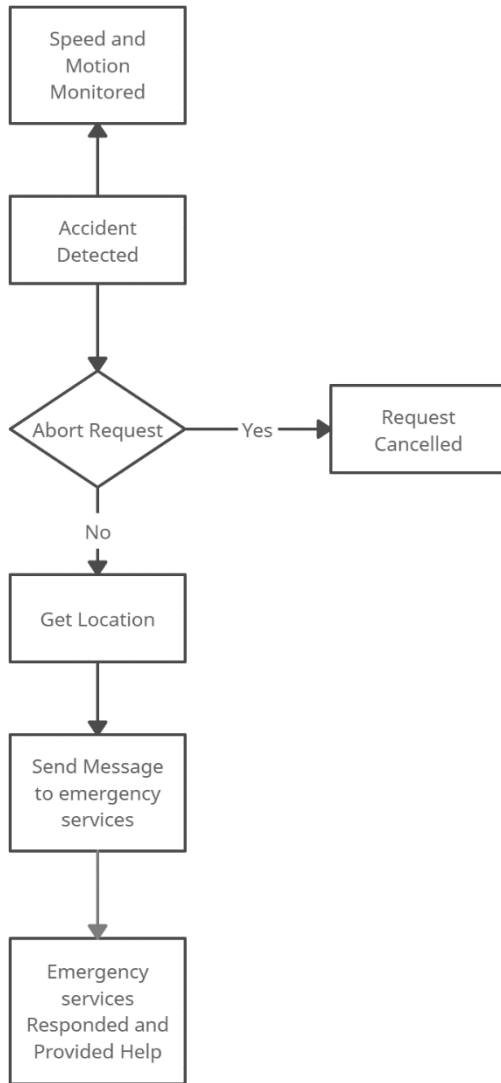


Figure 4: Flow Chart

**VI. MODULES**

There are 3 major modules that are present in this application. They are

- Accident Detection Module
- Location Detection Module
- Message Transfer Module

**Accident Detection Module:**

The movement of the mobile phone is monitored by the accelerometer sensor. When there is a sudden disturbance, its value goes more than 2. When its value is more than 2, The module provides a pop-up, it provides

an option to cancel the request for help. If the pop is left undisturbed for more than 10 seconds or the “Need Help” button is pressed, a request is sent to find the location of the mobile phone.

**Location Detection Module**

When the request to find the location of mobile phone is received, with the help of the Global Positioning System, the position of the mobile with latitude and longitude is found. This data is sent to the message transfer module.

**Message Transfer Module**

The data obtained from the Location Detection Module is used to request help from relatives, friends, and emergency service. With the location of the accident sent at the time of the accident, help can arrive as fast as possible and lives can be saved.

**VII. CONCLUSION**

With the help of this application, by requesting help at the time of the accident and sending the location of the accident to the emergency services, friends, and relatives. Before sending the information and finding the location, the user of the app is asked for permissions to provide the GPS data and also send messages directly from the app. If the permissions are not provided, the application asks for the permission again. With the help of this application, the rescue services can help human lives faster and more lives are saved.

**RESULTS**

The overall result of this project is an application that provides helps to people who require help but can’t ask for it. With the help of the application, their request for help is sent at the time of the accident with their location which helps emergency services provide support as early and effective as possible. All this is done with only the sensors available in most mobile phones and no additional equipment.

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