Ad-Sposure

Predicting Advertising Truck Exposure

Massy Farkhondeh

HaulerAds

Hauler Ads

- Provide billboards on trucks

- Wireless device
  - Unique identifier

Objective

- Predict the number of people exposed to advertising trucks in Ontario

Objective

- Predict the number of people exposed to advertising trucks in Ontario

- Enhance ads. campaign

Objective

- Predict the number of people exposed to advertising trucks in Ontario

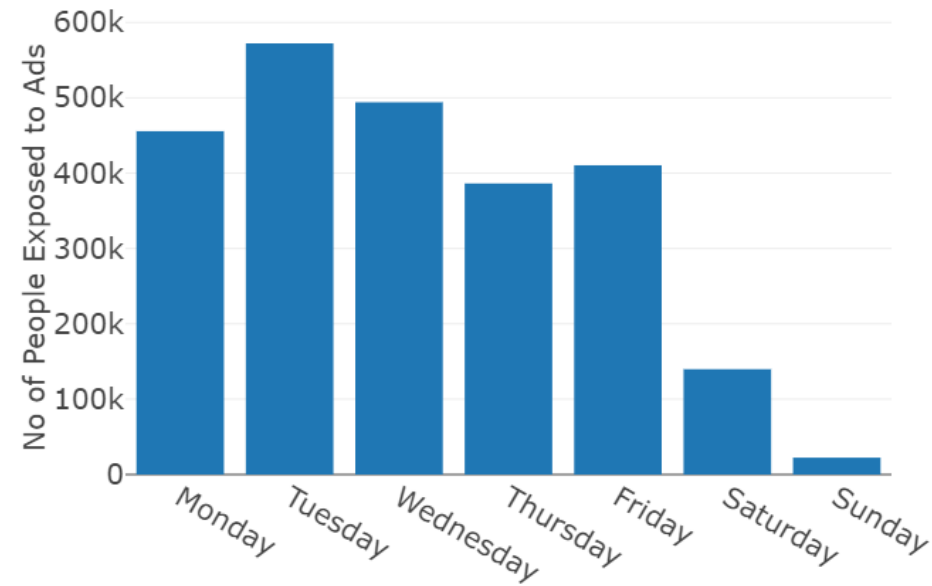- Enhance ads. campaign

Sell more ads. space
Estimate ads. cost

Data

- Data points ≈ 3M

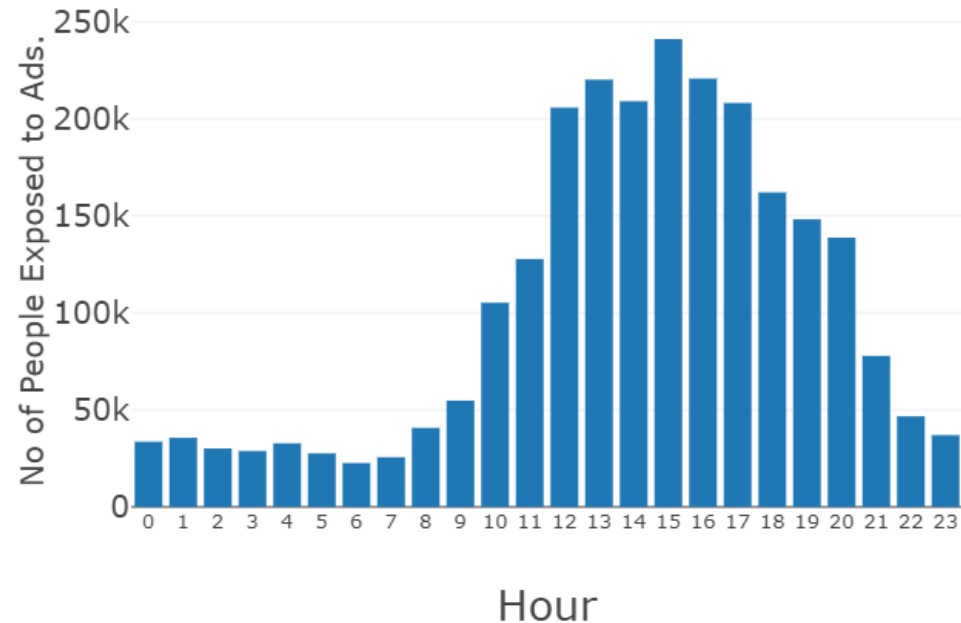- Delivery schedule and timelines not provided

