ANATOMY OF A MADE SHOT

Predicting Kobe Bryant's Career "Makes"

By Ahmed El-Razi

CAREER SNAPSHOT

- 19 years
- 30,000+ shots
- 5 NBA Championships
- 3 Olympic Gold Medals

DATASET

- Career Shots
    - Made/missed
    - Court location
    - Opponent
    - Distance from basket
- 30,697 observations, 25 features

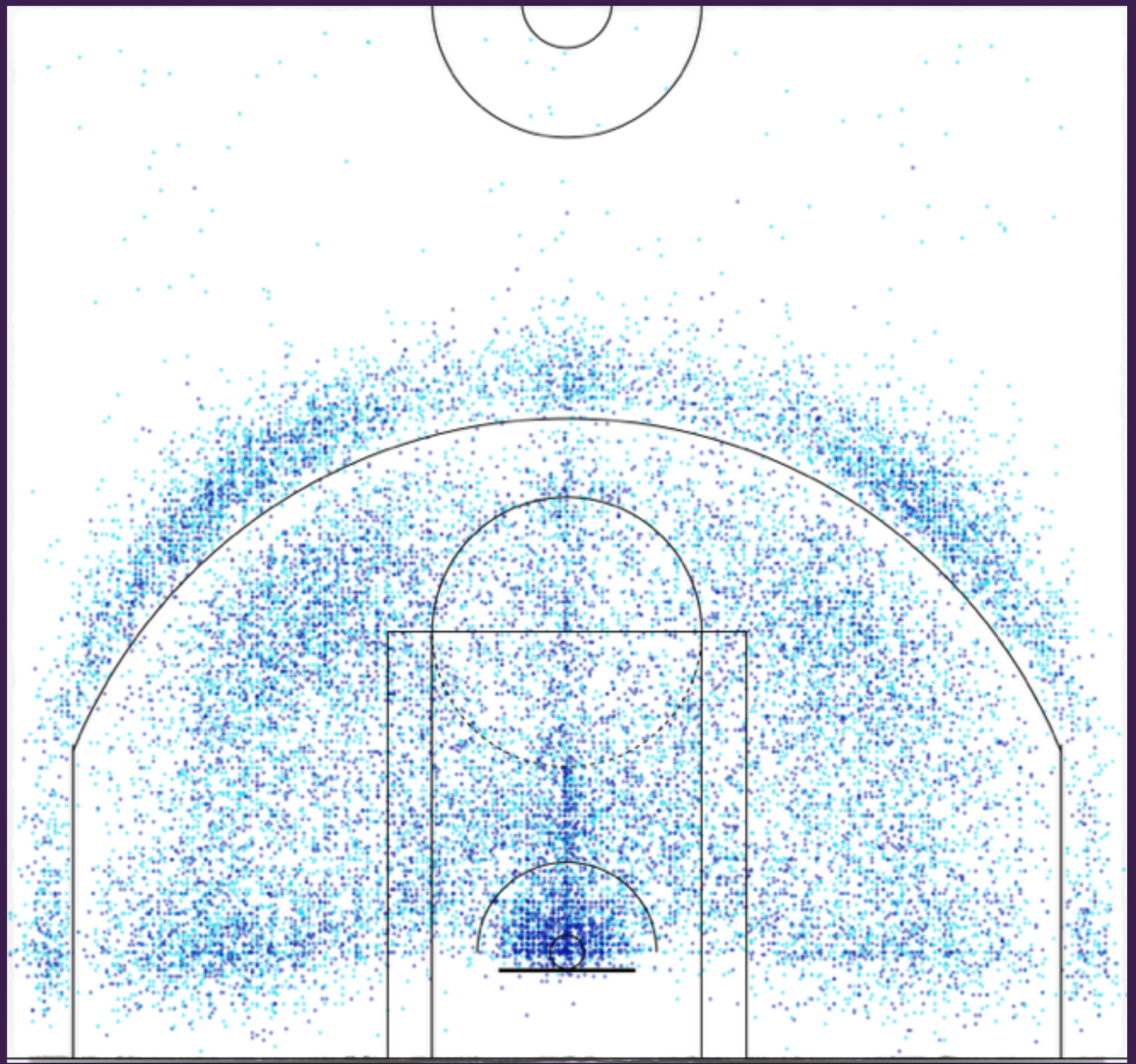
