Traffic Safety:

Chicago, IL

Car Crash Data Analysis & Predictive Modeling

Christos Maglaras, Marcos Panyagua, Jamie Dowat

8%

*Increase in vehicle **fatalities** in 2020 alone.*

VISION ZERO CHICAGO

ADVOCATES FOR HIGHWAY & AUTO SAFETY

1,009 killed

IN **2019** MOTOR VEHICLE CRASHES

$10,885,000,000

ANNUAL ECONOMIC COST OF MOTOR VEHICLE CRASHES

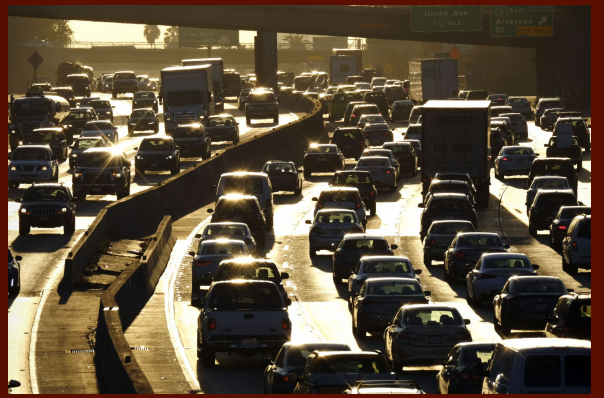
in ILLINOIS alone.

CDOT

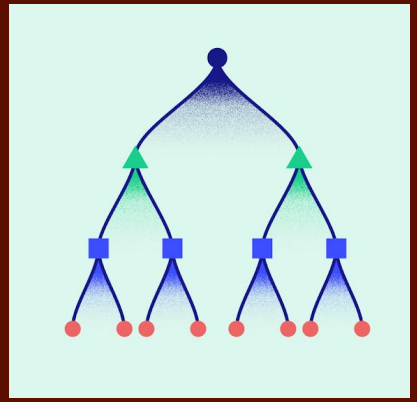
Road Quality

Driver Vision

Congested Areas



Predictive Model Outline:



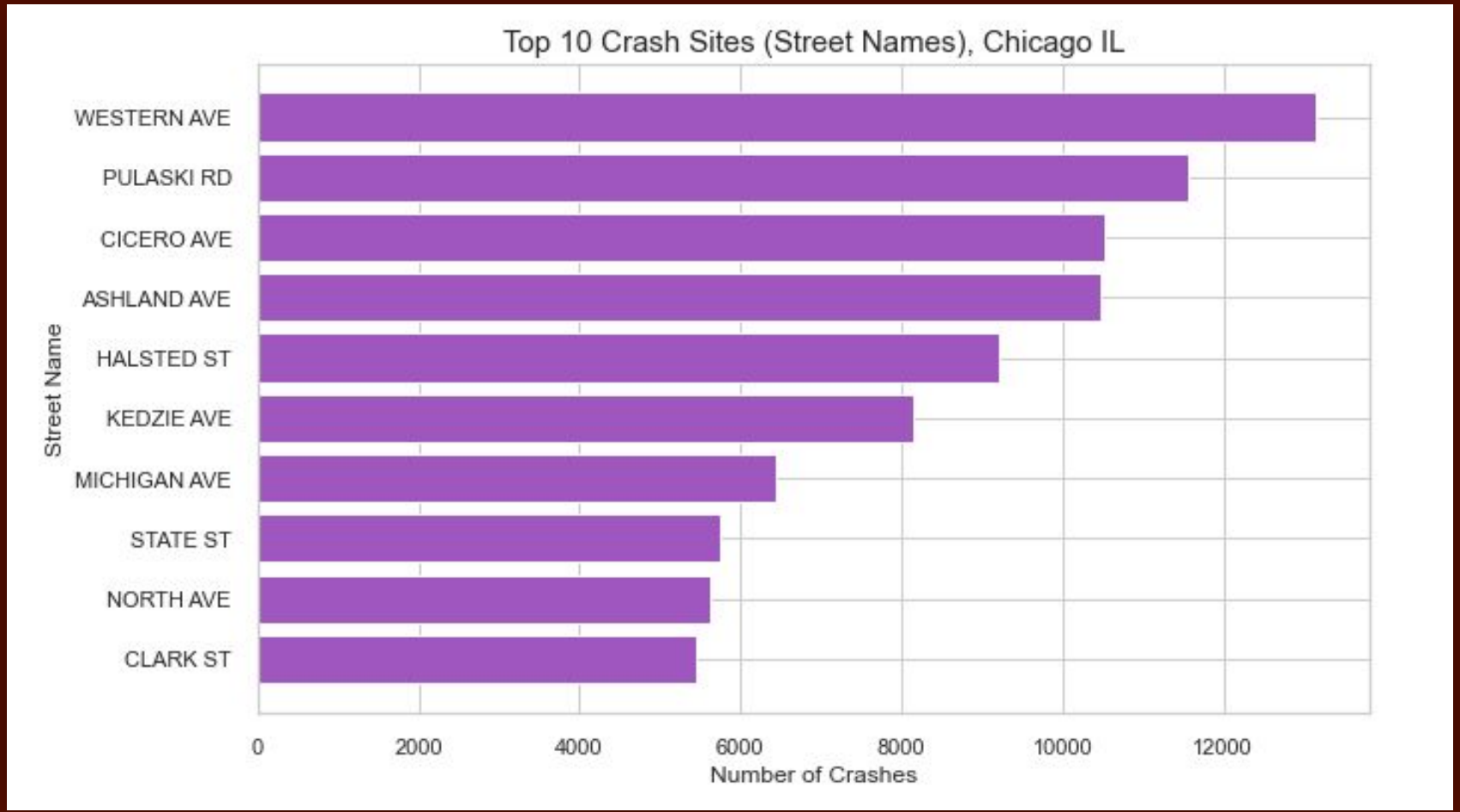
XGBoost Classifier Algorithm

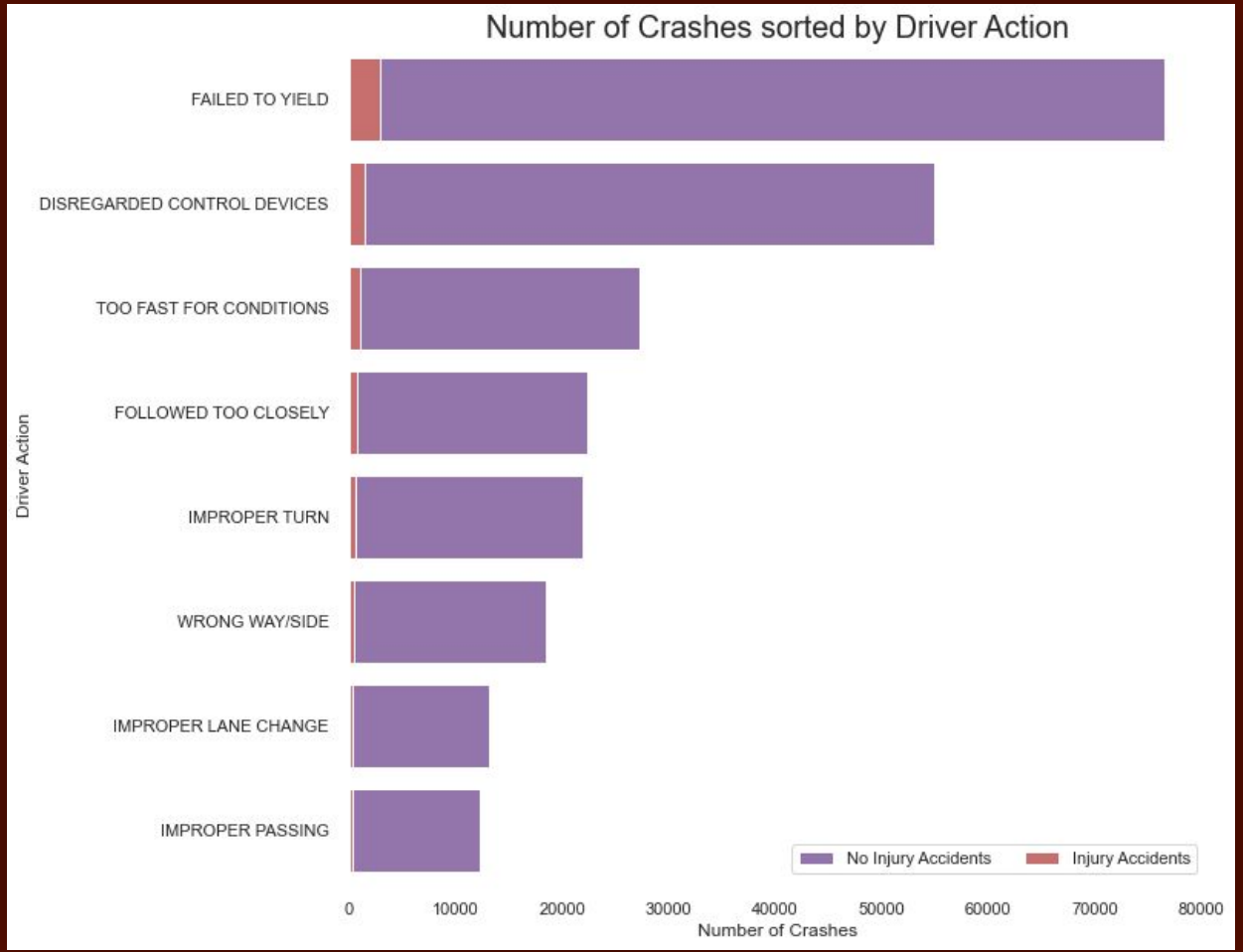
Data

~ 500,000 Crash Reports

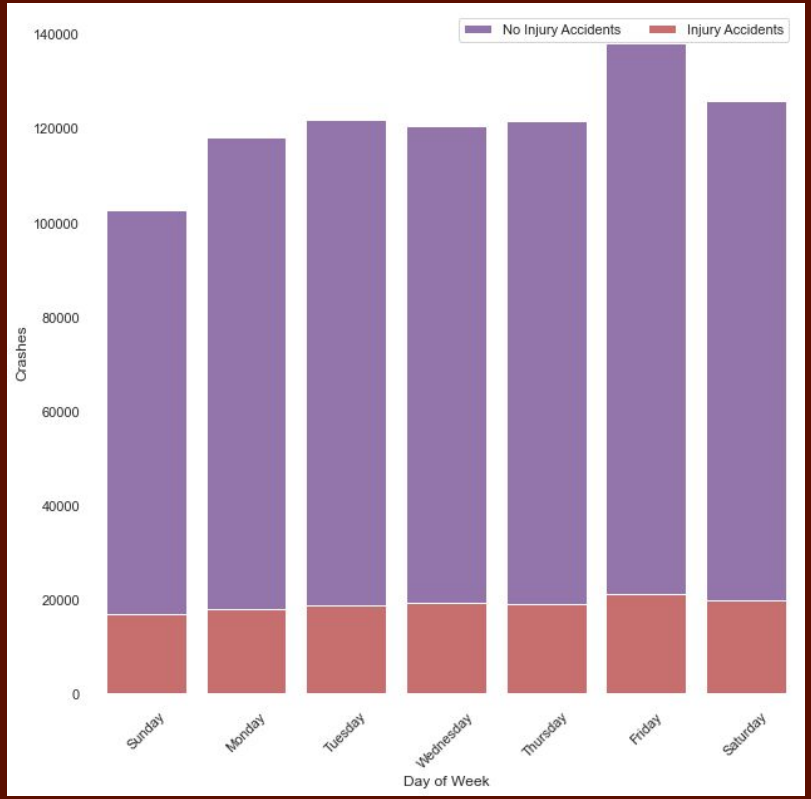
2013-2021

CHICAGO DATA PORTAL

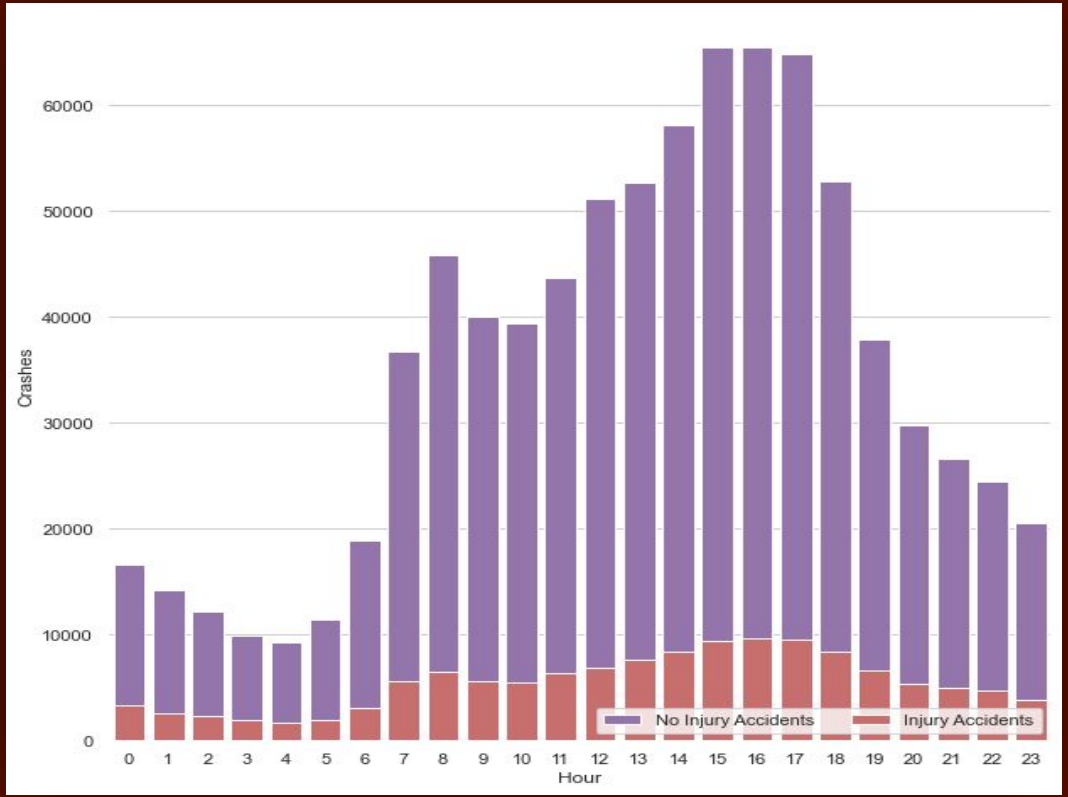

Top 10 Crash Sites (Street Names), Chicago IL
WESTERN AVE
PULASKI RD
CICERO AVE
ASHLAND AVE
HALSTED ST
KEDZIE AVE
MICHIGAN AVE
STATE ST
NORTH AVE
CLARK ST
Street Name
0
2000
4000
6000
8000
10000
12000
Number of Crashes


Number of Crashes sorted by Driver Action
FAILED TO YIELD
DISREGARDED CONTROL DEVICES
TOO FAST FOR CONDITIONS
FOLLOWED TOO CLOSELY
IMPROPER TURN
WRONG WAY/SIDE
IMPROPER LANE CHANGE
IMPROPER PASSING
Driver Action
No Injury Accidents
Injury Accidents
0
10000
20000
30000
40000
50000
60000
70000
80000
Number of Crashes

