**UK Road Accidents**

**Risk Factors**

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## Introduction

## Problem definition and ideation

## The aim of this capstone project is to predict the severity (slight, serious, fatal) of personal injury accidents on public roads in the UK. Firstly, by training a supervised learning multi-class classification we aim to achieve this objective. Secondly, we plan to identify high risk factors from the labelled dataset which are essentially top predictor variables for the serious and fatal accidents thereby aiding multiple use-cases like preventive measures, alerting systems and validating injury claims as discussed in detail below. Lastly, the bigger picture purpose of the project would be to drive data-driven enhancement of the road and vehicle conditions that if executed correctly has the potential to save hundreds of thousands of lives by taking simple preventive measures.

## Target audience, stakeholder personification

## The intended target audience are stakeholders ranging from government public road department to the vehicle/health insurance firms where the risk factors pointed out by the model would enable the stakeholders to make data-driven decisions for road development planning and optimize insurance policy rates respectively.

## Some of the sample questions that the stakeholders would be seeking answers for and would help with their decision making:

## What causes most road accidents in the UK?

## What car is in the most accidents in the UK?

## Which color car has the most accidents in the UK?

## Where do most accidents happen in the UK?

## What type of roads have the most accidents?

## Which type of road is statistically the safest?

## What is the biggest cause of road accidents in the UK?

## What is the risk of dying in a car accident in the UK?

## What role does weather conditions play in the accidents?

## Intended use-cases and benefits

## The output of the project would focus on the following specific use-cases and attempt to hypothesize and/or form simulations for planning and optimizing for the above-mentioned stakeholders

## What are the key risk factors (road conditions, vehicle characteristics, any other) in road accidents?

## Can we accurately predict the severity of accidents given values for these factors?

## Could this be used to validate injury claim applications?

## What easy preventive actions could help in curbing the risk of more severe road accidents?

## Could authorities use monitoring and alerting systems to alert travelers when high-risk factors are evident?

## Data

## Data source used: UK Road Accidents (data.gov.uk, 2020)

## 2.2 Data frequency, duration: Yearly data from 2015-2019 (5 years)

## 2.3 Data entities (indexes): Accidents (acc\_id), Vehicle (veh\_ref, acc\_id), Casualty (cas\_ref, acc\_id, veh\_ref)

## Data variables: Please find below the variables listed for each of these entities

## 

Figure 1: Data - List of Key variables

## Data summary: Each row in the dataset essentially describes the circumstances of personal injury road accidents in the UK – the types of vehicles involved and the consequential casualties. The dataset is limited to include cases that were reported to the police and subsequently recorded using the STATS19 accident reporting form (assets.publishing.service.gov.uk, 2020). Thereby, damage-only accidents with no human casualties or accidents on private roads or car parks are not included in the dataset. Death figures are indicative of persons killed immediately or who died within 30 days of the accident. (Definition adopted by the Vienna Convention in 1968).

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## Methodology

## Results

## Discussion

## Conclusion

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