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A Driver Safety System using Android (Mind your Route)

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Abstract: ***The initiative of the project is to develop an Android application which increases road safety. We aim to utilize the android studio for developing a mobile application. As there is a drastic Increase in number of vehicles so are the accidents caused in day-to-day life. So, Road Safety is the major concern. Logistics plays a vital role as it is the supply chain for delivering or transportation of goods. The heavy vehicles which are involved in this process are observed in accidents which cause huge damage to people's lives. To Improvise the safety, we are here to implement an Android Application which provides or pushes notifications/alarms.***

I. INTRODUCTION

In today's world, driving has become an important part of our daily life. However, as the number of vehicles increases, it becomes even more difficult to ensure driver safety. According to the World Health Organization (WHO), traffic accidents cause more than 1.35 million deaths and an additional 50 million injuries or disabilities each year. One of the most common causes of traffic accidents is speeding, which is responsible for about 30 percent of all road deaths. To solve this problem, we developed an Android application that ensures driver safety by notifying the driver of speeding. The main objective of the project is to promote road safety by reminding drivers to obey distance limits, which will reduce the number of traffic accidents caused by distance between vehicles. The application uses GPS technology to calculate the distance between vehicles and compare it with the specified limit. If the driver exceeds the distance limits, the application notifies the driver with a visual or audio notification. The software also provides real-time information about the current location of the driver and the distance between the nearest user on the road. The application is user-friendly and easy to install. It can be installed on any Android device running version 4.4 or higher. After installation, the application automatically runs in the background and monitors the location of the driver. To make the app more efficient, we've added several features specifically designed to improve driver safety.

II. PROBLEM STATEMENT

Road accidents are the leading cause of injury and death worldwide. Most accidents are due to human error, especially speeding and following distance. Although traffic laws are in place to regulate distance, drivers often exceed the limits, putting themselves and other road users at risk. Therefore, a system is needed to help drivers maintain a safe distance.

One solution to this problem is to provide real-time notifications to drivers when they exceed the distance limit. This system uses algorithms to detect the driver's distance between the driver's vehicle and the vehicle in front of him. When distance limits are exceeded, the system warns the driver with an audio signal.

The goal of this project is to develop and implement a system that can provide real-time alerts to drivers about exceeding distance limits, thus improving driver safety and reducing the number of traffic accidents caused by human error. This system must be cost-effective, easy to install and easy to use so that it can be widely adopted by drivers of all skill levels.

III. LITERATURE SURVEY

We have carried out the survey on the below topics

1) Road Accidents and Survey

India has a high rate of road accidents, with heavy vehicles being involved in a significant number of them. According to data from the Ministry of Road Transport and Highways, in 2020, heavy vehicles were involved in 16.8% of all road accidents in India, resulting in 19,456 deaths.

The main causes of road accidents involving heavy vehicles in India include overloading, poor vehicle maintenance, driver fatigue, reckless driving, and poor road conditions. Overloading of cargo is a common practice among truck and lorry drivers in India, which puts additional strain on the vehicle and makes it difficult to maneuver, leading to accidents.

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In addition to this, drivers often work long hours without adequate breaks, leading to fatigue and reduced concentration levels. Poor road infrastructure and inadequate safety measures such as speed limits, road signs, and lighting also contribute to accidents involving heavy vehicles in India, there is still a long way to go to ensure the safety of heavy vehicles on Indian roads.