Car Crash Distribution:
Day of Week

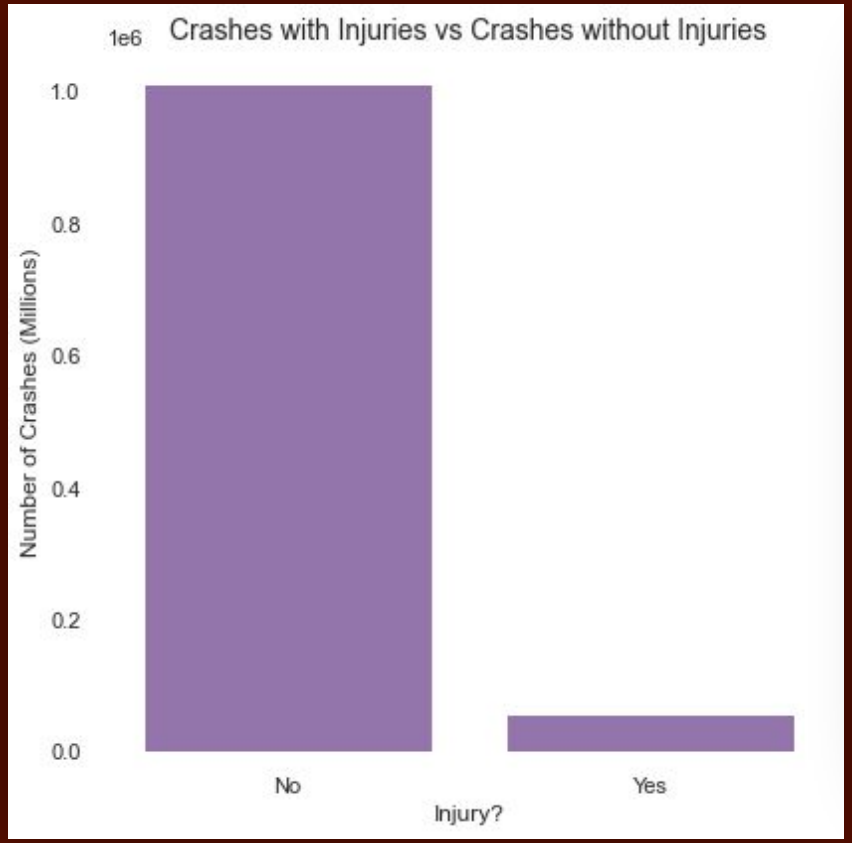


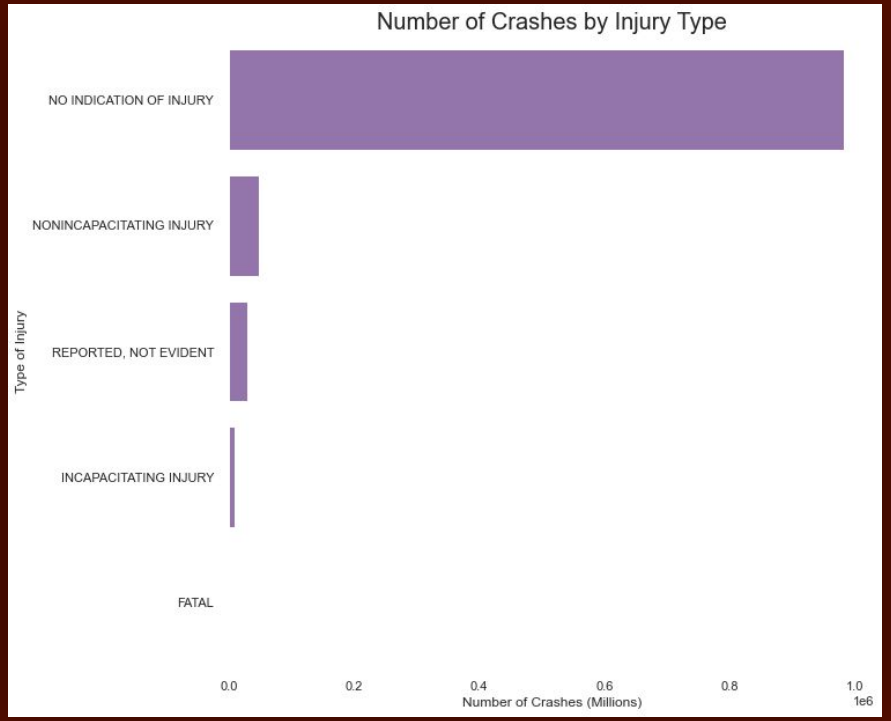
Car Crash Distribution:
Hourly



Predicting Car Crash Injury:

Class Imbalance





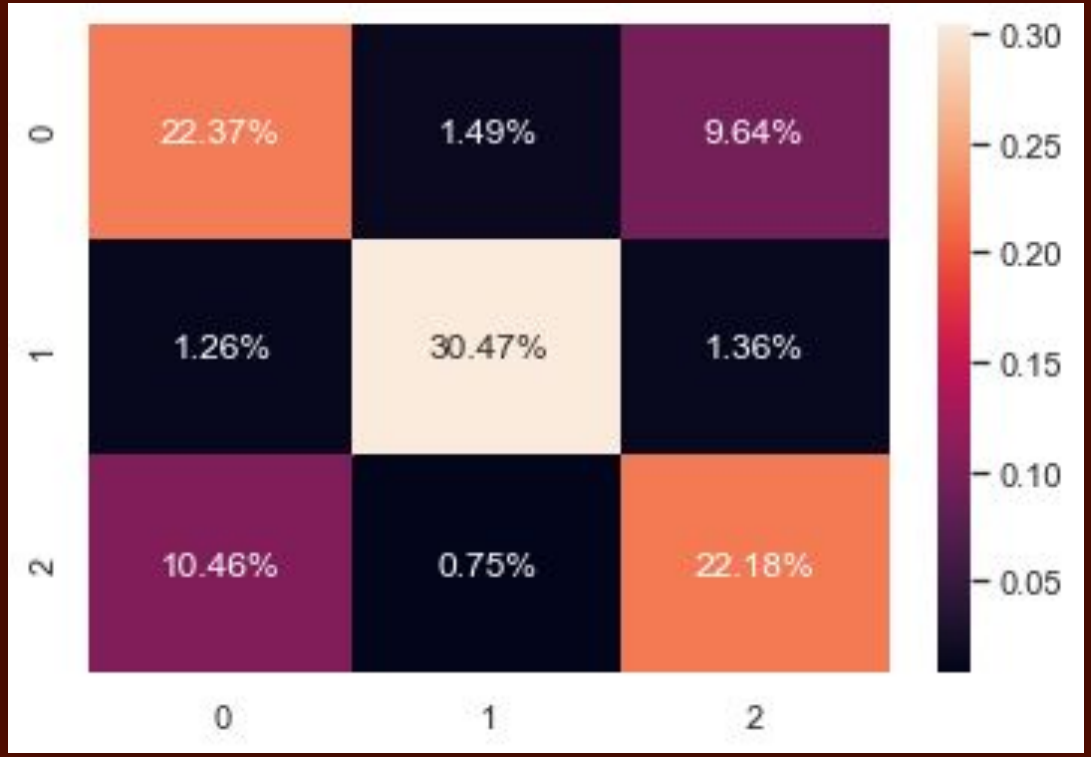
Modeling Car Crash Severity

Top 3 Features

Feature	"Gain" Metric
1. Number of Vehicles involved in Crash	~7
2. Posted Speed Limit	~6
3. If Car Crash Occurred on a **Holiday**	~5

Modeling Car Crash Severity

Model Performance

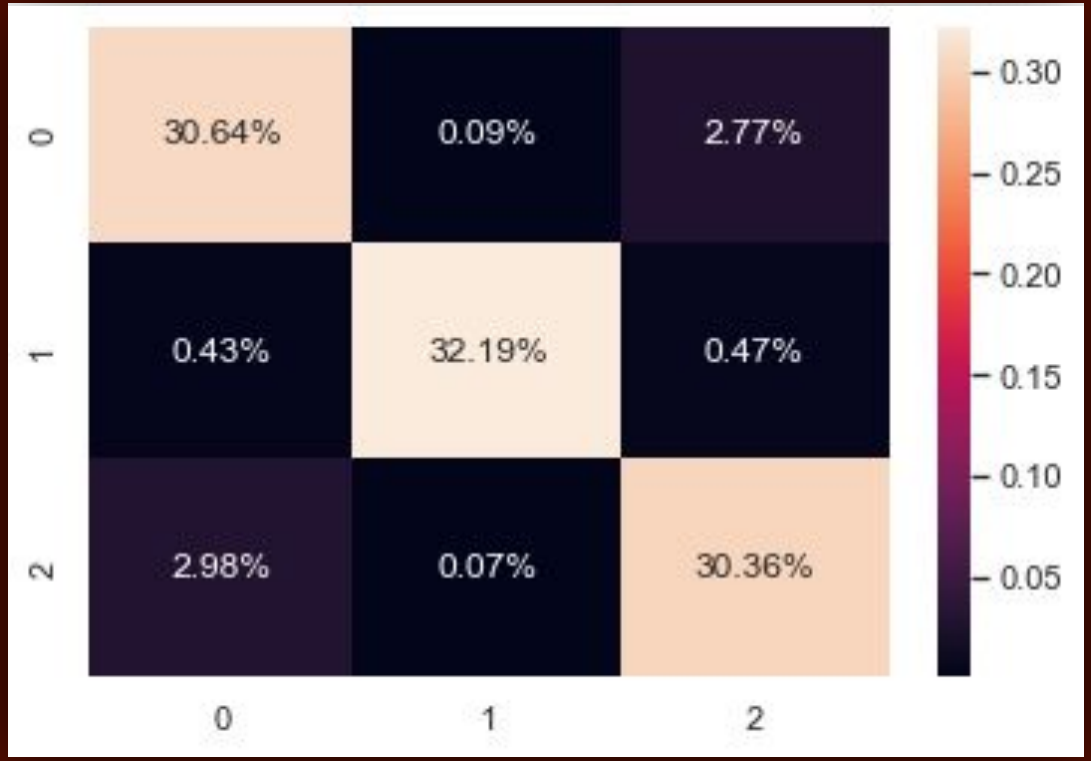


Recall (Test Data):

75%

Modeling Car Crash Severity

Model Performance



Recall (Test Data):

93%

Sources

- **Data Source** (City of Chicago Data Portal):
  - *https://data.cityofchicago.org/Transportation/Traffic-Crashes-Crashes/85ca-t3if*
- CDOT **Vision Zero** Initiative
  - *https://www.chicago.gov/city/en/depts/cdot/supp_info/vision-zero-chicago.html*

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