Predicting Accident Prone Locations

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ABSTRACT

Every day a number of people die of road accidents all over the world. The severity of road accidents is more in densely populated countries. The asset of a country is their population and their health and safety is every countryâĂŹs top priority. The need of the hour is to ensure better road safety. So, we would like to propose a project that would help in decreasing road accidents and ensure better road safety.

1. INTRODUCTION

Road accidents occur mainly due to two reasons, one being human errors such as drunk driving, speeding, distracted driving, running Red lights, running Stop signs, teenage Drivers, night driving, design defects, unsafe lane changes, wrong-way driving, improper turns, tailgating, driving under the influence of Drugs, road rage, drowsy driving, street racing, etc.and many environmental factors such as fog, deadly curves, potholes, snow, ice, rain, etc. We would like to use the UK road accidents dataset to analyse and classify which locations are more prone to severe accidents. We will be taking into consideration numerous attributes which affects road accidents to predict the same.Our predictions could help people become aware of accident prone areas and take precautionary measures.

2. PROBLEM STATEMENT

When people travel to a new location, they are not aware of the surroundings and the precautions they must take while driving. If we can extract the information related to accident prone areas, it may help them to drive cautiously and safely. Also, this information will be helpful to the natives of that area to better understand their surroundings and take precautionary measures when passing by these accident prone areas.

Different causes of road accidents are explained below:

-> Speeding

Many drivers ignore the speed limit and drive 10, 20 and sometimes 30 mph over the limit. Speed kills, and traveling above the speed limit is an easy way to cause a car accident. The faster you drive, the slower your reaction time will be if you need to prevent an auto accident.

-> Rain

If the weather gets bad so do the roads. Car accidents happen very often in the rain because water creates slick and dangerous surfaces for cars, trucks, and motorcycles and often causes automobiles to spin out of control or skid while braking.

-> Teenage Drivers

Youth is wasted on the young, but careful driving is never wasted on young drivers. Unfortunately, teenagers arenâĂŹt often known for their carefulness. When teen drivers hit the roads they donâĂŹt always know what to do and that lack of experience ends up causing car accidents.

-> Night Driving

Driving in the daylight can be hazardous, but driving at night nearly doubles the risk of a car accident occurring. When you canâĂŹt see whatâĂŹs up ahead you donâĂŹt know what to anticipate as you drive towards it. As the sun goes down, your awareness of the road and cars around you must go up.

-> Ice

YouâĂŹre driving down the road, itâĂŹs dark out and you want to get home for the warm fire. Next thing you know, youâĂŹre car is spinning dangerously out of control because you hit black ice. While San Diego hardly ever has ice, ice is a major cause of car accidents for cities with cold weather climates.

-> Snow

SnowâĂŹs dangerous mixture of ice and water is a dangerous recipe for car accidents each winter storm. Like ice, snow is not something you usually encounter when driving in San Diego. Cities with cold winters know all-too-well just how dangerous snow can be for commuters.

-> Fog

Fog isnâĂŹt the most common weather occurrence, and thatâĂŹs good news for car accidents statistics. Driving is a skill that requires the ability to see, but fog makes it extremely difficult to see sometimes more than a car length in front of you.

-> Deadly Curves

Some people call them dead manâĂŹs curves, but everyone should be careful when approaching a curve. Many motorists have lost control of their cars along a dangerous curve and lost their lives in a car accident.

-> Animal Crossings

While drivers are required to know the rules of the roadway, wild animals do not take driverâĂŹs education. Wild animals will wade out into the street, and itâĂŹs up to you to make sure that you donâĂŹt get into a car accident with them. Taking appropriate decisions when seeing an animal crossing sign is extremely important. [2]

3. BACKGROUND

According to global statistics,

-> Almost 1.3 million people die in road crashes each year, on average 3,287 deaths a day.

-> An additional 20-50 million are injured or disabled.

-> More than half of all road traffic deaths occur among young adults ages 15-44.

-> Road traffic crashes rank as the 9th leading cause of death and account for 2.2 percent of all deaths globally.

-> Road crashes are the leading cause of death among young people ages 15-29, and the second leading cause of death worldwide among young people ages 5-14.

->Each year nearly 400,000 people under 25 die on the world's roads, on average over 1,000 a day.

->Over 90 percent of all road fatalities occur in low and middle-income countries, which have less than half of the world's vehicles.

->Road crashes cost USD 518 billion dollars globally, costing individual countries from 1-2 percent of their annual GDP.

->Road crashes cost low and middle-income countries USD 65 billion dollars annually, exceeding the total amount received in developmental assistance.

->Unless action is taken, road traffic injuries are predicted to become the fifth leading cause of death by 2030. [1]

4. ARTIFACTS TO BE CREATED

Project phase and Tasks to be done are as follows:-

-> Initiating- In the initiating phase we will be storing the data in database and preprocessing data. We will be cleaning and formatting data.

->Analysis and Development- In this phase we will be analyzing the dataset and extracting and scaling the important features. After data pruning and feature selection, we will start implementing the algorithm. Data processing will be done using Spark and programming language used is python.

->Testing and enhancements- After the completion of implementation of algorithm, we will be testing with different datasets. Depending on the test results, if required we will do bug fixing and enhancements.

->Closing- A successfully running program with the desired results.

5. TEAM

We will be working in group of three namely Nandini Goswami(F16-IG-3007), Kavya Guruprasad(F16-IG-3008) and Sarita Bhateja(F16-IG-3003).

6. TIMELINE

-> Initiating:- We will be initially doing data processing in October 2nd week.

->Analysis and Development:- We will be doing analysis and development in the month of October and finish it till November mid.

->Testing and enhancements:-From November 15 we will start our testing and do enhancements if required.

->Closing :- Our entire project will be completed by December 1.

7. REFERENCES

[1] Annual global road crash statistics. Webpage.
[2] Top 25 causes of car accidents. Webpage.