PREDICTING ACCIDENT SEVERITY IN SEATTLE

USING MACHINE LEARNING ALOGRITHM

BACKGROUND

- More than 10,000 crashes per year in Seattle
- Average 20 people losing their lives
- Over 150 people suffering life-changing injuries

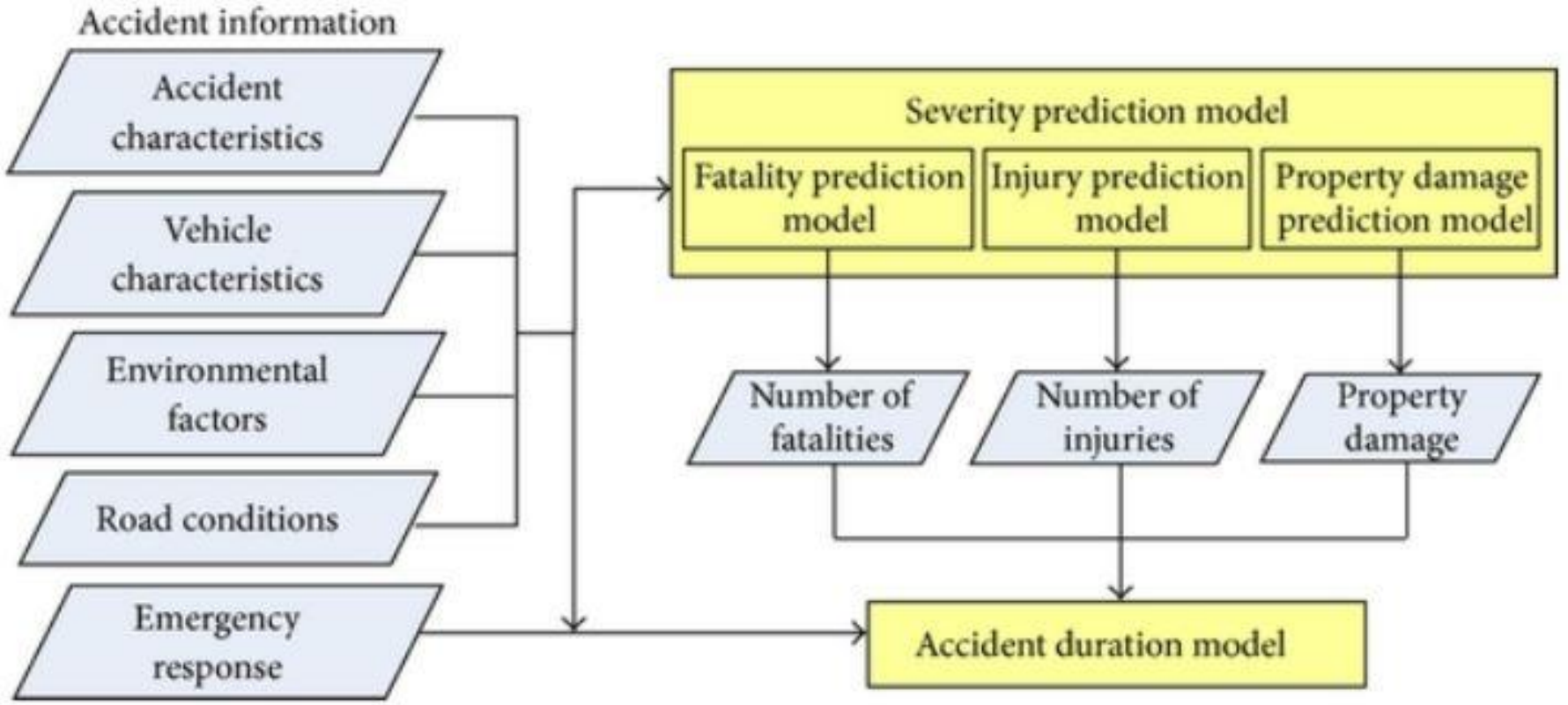
PROBLEM STATEMENT

In order to eliminate accident fatalities in Seattle, Seattle need to

- To predict the severity of accidents
- To identify the primary risk drivers affecting severity of accidents
- Take actions to reduce the impact

