

Terry Stop and Frisk Analysis

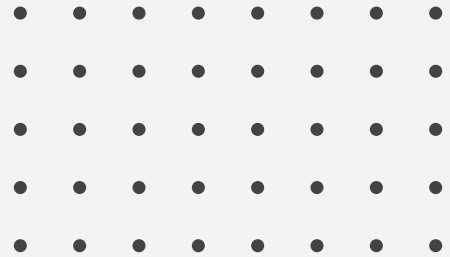
by Mel Friedman



Terry v. Ohio

- In 1967 three men were stopped by a policeman described to be in plain clothes.
- This stop resulted in the officer frisking the men based on his belief that they were suspicious and led him to find weapons on two out of three of the men.
- It was argued that this stop violated the men's Fourth Amendment right which protects people from unreasonable searches and seizure by the government.
- In an 8 to 1 decision it was deemed by the court that the officer did not violate the Fourth Amendment.

Goal of Analysis



Oftentimes, laws seem more black and white, or binary, but when a case is to be heard by a judge or jury emotions can get thrown into the mix for better or worse which can introduce bias even if they don't intend to.

The goal of this analysis is to limit the amount of bias and have a machine classifier be the judge of whether these recorded stops infringed on a person's Fourth Amendment right

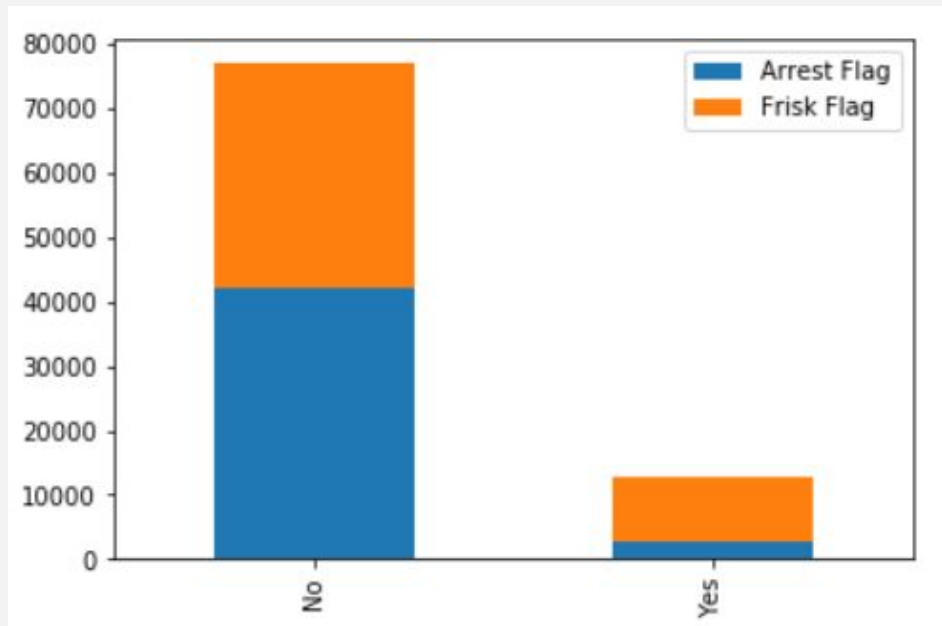
Data Used

Data was provided by the City of Seattle via the data.gov website.
Data provided was captured from 2017 through present date.

This data included information such as:

- Demographics for age, race, and gender
- Time and date of the stop
- Reasoning for the call/stop
- If a weapon was found on subject
- Result of the stop and if the subject was frisked or arrested

Frisk Flag vs Arrest Flag



Out of the the 44,849 stops reported, 2735 arrests were recorded.

However 10,104 times an officer frisk a suspect. This is approximately 27% that an officer frisking someone resulted in an arrest.

This means that 73% of the people that were frisked were innocent. Is this tactic effective if it is resulting in so little arrests? Are there other factors that could lead an officer to choose to frisk someone?

Models Used

Logistic Regression

A classification algorithm that provides outputs as a probability of a class between 0 and 1.



Decision Trees

A classifier where each internal node represents a choice between a number of alternatives, and each leaf node represents a classification.



