

Predictive Analytics of Car Accidents in Seattle

1. Introduction

1.1. Background

Car accidents are common in the United States. The severity of them can vary from bumper-tail light collisions to life-threatening situations. It is estimated that in the United States 37,000 people die due to car accidents each year and 2.35 million are injured or disabled [1]. In year 2019, in the state of Washington, there were 103,347 total car accidents including 497 fatal ones, and in the city of Seattle, there were 10,315 total accidents and 22 fatal ones [2].

In addition to the cost of lives and injuries to the people involved, car accidents can also bring large financial costs. The total financial cost associated with car accidents is estimated to be \$230.6 billion each year in the U.S. [1]. According to another article [3], the average cost associated with fatal accidents is about \$1.4 million per death; the average cost associated with a non-fatal disabling injury is \$78,900; and the average cost associated with non-disabling injuries and property damage is \$8,900.

The causes of car accidents can be attributed to several factors such as road condition, weather condition, and human errors (e.g. speeding). Knowing the effects of different factors on the car accidents is a key to predicting and preventing potential accidents in the future.

1.2. Problem

In this study, we analyze the car accident data to explore the relations between the contributing factors and the severity of the accidents. We build models to predict the likelihood of an accident and the severity of it for a given set of input conditions.

1.3. Interest

As mentioned above, car accidents can result in bodily injuries to individuals and financial costs. Therefore, parties who may be interested in this study include: (1) individuals, who may use the study to reduce to risk of running into potential accidents, (2) insurance companies, who may use the study to predict the cost of insurance plans, and (3) governments, who may use the study to improve local infrastructures and build safer roads.

Reference

[1] Shubhankar Rawat, "USA Accidents Data Analysis," *Medium.com*, Feb. 21st, 2020
<https://towardsdatascience.com/usa-accidents-data-analysis-d130843cde02>

[2] "2019 Washington State Car Accident Statistics & Reports," <https://www.colburnlaw.com/seattle-traffic-accidents/>

[3] "What Is the Average Cost of a Car Accident," Aug. 26th, 2020,
<https://www.theintelligentdriver.com/2020/08/26/what-is-the-average-cost-of-a-car-accident/>