Time	Lat.	Lon.	Truck#	Unique address	City	Weekday	Speed [km/h]
2019-04-20 13:18:31	43.6594	-79.6872	59	d4:e6:b7: db:94:5b	Brampton	Saturday	90

Overall Ads Exposure in Ontario

Week Day Exposure

Hourly Exposure

Exposure [29/4/2019]

Pipeline

X
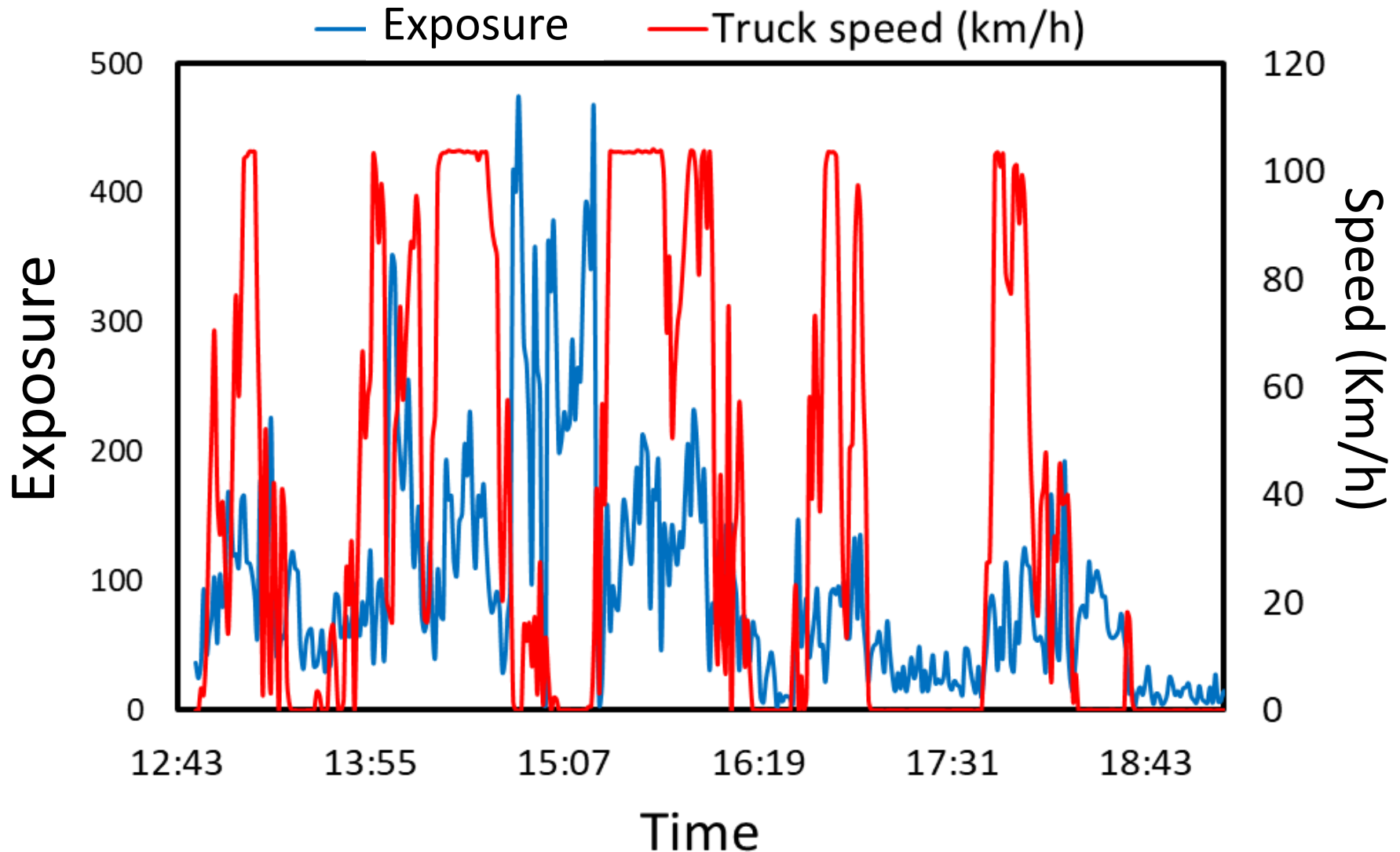
City

Day of Week

Time

Truck speed

Pipeline

X

City
Day of Week
Time
