

# Predicting NBA Games for Sports Betting

Brandon Tahir



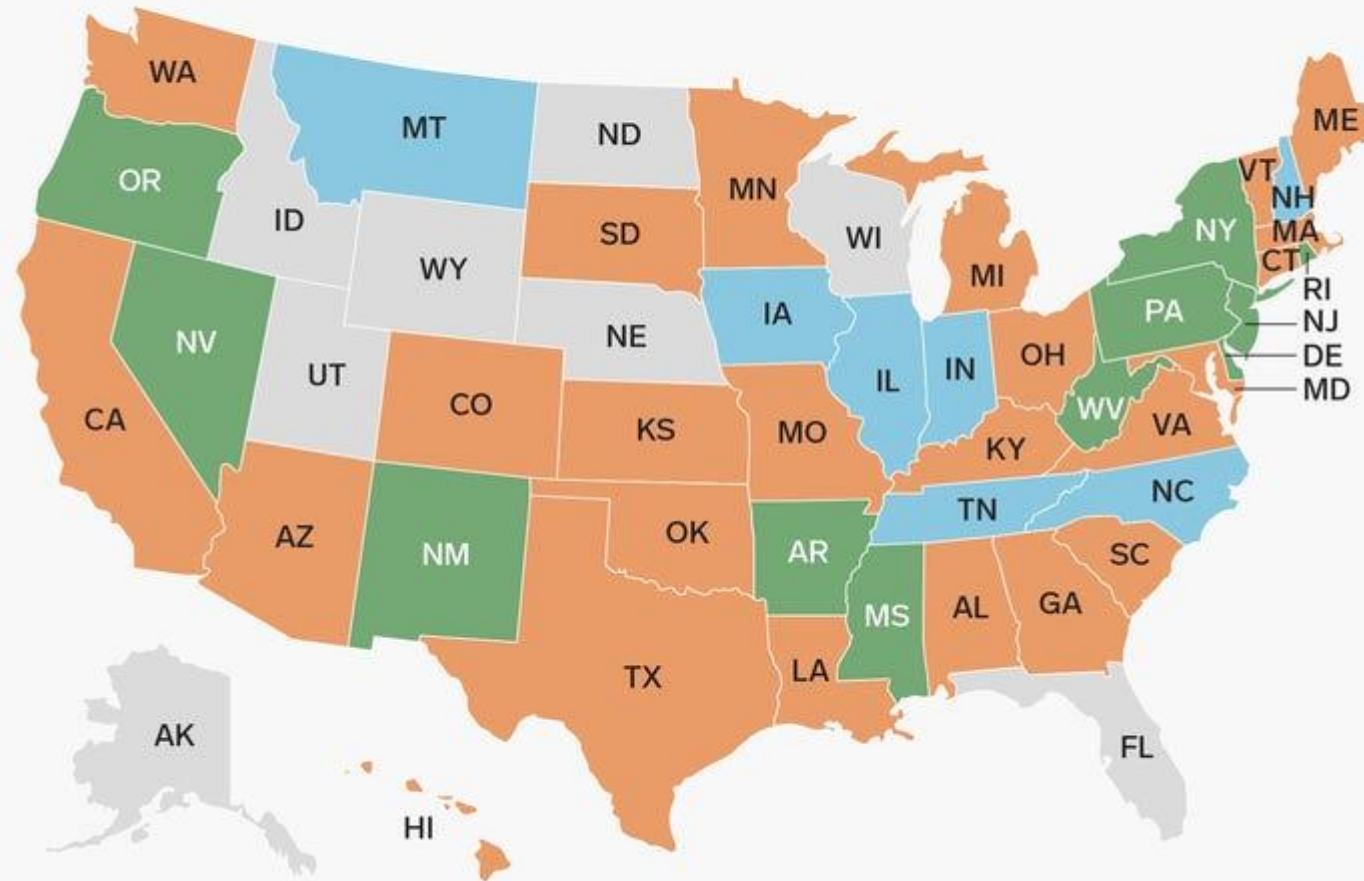
# BACKGROUND

- People previously had to either physically place bets on sports in Nevada sportsbooks, know someone that lives near one, or use one of the online sportsbooks
- The United States is moving towards legalizing sports betting
- In 2018, the US Supreme Court gave states the right to decide on legality of it within their state
- States have begun the process of legalizing



## Sports betting laws in every state

Legal Legal, pending launch Pending legislation No action



Source: Legal Sports Report

BUSINESS INSIDER



# THE GOAL

Looking specifically at NBA games, the goal is to create a model that can accurately predict the winners of games and maximize ones' chances of winning money