kaggle™

PostgreSQL

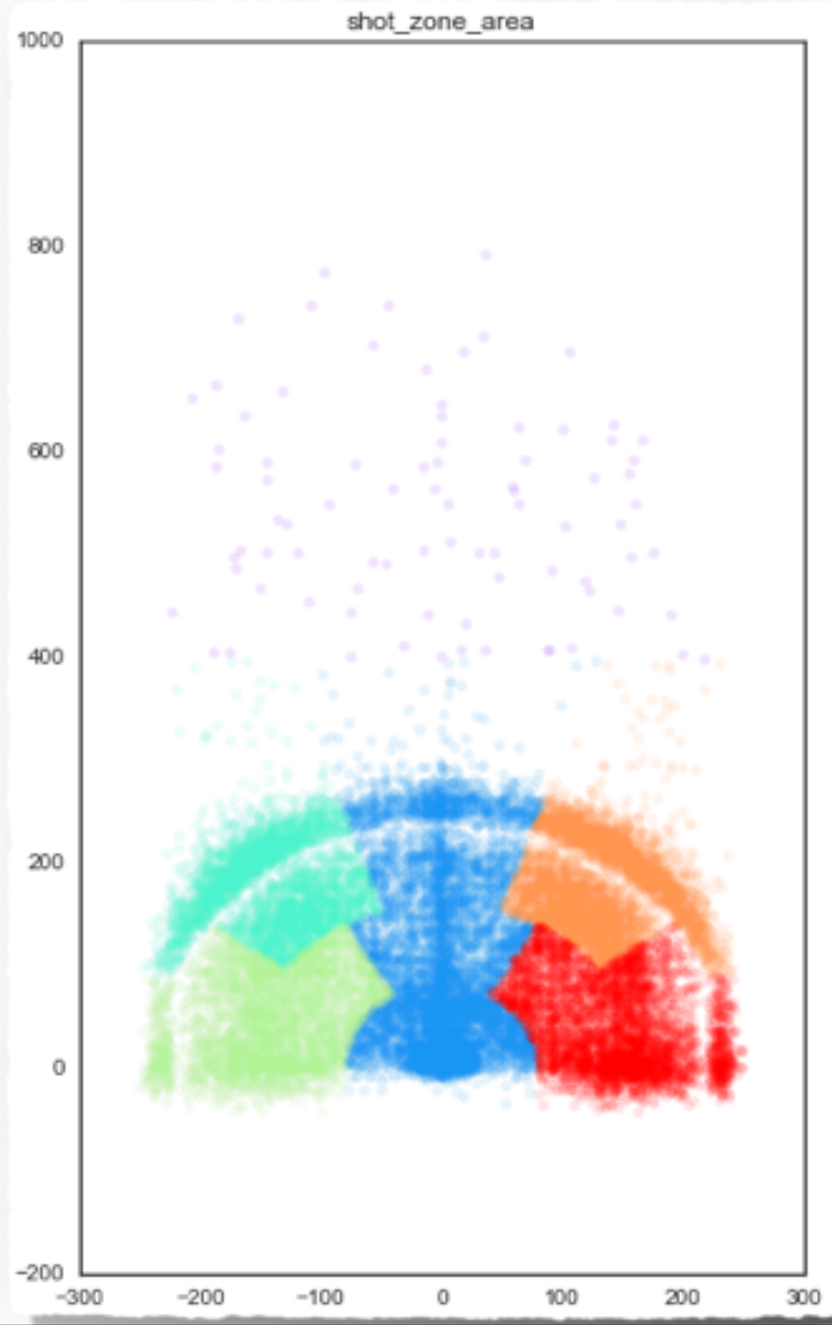
OBJECTIVE

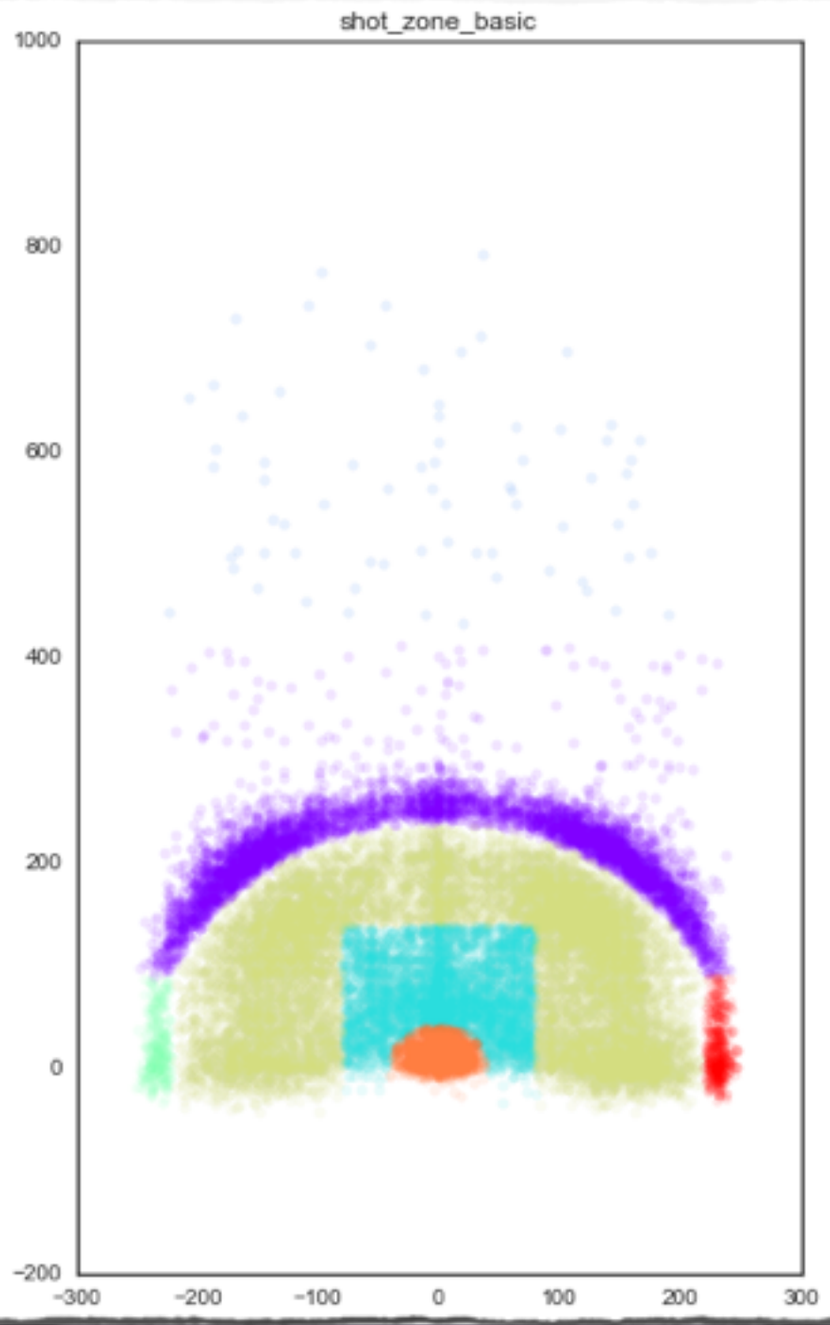
- Can we build a model to predict which shots Kobe Bryant will make?

