ACCIDENT CONTROL FOR SHARP EDGE CORNER DECTECTION USING ANDROID APP.

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Abstract:

With the recent advancements in mobile technologies, most of the mobile phones releasing now or already in use are smart phones. Every smart phone has an inbuilt GPS. This project presents an alert application to alert incoming sharp corners and accident prone zones with GPS assistance for road users. In India on, the totalnumber of road accidents are 5, 01,423 number of persons killed are 1, 46,133, number of persons killed per 100 accidents is 29.1. About 57 accidents take place and 17 lives are lost every hour on an average. In India 37% of accidents happen due to high speed. GPS is one of the elements which is readily available with smart phones, which can be used in reducing the accidents. This project provides a GPS based application which provides “Alert” sound to notify the drivers that there are sharp corners or accident prone zones ahead. A triangulation algorithm will be developed to track the sharp corners in the google map. The vehicle speed is measured using GPS parameters. A warning alert is produced based on the distance to sharp corner and speed of the vehicle. Hence, drivers will be likely ready to take the corners readily and safely by managing their vehicle speed when hearing precaution sound. Accident prone zones, school zones and rush junction can also be included in the alert system to warn the driver.

INTRODUCTION

Safety technologies in terms of advanced driver assistance systems(ADAS)arestartingtocontributetocasualtyreduction and hold potentially large future promise. In recent years, researchwasveryactiveinordertoincreasetrafficsafety.

A special type of accidents are single vehicle crashes in which no other road user is involved. These accidents include run-off-road collisions, rollover crashes and collisions witha solid obstacle like a tree when traversing the roadway unintentionally. An improvement of road infrastructure and the installation of safety facilities like guardrails contribute to decrease the fatalities by passive safety. Even if the statistical data kept by the European union identifies a decrease of 36% of single vehicle accidents in the last ten years, single vehicle crashes are still responsible for one third of all traffic accident fatalities in countries of the EU [1]. Thereby, country roads andnon-urbanareasaccountforthemostaffectedroads.

Many researchers have focused on event detection and extraction based mainly on the data generated in the cyberspace, which means social media platforms such as Twitter, Instagram, and Foursquare [2], [3], [4], [5]. These data might be able to detect geo-spatial events, but might be hard to do before the events occur, because the users tend to share the location information of the events after arriving at the venue. On the other hand, the traffic flow towards the venue might indicate the event occurrence before the attendees gather around the venue.In addition, researchers have studied many different applications of ubiquitous computing in a city space, such as intelligent transportation systems, participatory sensing, and city monitoring [6], [7], [8].

In this paper, we present an early event detection technique named Bus Beat where we use Time-dependent Congestion Network (TCN) and GPS trajectories collected fromperiodic-cars, such as a transit bus, shuttle, garbage truck, or municipal patrol car, which periodically travel on apre-scheduled route with a pre-determined departure time. Since the periodic-cars are disallowed to use an alternative route even when an anomaly traffic jam occurs, their trips are adversely affected by the traffic jams and congestion

2.Related Work

This might lead to a crash and could cause severe damages in terms of property and life and the user requires time to make a decision.The pressure applied to the brakes depends on the speed. Hence it's difficult to avoid accidents at higher speeds. (1). Accidents result in damage to property and personnel with change of energy from kinetic to ill energy. Kinetic Energy = (1/2) mv2 (1) Where m = mass of object and v = speed of the vehicle. When brake is applied, two forces work on the vehicle to decelerate the speed Considering the friction coefficient 0.8 for a plain road surface and standard gravitational force (9.8 meters per square second), from the Equation 2, we can get the final speed of a vehicle (u) after one second once the brake is applied. This is the maximum speed after considering the deceleration factors. Above table shows the necessary data related to the collision. As such, if the speed is less than these maximum speed, than it would be assumed that some other deceleration force worked on the vehicle to reduce the speed and an accident has occurred. t= (v-u)/a (2) where v = initial speed, u = final speed, a= acceleration or deceleration.

Speed Measurement

Usage of vehicles to measure its speed is common but needs a converter to change speed. Laser speed guns are limited to single point and instantaneous measurements. But a GPS receiver provides speed information in every second. Hence the use of a GPS receiver is essential. GPS receiver communication is defined by National Marine Electronics Association (NMEA) specification [10]. The idea of NMEA is to send a line of data called a sentence that is totally self-contained and independent from other sentences. Out of these sentences, GPRMC is the most common sentence transmitted by the most GPS devices. This sentence contains nearly everything a GPS application needs. Detection Procedure The GPS receiver acquires the GPRMC sentence in every second. From the GPRMC sentence, the speed information will be extracted by counting the number of comma (,) by the MCU. Two memory spaces will be allocated for the speed, one memory space for the time and another for the latitude and longitude. The latest time and latitude/longitude will be always saved in the memory overwriting the previous values.

The last two speed information will be always kept in memory. The latest speed information will be stored in the first memory space and will move to the second memory speed once new speed information is acquired. The MCU will compare the latest speed with the previous speed by utilizing the Equation (2). If the speed is less than the maximum speed found from Equation (2), the MCU will raise a flag to indicate that an accident took place.