# THE DATA

- NBA game odds
  - From Indatabet
  - Moneyline odds from three online bookmakers
  - 10 years of games
  - 2009/2010 season – 2018/2019 season
  - 13,689 games
- NBA team ratings
  - From Basketball-Reference
  - Each team's advanced metrics for the 10 seasons





# ODDS DATA

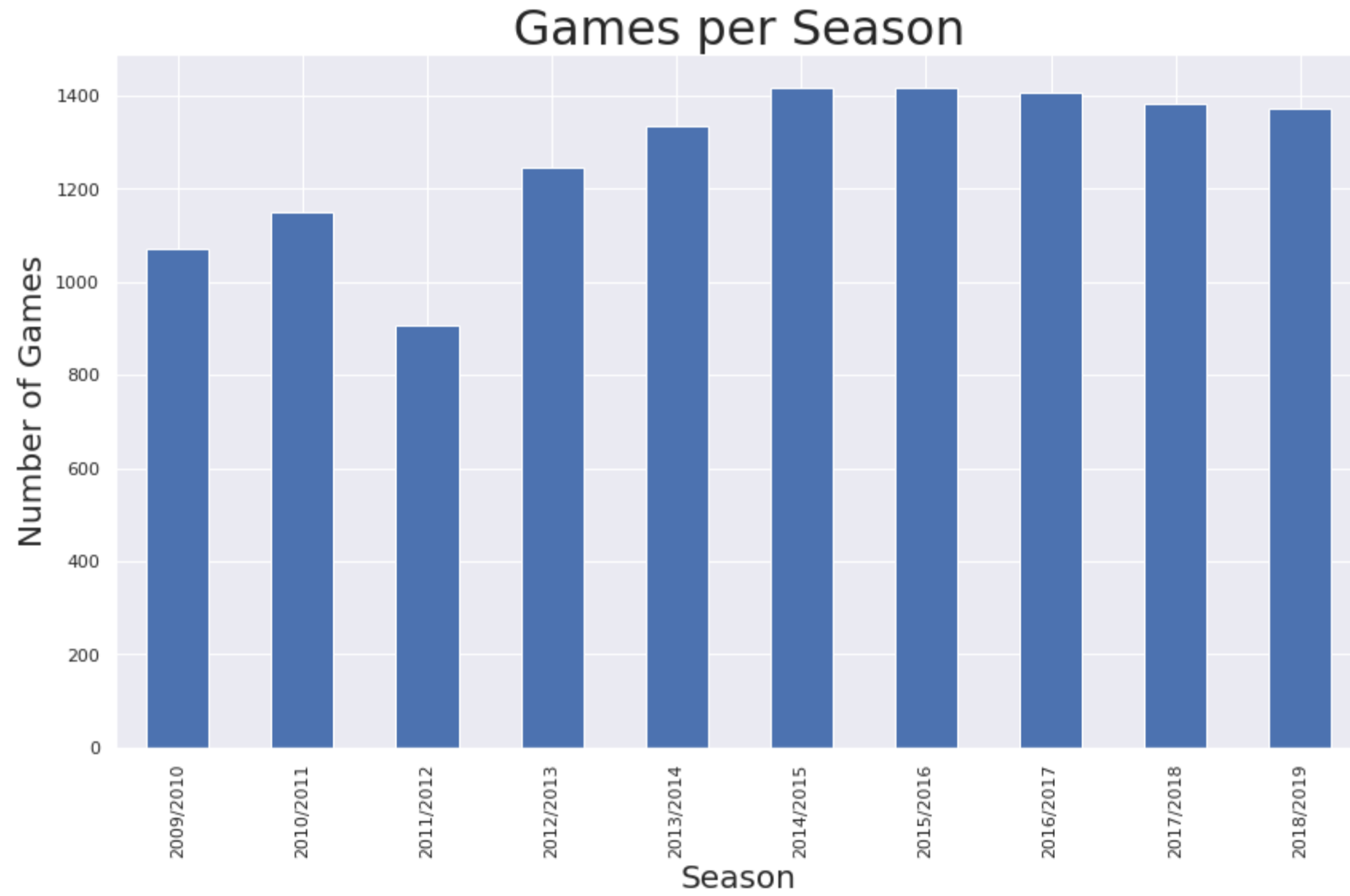
- Game information (date, time)
- Home team and away team
- Winner and final score
- Moneyline odds from three bookmakers
  - Matchbook, Pinnacle, Bet365
  - Betting on the moneyline means betting on the winner of the game