Truck speed

Y

Impression/h A, B, C, D, E, F

Class Imbalance

Oversampling

Pipeline

X

| City |
| Day of Week |
| Time |
| Truck speed |

One-Hot Encoding

Y

Impression/h A, B, C, D, E, F

Class Imbalance

Oversampling

Pipeline

X
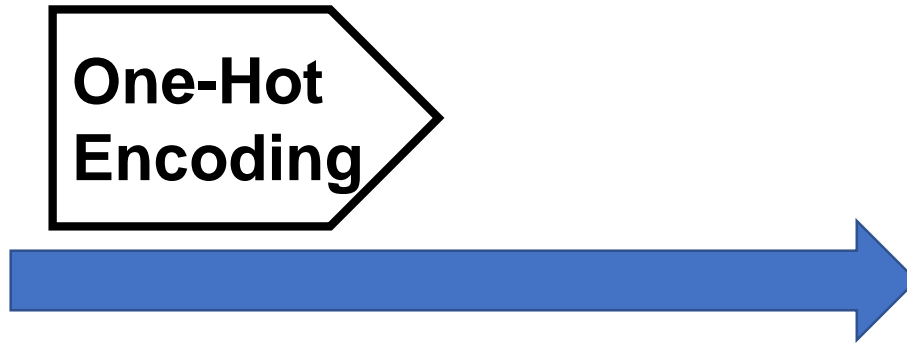
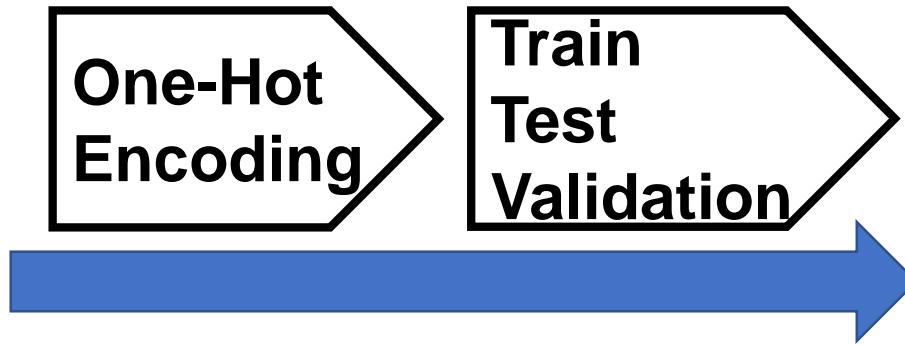| City |
| Day of Week |
| Time |
| Truck speed |