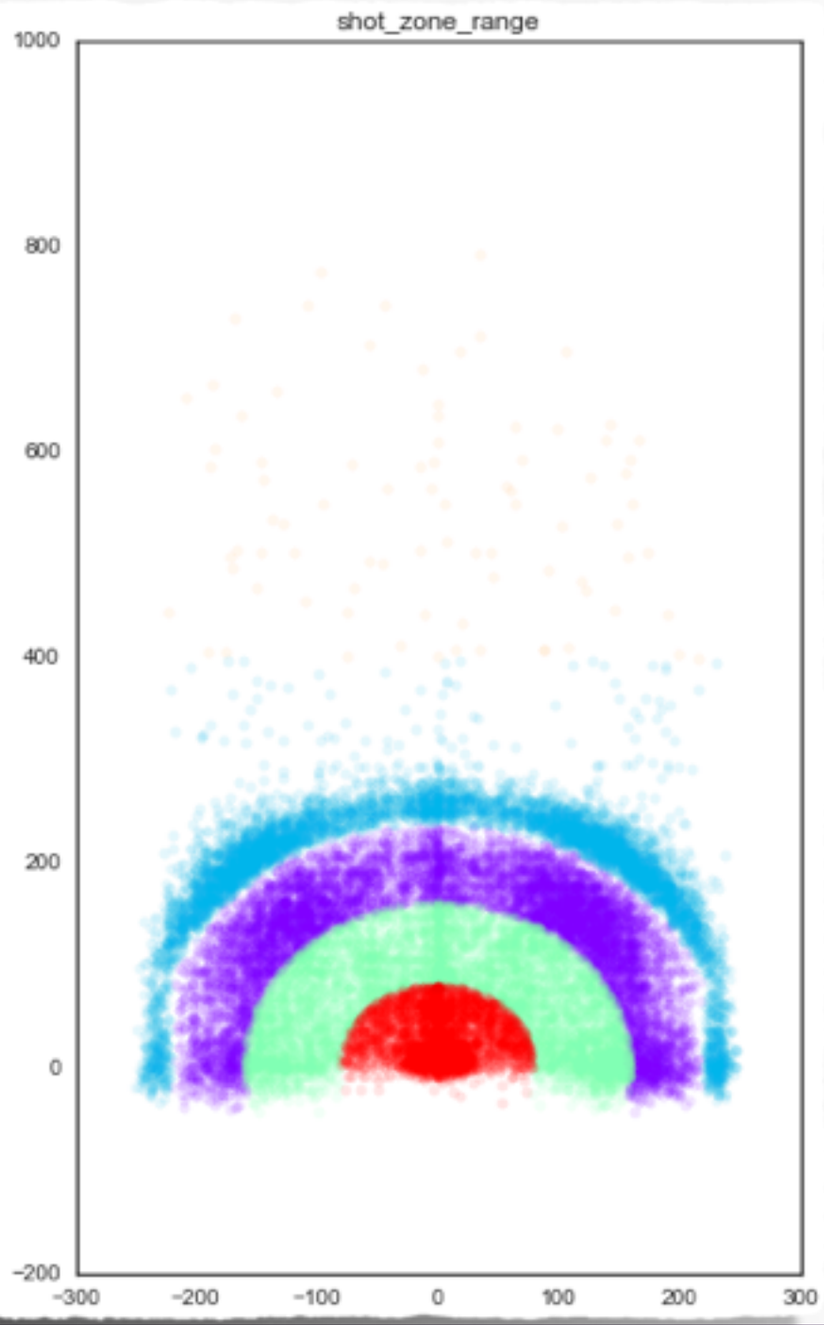
CAREER SHOT CHART



SHOT ZONES


shot_zone_area
1000
800
600
400
200
0
−200
−300
−200
−100
0
100
200
300


shot_zone_basic
1000
800
600
400
200
0
−200
−300
−200
−100
0
100
200
300


shot_zone_range
1000
800
600
400
200
0
−200
−300
−200
−100
0
100
200
300

MODELING