# NBA TEAM DATA

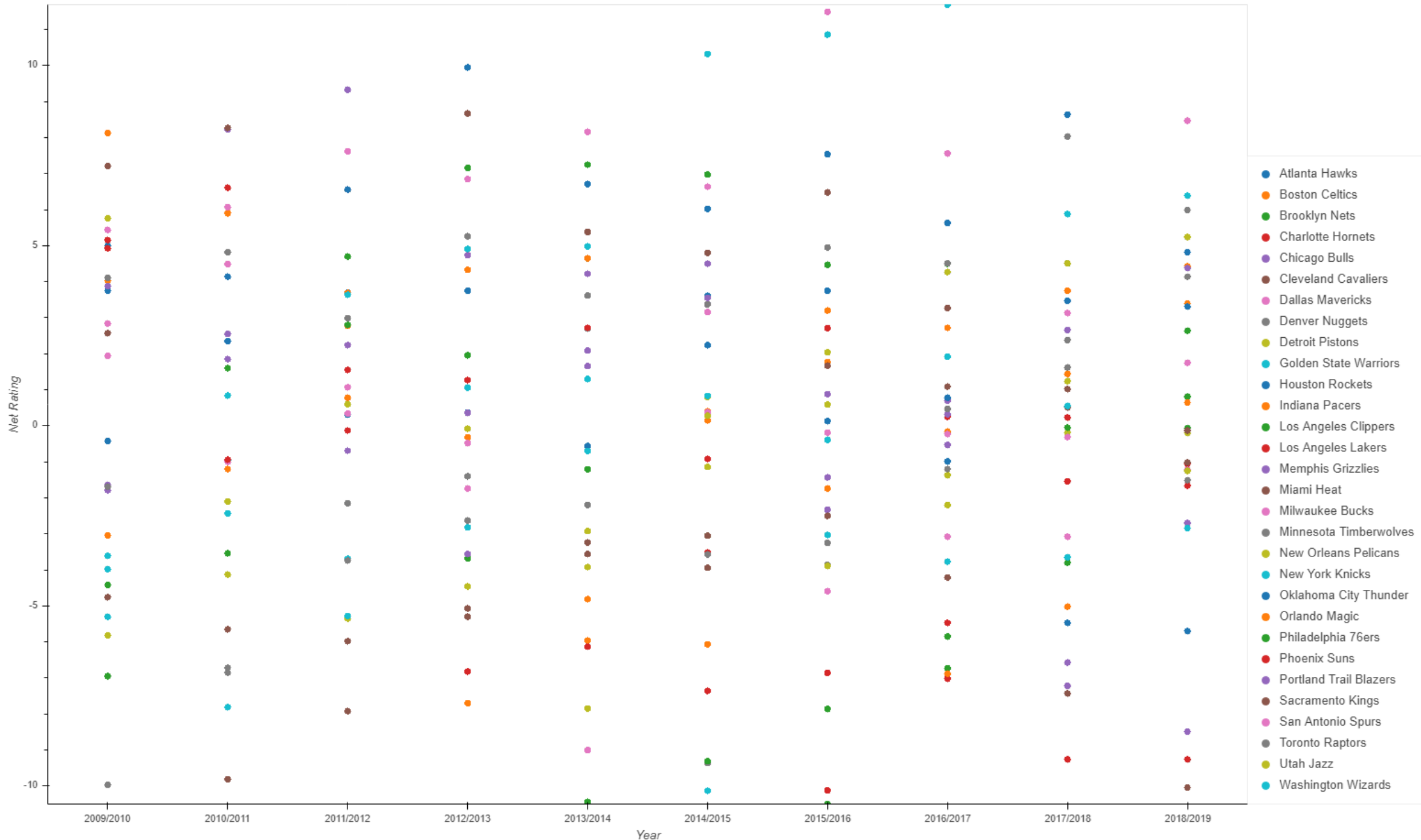
- Margin of victory (MOV)
- Offensive rating (ORtg)
- Defensive rating (DRtg)
- Net rating (NRtg)
- Adjusted ratings







Yearly Team Net Rating



# MODELS USED

- Logistic Regression
- Decision Tree
- Random Forests
- KNN
- Boosted Trees
- Neural Network