One-Hot Encoding

Train Test Validation

Y

Impression/h A, B, C, D, E, F

Class Imbalance

Oversampling

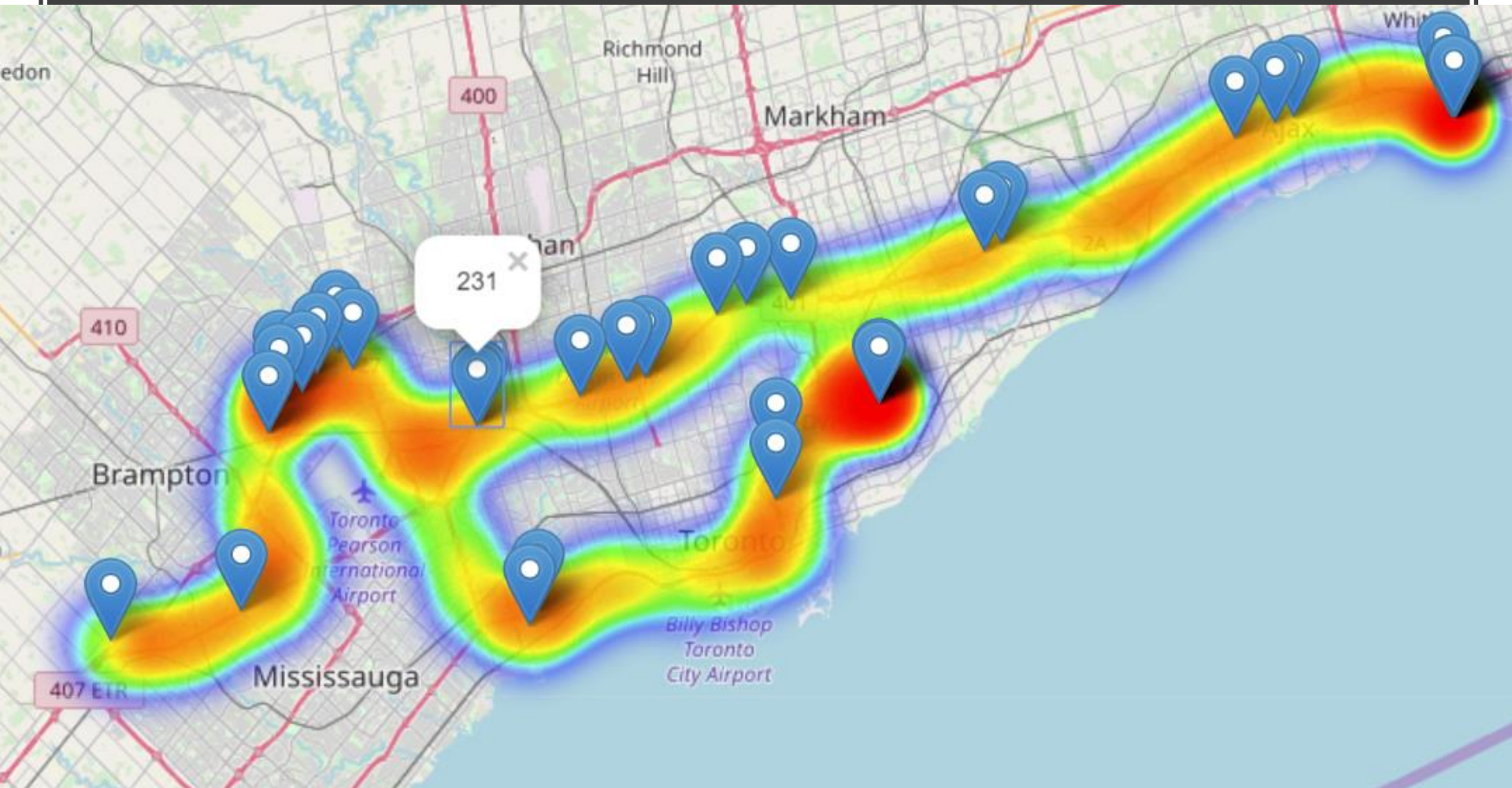# Random Forest Classification

❑Train, test & validation

- Model accuracy:

    87 %

❑Important features

- Truck speed

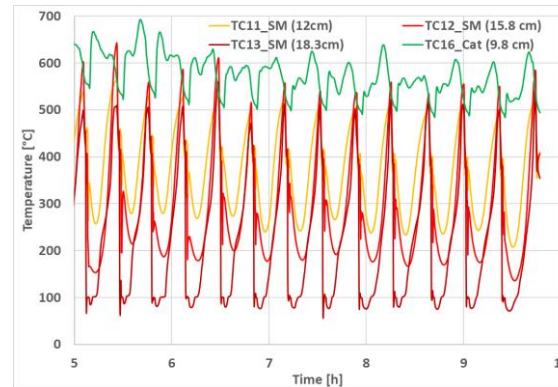- Time of day

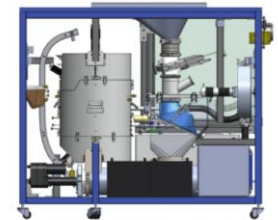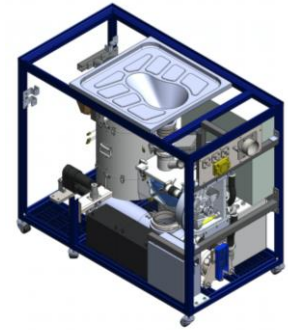# Interactive Heat Map