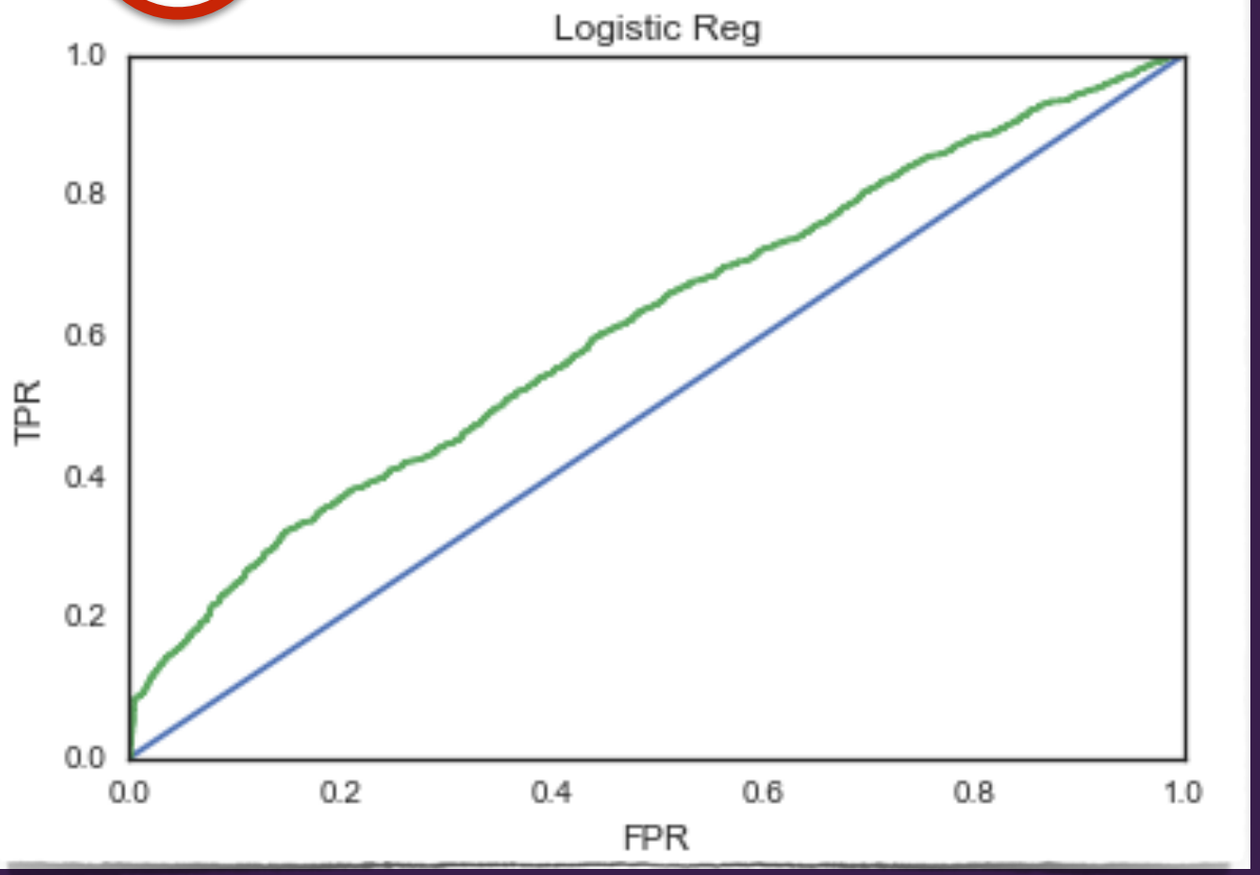
- Logistic Regression with RFE
- Random Forest with GridSearch (1000) estimators
- Features:

[shot type, shot distance, shot area, time remaining, opponent, period, game date, playoffs (binary)]

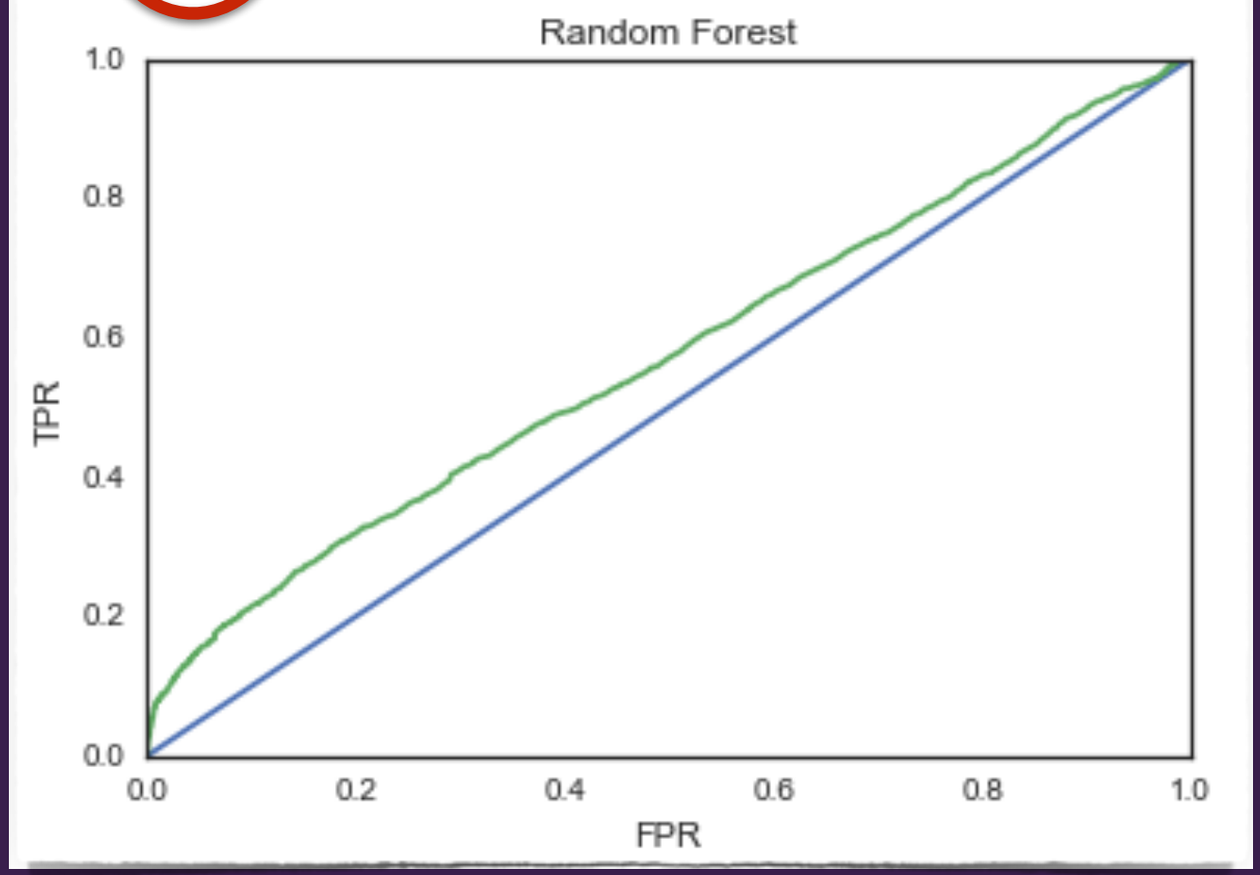
- RFE singled out shot type and shot area