Hence, accident severity model is build using machine learning model

ACCIDENT FRAMEWORK



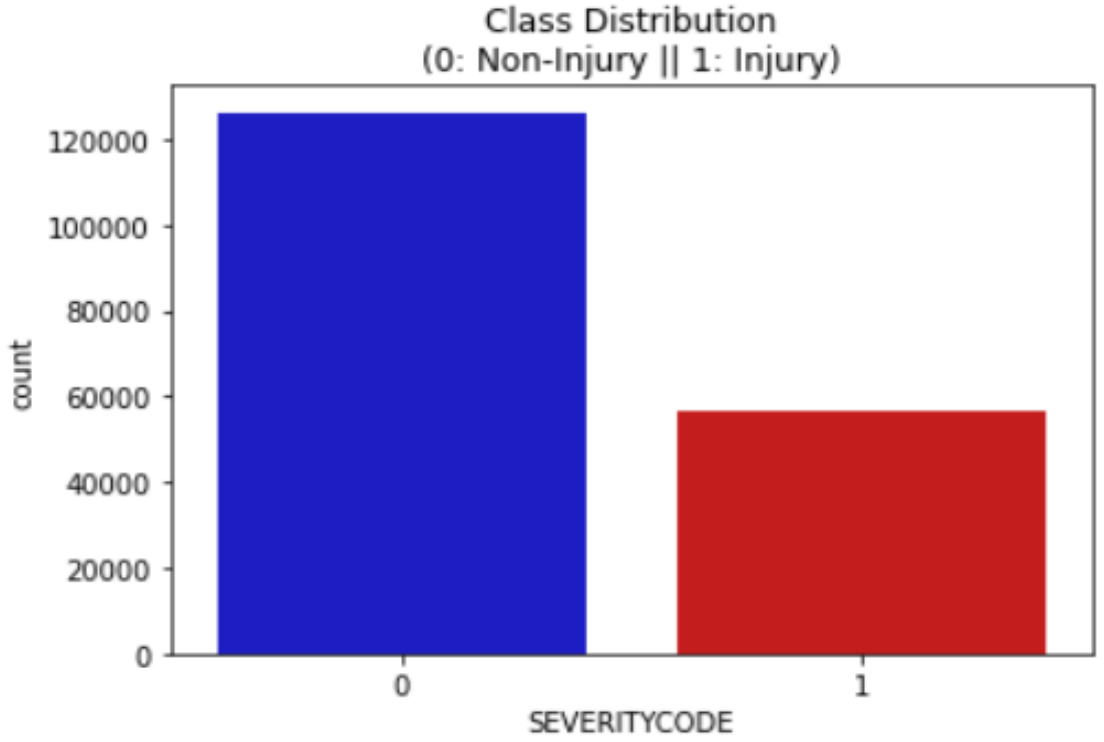
SEATTLE'S ACCIDENT DATA

From Seattle's accident data, which includes all collision types from year 2003 until now, the potential variables are listed below.

Attribute	Description
ADDRTYPE	Collision address type
COLLISIONTYPE	Collision type
JUNCTIONTYPE	Category of junction at which collision took place
INATTENTIONIND	Whether or not collision was due to inattention
UNDERINFL	Whether or not a driver involved was under influence of drugs or alcohol
WEATHER	Weather conditions during the time of collision
ROADCOND	The condition of the road during the collision
LIGHTCOND	The light conditions during the collision
PEDROWNOTGRNT	Whether or not the pedestrian right of way was not granted
SPEEDING	Speeding
HITPARKEDCAR	Whether of not the collision involved hitting a parked car
WEEKEND	Derived. To indicate weekend variables
STRUCKING VEH	To derive the strucking vehicle

OVERSAMPLING

There are 56,625 (30.96% of total) injury cases. Oversampling technique is employed to produce reliable result.



MODEL

Logistic regression is chosen due to its high discriminant power, simplicity and interpretability.

Algorithm	Jaccard	F1-score	AUC
LogisiticRegression	0.424295	0.668570	0.698715

DISCUSSION

Apart from accident characteristics, primary risk drivers are:

- Snowing/ Snowing road conditions
- Driver under influence of drugs or alcohol
- Speeding

REMEDIES

- Use de-icer to combat ice and snow.
- Establish weather forecast platform to remind drivers slow down
- Stiffer penalty and longer jail term for those speeding and driving under influence of drugs and alcohol