

BUSSINESS UNDERSTANDING

Car collusion or car accident one of the collision type in road accidents. According to corrigigan, despite collecting large quantities of traffic data transportation departments of all levels are unable to use such data to good effect. Founded in 2015 a start-up called OND could predict when and where accidents are most likely to happen. Officials could use such information to direct safety efforts at the stretches of road where the impacts could be the biggest. In the context of this research, some of the developed countries like US, UK governments could use the information generated from a prediction system with a neural network predicting the accident severity with the different critical traffic conditions on the way to journey. By prediction car accident severity improve the traffic safety measures .And implements the traffic rules accordingly by government better severity conditions.

Problem: Data that might contribute to determining the likeliness of a potential accident occurring might include information on previous accidents such as road conditions, weather conditions, exact time and place of the accident, type of vehicles involved in the accident, information on the users involved in the accident and o course the severity of the accident. **This projects aims** to forecast the severity of accidents with previous information that could be given by a witness informing the emergency services.

DATA SELECTION

The data is divided in 5 different data sets, consisting of all the recorded accidents in France from 2005 to 2016. The characteristics data set contains information on the time, place, and type of collision, weather and lighting conditions and type of intersection where it occurred. The places data set has the road species such as the gradient, shape and category of the road, the surface conditions and infrastructure. On the user data set it can be found the place occupied by the users of the vehicle, information on the users involved in the accident, reason of traveling, severity of the accident, the use of safety equipment and information on the pedestrians. The vehicle data set contains the follow and type of vehicle, and the holiday one labels the accidents occurring in a holiday. All data sets share the accident identifications number.

An initial analysis of the data was performed for the selection of the most relevant features for this specific problem, reducing the size of the dataset and avoiding redundancy, [click here](#). With this process the number of features was reduced from 54 to 28.

DESCRIPTION OF DATA

The dataset that resulted from the feature selection consisted in 839,985 samples, each one describing an accident and 29 different features.

These features where the following:

From the characteristics dataset: lighting, localization, type of intersection, atmospheric conditions, type of collisions, department, time and the coordinates which are described in the Kaggle

dataset here. In addition, two new features were crafted, date to perform a seasonality analysis of the accident severity and weekend indicating if the accident occurred during the weekend or not.

Regarding the places dataset, the selected features where: road category, traffic regime, number of traffic lanes, road profile, road shape, surface condition, situation, school nearby and infrastructure.

The users dataset was used to craft some new features: number of users: total number of people involved in the accident.

- Pedestrians: whether there were pedestrians involved (1) or not (0).
- Critical age: whether there were users between 17 or 31 years old. involved in the accident.
- Severity: maximum gravity by any user involved in the accident. Unscathed or light injury (0), hospitalized wounded or death (1)

The holiday dataset was used to add a last feature, labeling the accidents which occurred in a holiday.