Predicting the Severity of Car Accidents

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October 07, 2020

1. Introduction

1.1 Background

Traffic accident numbers have inevitably been on the rise, due to population growth and an increasing number of vehicles on the road. In turn, this translates to challenges faced by the trauma centres in hospitals and the traffic police departments. Due to manpower constraints and logistics concerns, the optimal deployment of resources in quick time is largely dependent on the severity of the accident. Hence, having an accurate prediction of accident severity in quick time would have huge benefits.

1.2 Problem

This project aims to identify a highly accurate classifier that predicts the severity of car accidents in Seattle, USA, using only input features that were easily identified without much investigation on the accident site.

1.3 Interest

This project might be of interest to trauma centres in hospitals and traffic police enforcement. It may also provide some insight to researchers and policy makers within government bodies such as the Healthcare Authority and Land Transport Authority.

2. Data Source

Data for all traffic accidents that happened between Jan 2004 and May 2020 were provided by the Seattle Traffic Police Division. This includes all types of collisions. Each collision record has been given a Severity Code label (1 - Property Damage Only Collision, 2 – Injury Collision), which is the target our model will try to predict. The data also includes many attributes that might be useful inputs for prediction (see Table 1).

Table 1: Candidate predictors for car accident severity

Attribute	Description
ADDRTYPE	Collision address type: • Alley • Block • Intersection
COLLISIONTYPE	Collision type
PERSONCOUNT	The total number of people involved in the collision
PEDCOUNT	The number of pedestrians involved in the collision
PEDCYLCOUNT	The number of bicycles involved in the collision
VEHCOUNT	The number of vehicles involved in the collision
INCDTTM	The date and time of the incident
JUNCTIONTYPE	Category of junction at which collision took place
SDOT_COLCODE	A code given to the collision by Seattle Department of Transportation
INATTENTIONIND	Whether or not collision was due to inattention
UNDERINFL	Whether or not a driver involved was under the influence of drugs or alcohol
WEATHER	A description of the weather conditions during the time of the collision

ROADCOND	The condition of the road during the collision
LIGHTCOND	The light conditions during the collision