Recommendation

- ❑ Optimizing routes

- ❑ Time of exposure

- ❑ Number of trucks

- ❑ Weekend

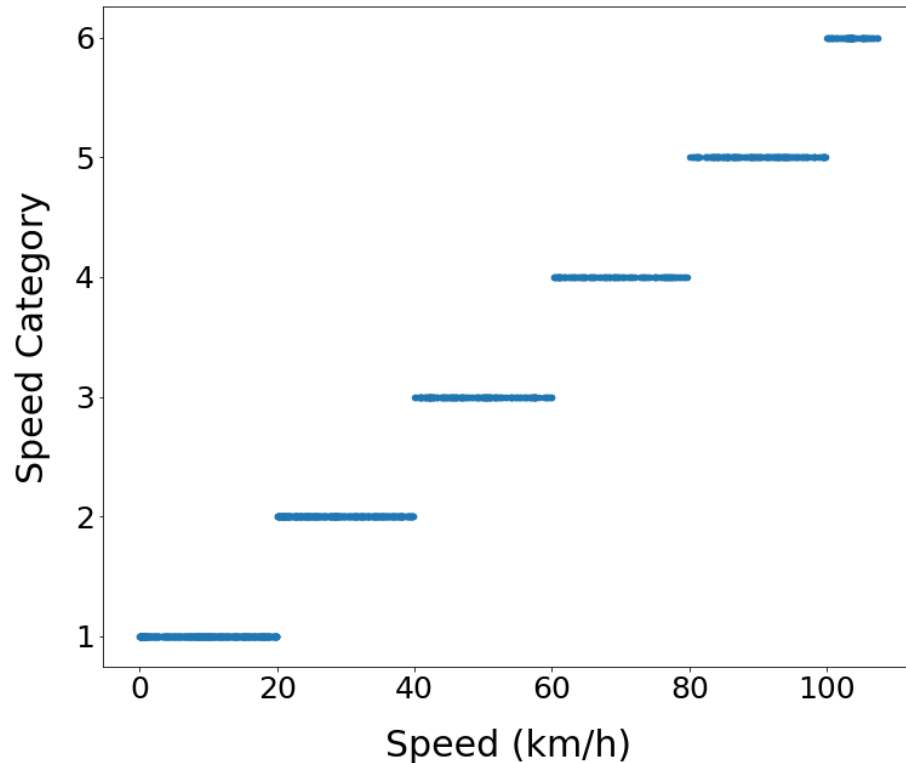# Massy Farkhondeh

PhD CHEMICAL ENGINEERING

SANITATION

MELINDA & BILL GATES FOUNDATION

APPENDIX

Truck Speed Category

Exposure

Random Forest Classification

LOW / HIGH — Normalized confusion matrix