LOGISTIC VS. RANDOM FOREST (AUC)

```
fpr 0.148822269807
tpr 0.320369281437
auc: 0.615266866084
```



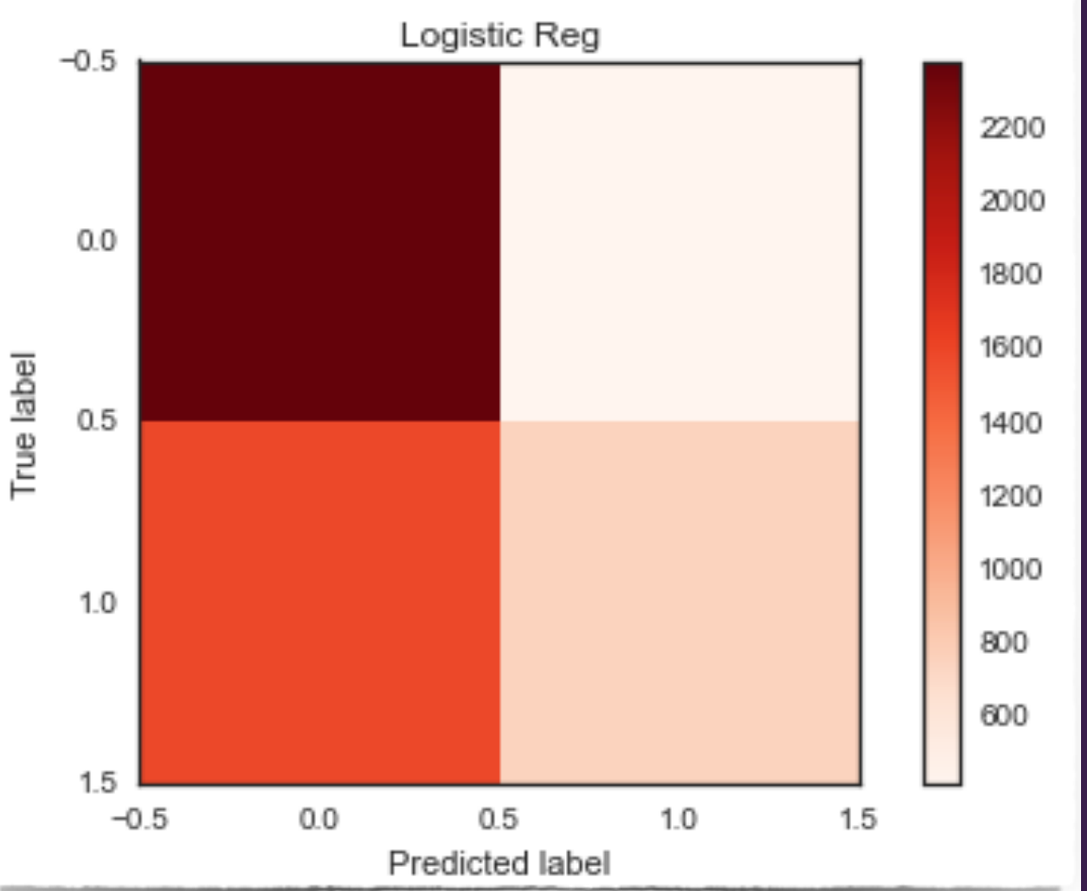

```
fpr 0.256245538901
tpr 0.365697177074
auc: 0.570899421713
```



