Predicting Aggressive Driving

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Problem Statement

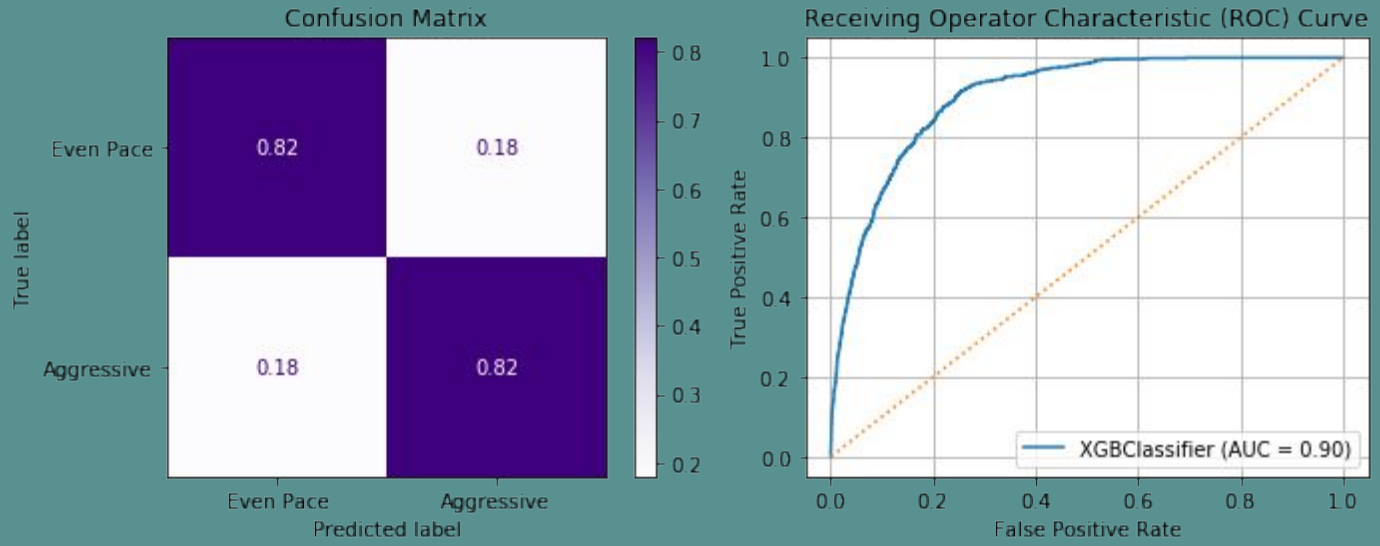
Traffic, Driving Style and Road Surface Condition Dataset which contains low-level parameters acquired by the cars OBD-II and through the micro-devices embedded in the user smartphone. The aim of this project is to build a classification model that can accurately classify a drivers driving style as "Even Paced" or "Aggressive". Having an effective model is important since it will be tracking the driving behavior in real time to predict if the driver is aggressive or not. With the use of this predictive model, a billing or savings strategy can be deployed to auto insurance companies in order to determine car insurance rates for there drivers based on the driving styles.

Traffic, Driving Style and Road Surface Condition

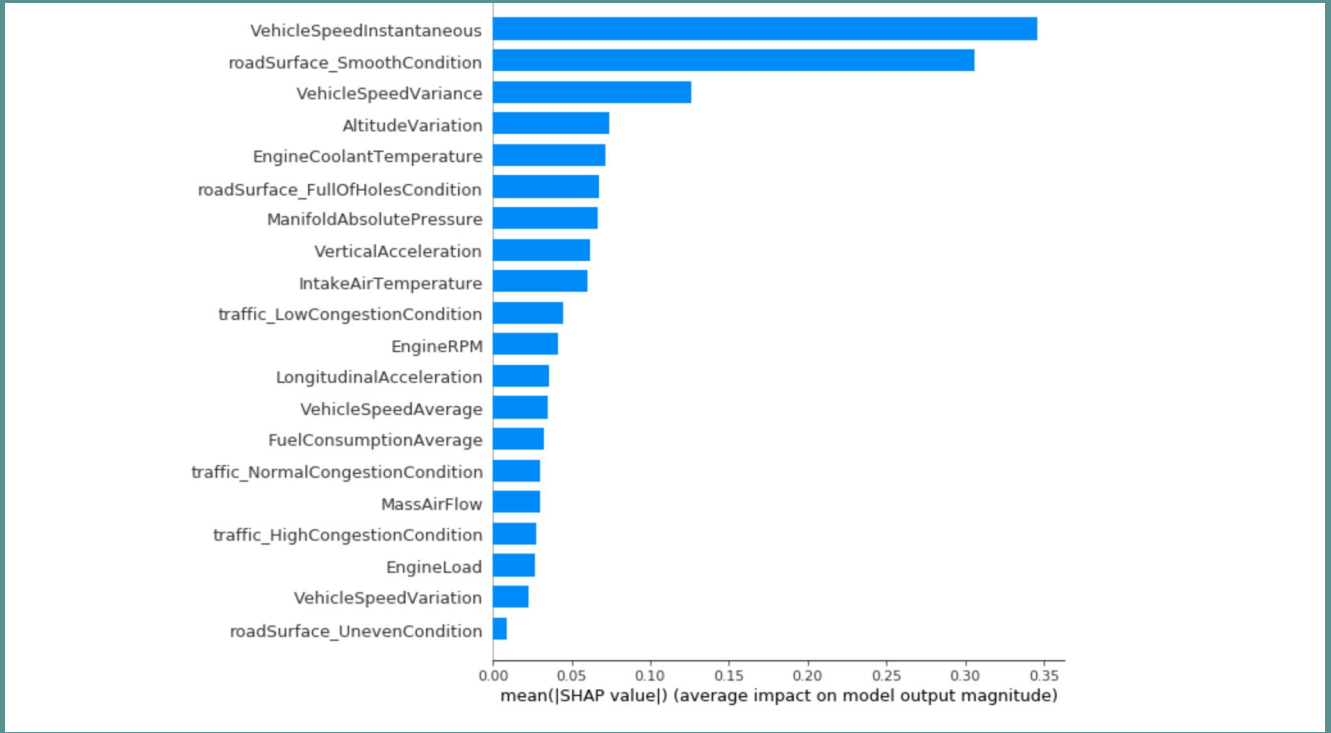
- Collected Data from Over 24,000 Car Parameters
- Analyzed 20 Unique Features.
- Imbalanced Dataset (92% Even Paced, 8% Aggressive)