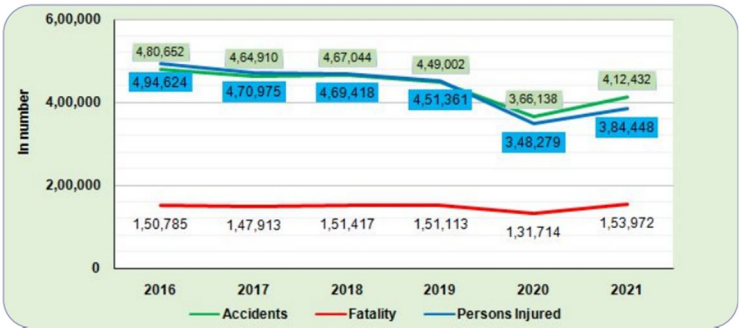


Fig 1 Number of Accidents 2016-2021

2) Types Of Driver Safety System

Alcohol ignition interlock devices prevent drivers from starting their vehicles if their breath alcohol content is above a set limit. The Driver Alcohol detecting System for Safety (DADSS) programme, which would install alcohol detecting devices in all cars, has been demanded by the Automotive Coalition for Traffic Safety and the National Highway Traffic Safety Administration.

A blind spot monitor uses cameras to keep an eye on the driver's blind areas and alert them if any objects are approaching the car. Blind spots are places that the driver cannot see from the driver's seat and are either behind or to the side of the vehicle. When obstacles enter the vehicle's path, blind-spot monitoring systems typically work in tandem with emergency braking systems to respond appropriately.

The goal of driver fatigue detection is to stop collisions from occurring. To establish whether the driver's actions are consistent with his or her facial patterns, steering movements, driving behavior's, use of turn signals, and driving speed sluggish driving. The car will normally emit a loud alert and possibly vibrate the driver's seat if it suspects drowsy driving.

A driver monitoring system is intended to track the driver's level of awareness. These systems evaluate a driver's awareness and capacity for safe driving practises using biological and performance indicators. Currently, these systems track the driver's eyes to gauge their level of concentration using infrared sensors and cameras.

Electric car warning noises, which are often given through a noise, such as a beep or horn, alert pedestrians and cyclists to a hybrid or plug-in electric vehicle's proximity. This technology was created in response to the US National Highway Traffic Safety Administration's mandate that by September 2019, 50% of quiet vehicles must be equipped with a device that activates when the vehicle is moving at less than 30 km/h (18.6 mph).

The forward collision warning (FCW) system keeps track of the speed of the car, the car in front of it, and the space around the car. If a vehicle gets too close to the one in front of it, FCW systems will warn the driver of a potential impending collision.

IV. METHODOLOGY

This is basically an android application that is being created to notify the driver /the vehicle user when he/she crosses the limits of distance. To achieve this, we have used the following:

This Application majorly involves

A. Google Maps

Google Guides is a web-based planning administration sent off by Google in 2005. It lets users see maps, explore the world, and get directions to a variety of places. At the outset, Google Guides covered a couple of urban communities in the US, however it immediately extended to the entire world.

Google Guides utilizes satellite pictures, road maps and other geographic information to give a total and precise image of the world. By panning, zooming in and out, and clicking on various locations for more information, users can easily navigate the maps. One of the critical highlights of Google Guides is its capacity to give ongoing traffic updates to assist clients with keeping away from gridlocks and track down the quickest courses to their objections. Google Guides permits clients to design courses for strolling, cycling and public vehicles, making it a flexible method for getting around.

Street View, which provides a 360-degree view of several streets and locations, is another popular feature of Google Maps. Users can virtually explore various locations and get a better idea of how they look with this feature.
In general, people use Google Maps to find their way around their neighborhood or the world and to conduct research. Google Maps continues to be one of the most widely used mapping services due to its extensive coverage, precise maps, and user-friendly interface.

B. User's Location Access

Our main goal is to improve the driver safety and prevent the accidents in the real-world scenario so here we get into mind your route option and it asks to choose the google account as itself describes a user to the admin(developers) then the app takes user's location through the google maps API by using the location tracking method.

C. Nearby Detection Algorithm

This is the required and desired functionality or technique in our programme that performs the entire process to prevent accidents and notifies the user. The proximity detection method is a statistical technique that employs the Brute Force graph search method to determine whether one user has moved closer to another. The programme calculates the distance between two users using locations obtained in the form of latitudes and longitudes and statistical interpolation methods. The user is then notified if the calculated distance is less than 10 metres.