LOGISTIC VS. RANDOM FOREST (PRECISION / RECALL)

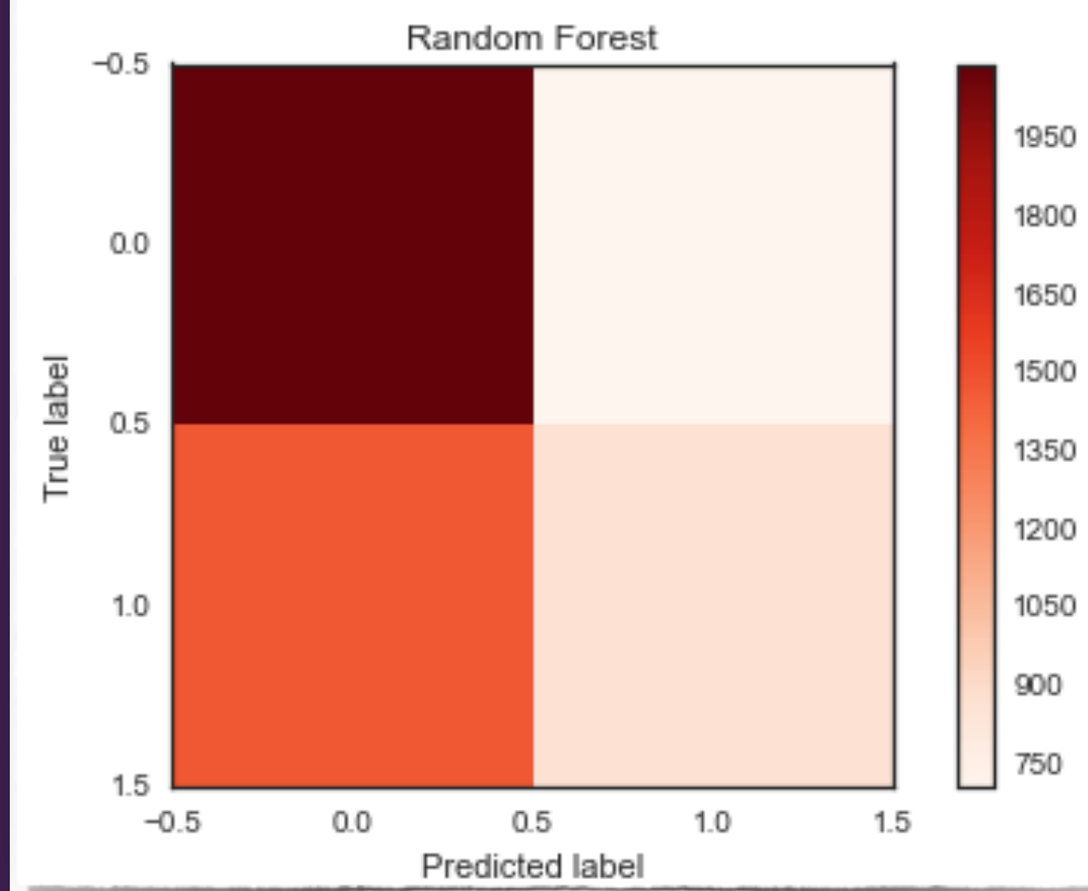
```
Training Data Accuracy:  0.62
Test Data Accuracy:      0.61
[[2385  417]
 [1589  749]]


Precision:               0.60
Recall:                  0.85
```




```
Training Data Accuracy:  1.00
Test Data Accuracy:      0.58
[[2094  708]
 [1472  866]]


Precision:               0.59
Recall:                  0.75
```