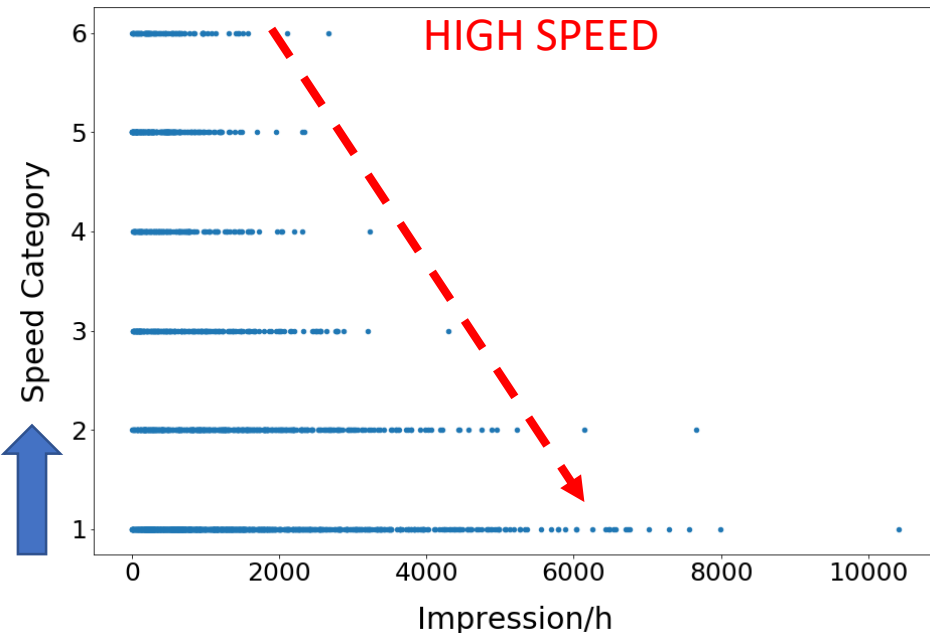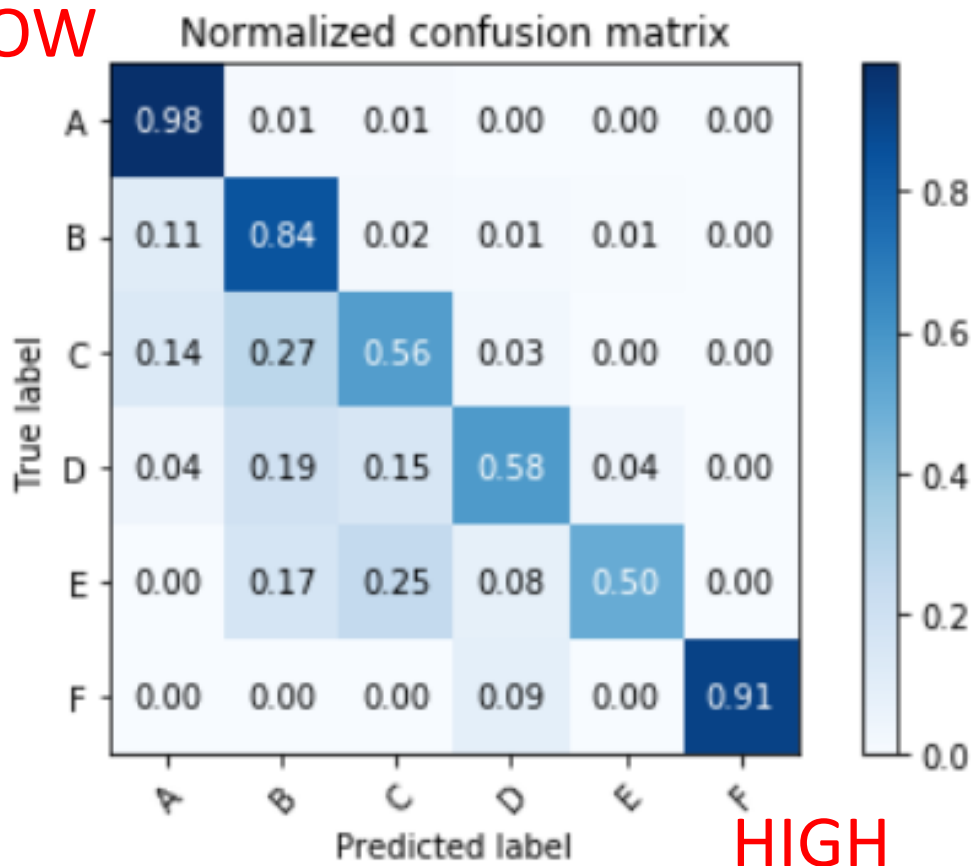
Category	Impression /h
A	0 − 1.3k
B	1.3k − 2.67k
C	2.67k − 4k
D	4k − 5.33k
E	5.33k − 6.67k
F	6.67k − 8k

Costing

Highway billboard

- 400k impressions in a month

- Costs $2000/period

Country road billboard

- 30k impressions in a month

- Costs $600/period

Truck Route [29/04/2019]