V. SYSTEM ARCHITECTURE

System architecture is the process of designing, planning, and organizing the structure of a complex system. It involves identifying the various components of the system, determining how they will interact with each other, and defining the rules and protocols that govern their communication and operation. In the context of computer systems, system architecture refers to the overall design and organization of the hardware and software components that make up a computer system. This includes the central processing unit (CPU), memory, storage devices, input/output (I/O) devices, and network interfaces.
The below figure describes the way the components interact with each other.
The user interacts with the UI of the application and sets the destination, then the navigation in google maps opens and now the location ping will be continuously sent to the backend and the notification will be sent to the user if at all he crosses the limits of distance.

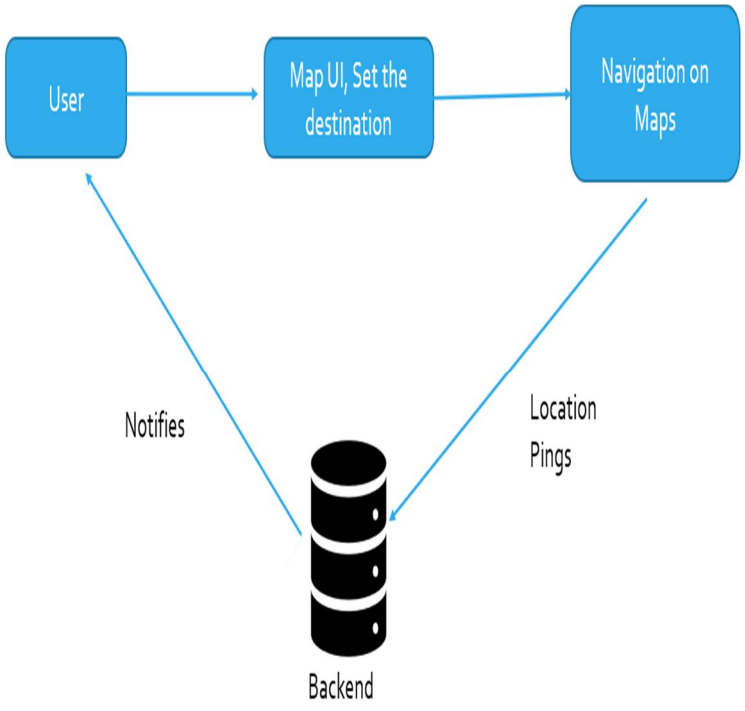


Fig 2. system architecture

The diagram below is a flow chart. This explains the flow of the major functionality in the application.