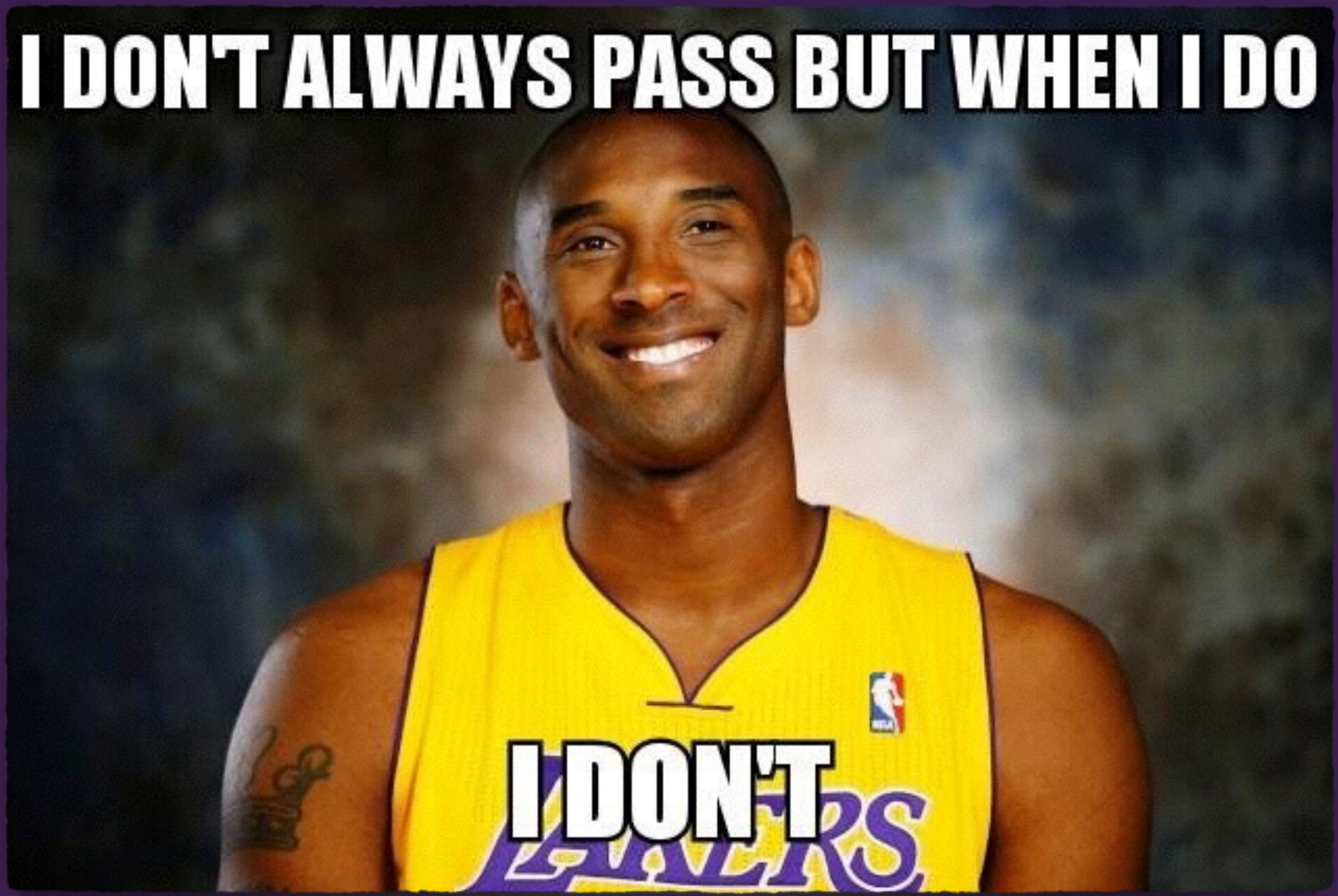


CONCLUSIONS

- Logistic model > Random Forest
  - ✦ Accuracy
  - ✦ Precision
  - ✦ Recall
- Overall predictive power: moderate
- Feature engineering to improve model

ACKNOWLEDGEMENTS

- Savvas Tjortjoglou (github.com/savvastj)

- Dixhom (github.com/dixhom)

THANK YOU