MODEL

- Created a model using XGBoost.
- Model was able to predict Aggressive driving 82% of the time.

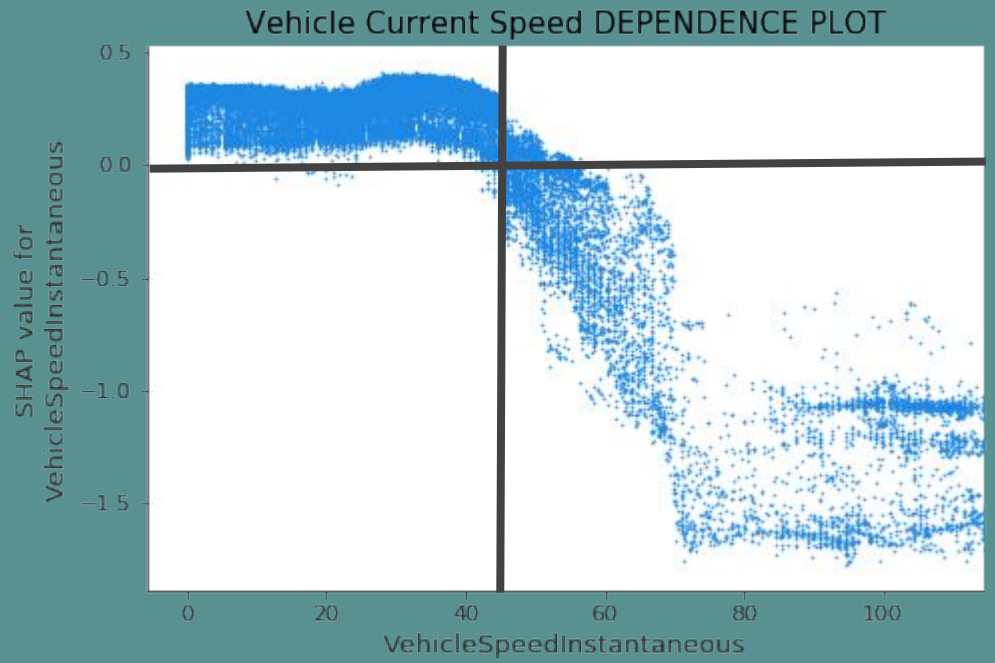


IMPORTANT FEATURES USING SHAP



VEHICLE SPEED DEPENDENCE PLOT

Speeds over 40 Mph negatively impacts the model because it becomes hard to tell if the driver is aggressive or not. That would be the threshold for the model predictions strength but after 60 mph this feature becomes irrelevant.



CONCLUSION/Recommendations

Engine Load - Pay attention to higher percentages of engine load that will be predicted as aggressive driving and driver premiums should be higher.

Average Fuel Consumption - Distance traveled and amount of fuel consumed. The higher fuel consumption will not be predicted as aggressive driving so driver premiums should be lower.

Engine RPM- Higher RPMs will be predicted as aggressive driving so driver premiums should be higher.

Future Work

Add the following parameters to the data set

- Age and Gender.
- Average Steering Wheel Jerk and Braking Reaction Force.
- Different car types.

Thank You