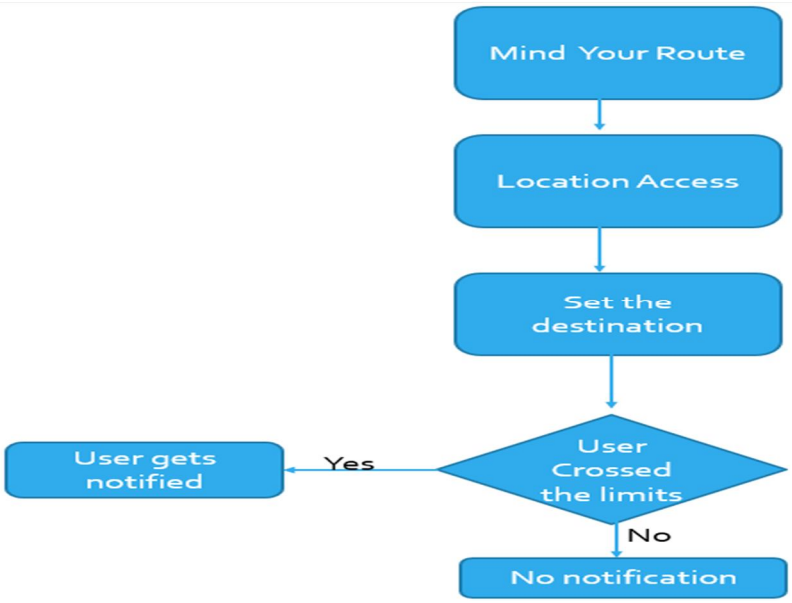


Fig 3. Notification system

Notification system

The notification system implemented in the project is a critical component that enables the application to function effectively. By tracking the location of each vehicle and calculating the distance between them, the system can provide timely and accurate notifications to drivers when they get too close to other vehicles. To implement the notification system, we need to set up a data collection system that tracks the location of each vehicle. This can be done using GPS technology or other location tracking tools. Once we have this data, we can use algorithms to calculate the distance between vehicles and their relative speeds.

We have to define the notification triggers, need to implement the notification system itself. This can be done using Android's built-in notification framework, which allows us to create and send notifications to the user's device.

VI. CONCLUSION AND FUTURE ENHANCEMENT

The Application operates on smartphones and tablets, which are easily accessible to most drivers. It uses GPS technology to track the vehicle's location. Whenever the vehicle crosses the distance limit, the application sends an instant notification to the driver, alerting them to the violation. The notification includes the current location of the vehicle, making it easier for the driver to take corrective action.

One of the primary benefits of this Android application is that it promotes safe driving habits. By notifying drivers when they exceed distance limits, the application encourages them to drive more responsibly. Over time, this can lead to a reduction in the number of road accidents and fatalities. Additionally, the application can help drivers avoid fines and penalties for violating traffic laws, which can be costly and time-consuming.

The Android application is highly cost-effective as it does not require any special equipment or hardware. Unlike other vehicle safety technologies, such as collision avoidance systems or lane departure warning systems, it runs on a standard smartphone or tablet, making it accessible to a wide range of drivers. This also means that the application can be easily updated and maintained, ensuring that it remains effective over time.

Furthermore, the Android application is highly efficient. It does not require a constant internet connection, making it ideal for use in areas with poor network coverage. The application runs in the background, consuming minimal system resources and battery life, ensuring a seamless user experience that does not interfere with other applications or activities on the driver's device.

In conclusion, the Android application developed for this project is an innovative and practical solution for improving the safety of vehicle users. By providing real-time notifications when distance limits are crossed, the application can prevent accidents and promote safe driving habits. This cost-effective and efficient tool is a valuable addition to the current suite of vehicle safety technologies available on the market.