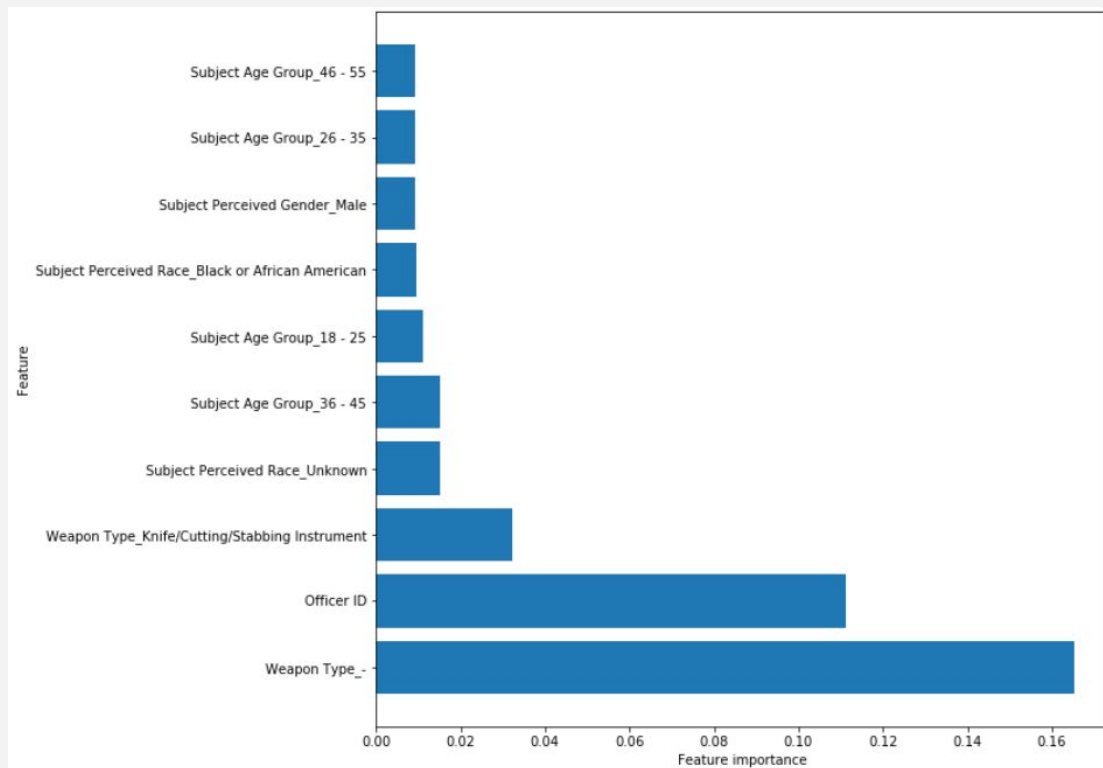
XGBoost

A stand alone library for gradient boosting algorithms that quickly performs advanced models.



Top Features

- Weapon Type
- Officer ID
- Weapon Type
(Knife/Cutting/Stabbing
Instrument)
- Perceived Race (Unknown)
- Suspect Age Group 36 - 45
- Suspect Age Group 18 - 25
- Suspect Perceived Race (Black or
African American)
- Suspect Perceived Gender (Male)
- Suspect Age Group 26 - 35
- Suspect Age Group 46 - 55



Preliminary Model Results

Accuracy is a calculation where the true positive and true negative are divided by the sum of the true positive, true negative, false positive, and false negative (total observations).

Logistic Regression

Accuracy of 95% and AUC of 0.53

Decision Trees

Accuracy of 93% and AUC of 0.61

Bagged Trees

Accuracy of 94% and AUC of 0.50

Random Forests

Accuracy of 94% and AUC of 0.50

XGBoost

Accuracy of 94% and AUC of 0.50

01

02

03

04

05

Final Model Used:

XGBoost



XGBoost showed consistently high accuracy, and being able to modify and adjust the parameters for further fine-tuning makes this model most favorable.

While some of the results of other models seemed similar, after further analysis it appears that they were overfit and therefore overperforming.





Data Recommendations

Because officer ID had a much stronger influence on the model, it may be important to evaluate the behavior of officers that appear more frequently in the dataframe. Their behavior may not be negative but more data on the officer will help future versions of the model's performance.

It also appeared that there may be some racial bias as well since being Black or African Americans had more influence on the model than any other race. Since this was one of the main concerns of this project and becoming more of a known issue with police abuse of power towards BIPOC, it is important to have more geographical data to determine if this is because these stops are located in a predominantly black neighborhood (which can also pose its own social issues) or if these officers had bias when making these stops.

If in fact there is racial bias coming from the officers in these reports, then retraining or termination may be necessary.

Future Work

- Adjust columns and bin for values (call type, resolution, weapon type)
- Use more data regarding time of day and frisk flag
- Further fine-tuning of parameters
- Gather a larger sample size with more geographic data

THANKS!

Github repo can be found here:

<https://github.com/melfriedman/FriskAnalysis>

Do you have any questions?

melfriedman27@gmail.com

or message me on slack 😊