3. Problem Statement

Dangerous sharp corners in the en route is predicted from Google API.Driver position tracked for every two seconds .Driver is warned 700 meters before the corner. Emergency services can be searched manually if needed. Dangerous sharp corners in the en route is predicted through Google API.Vehicle speed is calculated using GPS.Driver position tracking time interval is decided based on the vehicle speed.How long before alert tone produced for sharp corner is also decided based on vehicle speedOne touch emergency response is provided. Alert for Accident prone zones and school zoneswhich comes in the vehicle route

4.System Architecture

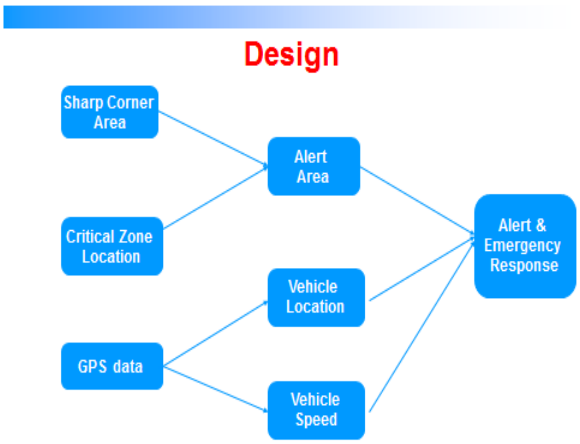

Figure 1: System Design

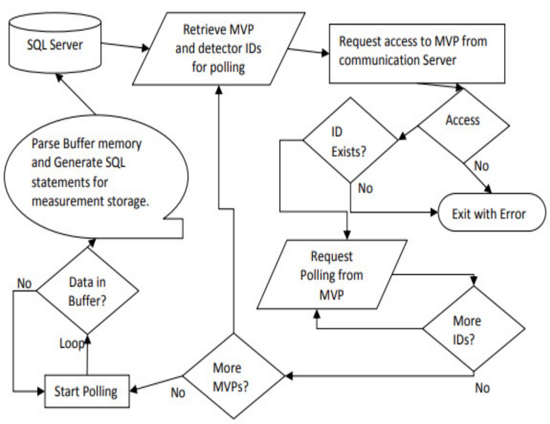

Figure 2: Architecture Diagram

6)Modules

- **Accident Detection**
- **Vehicle speed calculation**
- **GPS and GSM Module**
- **Sharp corner detection**
- **Alert Response**

ACCIDENT DETECTION

Accident detection is usedto prevent anunfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury and also event. The main purpose of accident detection is used to reduce the death ratio of a human and to provide the maximum assistance while accident occurs. The most common is the car speedometer this are used to point and instantaneous measurements. But a GPS receiver provides speed information in every second. This project addresses the common problem of reducing accidents in the road. The GPS device which is available in the present day smartphones is used to address the causes of road accidents. Specifically, our project addresses two common causes of road accidents which are over speed and lake of concentration. This project predicts the sharp corners and notify the user to reduce the speed thus solving high speed accident problems. Constant alerts regarding accident prone zones, school zones and rush junctions will help to reduce the lack of concentration problem. Independent from other sentences. Out of these sentences, GPRMC is the most common sentence transmitted by the most GPS

Vehicle speed calculation

Using basic time and location data, a GPS unit can quickly calculate the relative speed of the object, based on how much distance it covered in a given time. Convert the difference between the two latitudinal/longitudinal positions into a unit of measurement. Determine the difference between the two timestamps to calculate how long it took to get from Point A to Point Calculate the average speed based on these results.

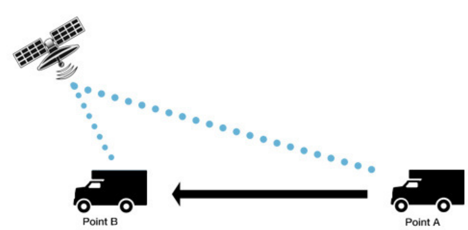

Figure 3:Vehicle speed calculation

GPS and GSM Module

GSM (Global System for Mobile Communications, is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones is shown in Figure 3. General packet radio service (GPRS) is a packet oriented mobile data service on the 2G and 3G cellular communication system's global system for mobile communications (GSM) where protocols means set of invisible computer rules that govern how an internet document gets transmitted to your screen and 2G is short for second-generation wireless telephone technology and provides advantages like to provide the services such as text messages

Sharp corner detection

This project addresses the common problem of reducing accidents in the road. The GPS device which is available in the present day smartphones is used to address the causes of road accidents. Specifically, our project addresses two common causes of road accidents which anover speed and lake of concentration. This project predicts the sharp corners and notify the user to reduce the speed thus solving high speed problems. Constant alerts regarding accident prone zones, school zones and rush junctions will help to reduce the lack of concentration problem.

Alert Response

The information sent as a GPRS data and SMS will be received by a GSM/GPRS modem connected to a computer. A middleware will be written to interpret the SMS and GPRS data. An appropriate program will be written so that Google Maps can be incorporated and the accident location is automatically plotted in the map utilizing the information from the interpreted SMS/GPRS data. The modem will also establish a voice channel with the Alert Response

Conclusion

This paper traffic provides solution for reducing traffic congestion it can be integrated part for smart traffic in smart city. The above results snow as how with the help of edge direction huge traffic congestion problems can be solved within minutes and at a very low cost and more over the traffic updates data received on user mobile will be a tremendous help to find the best route to his or her destination

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