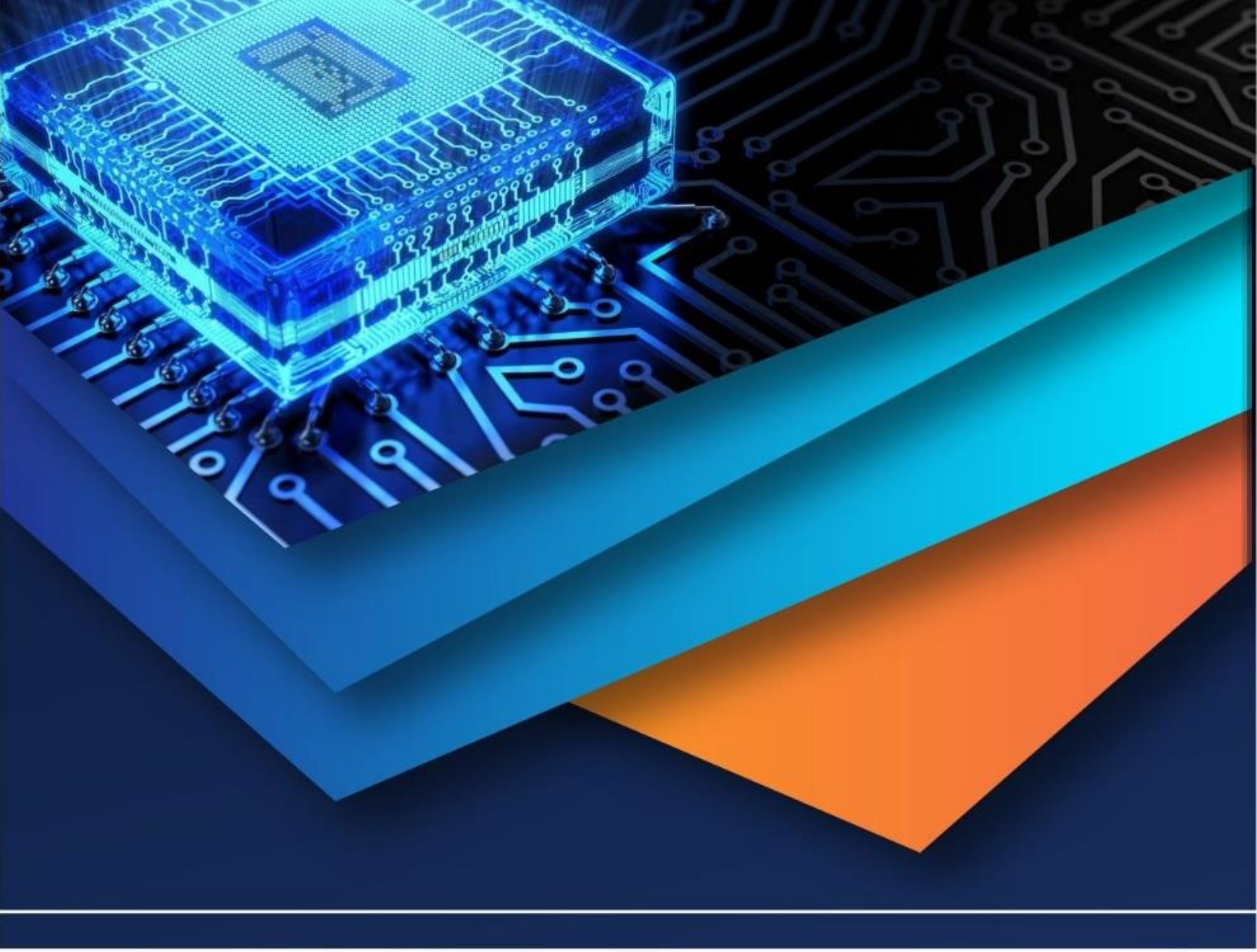
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Future work on this project could include expanding the application's functionality to include additional features, such as real-time traffic updates or weather alerts. Additionally, the application could be integrated with other vehicle safety technologies, such as automatic emergency braking systems or adaptive cruise control. Finally, the application could be promoted to a wider audience through social media campaigns or partnerships with government agencies and insurance companies. By continuing to develop and improve this Android application, we can help make our roads safer and reduce the number of accidents caused by speeding and other violations of traffic laws.

REFERENCES

[1] Ministry of Road Transport and Highways.
[2] The 9th International Conference on Future Networks and Communications (FNC) Vehicle as a Mobile Sensor Sherin Abdelhamida,∗ , Hossam S. Hassaneina , Glen Takaharab
[3] "Smartphone-based Driver Safety Monitoring: Applications, Challenges, and Opportunities" by Minming Li and Jun Chen, published in IEEE Transactions on Intelligent Transportation Systems in 2019.
[4] "Real-time Monitoring of Driver Behavior for Accident Prevention" by M. Sivakumar and S. Suresh Kumar, published in the International Journal of Advanced Research in Computer Science and Software Engineering in 2017.
[5] "Driver Behavior Analysis and Accident Prevention using Machine Learning Techniques" by R. Elakkiya and K. Saravanan, published in the International Journal of Computer Science and Mobile Computing in 2018.
[6] "Accident Detection and Reporting System using GPS, GPRS and GSM Technology" by N. V. Madhu Kumar and B. Ramesh Babu, published in the International Journal of Innovative Research in Science, Engineering and Technology in 2016. This paper describes a system for detecting accidents using GPS, GPRS, and GSM technology.

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