# FEATURE ENGINEERING

- Average odds
- Net rating differential
- Margin of victory differential



# MODEL EVALUATION

- Accuracy score
- Confusion matrix
- Cross validation scores



# ACCURACY SCORES

Logistic  
Regression  
67.2%

Decision Tree  
58.2%

Random Forest  
62.8%

KNN  
64.9%

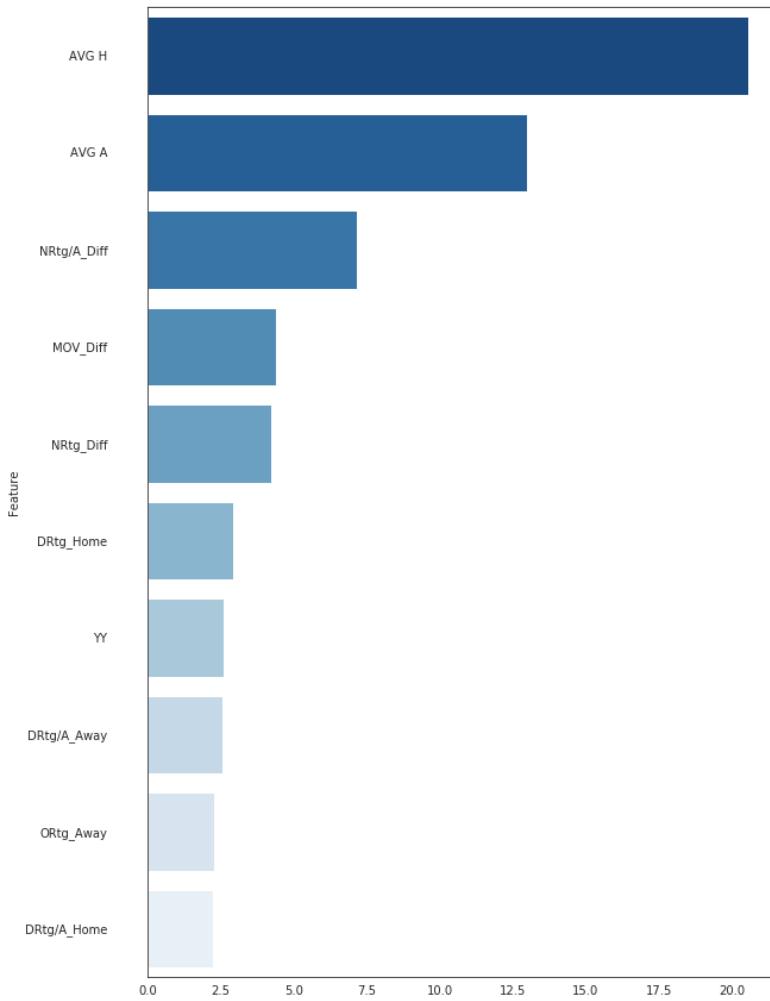
**Boosted Trees**  
**67.4%**

Neural Network  
59.8%

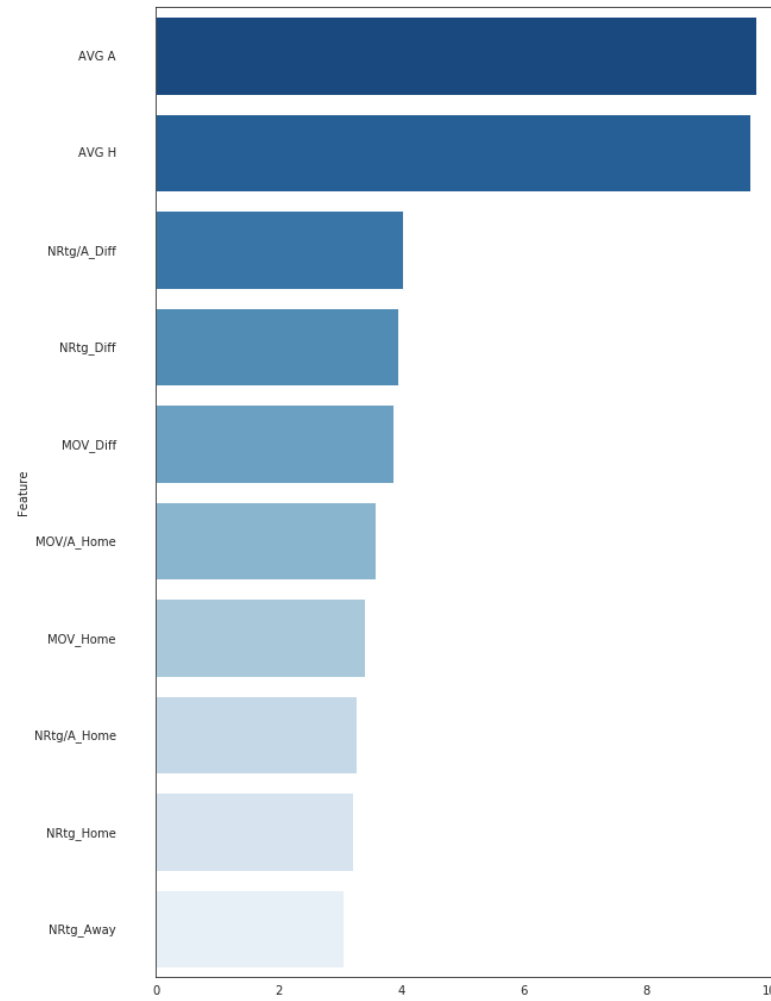


# Feature Importance by Model

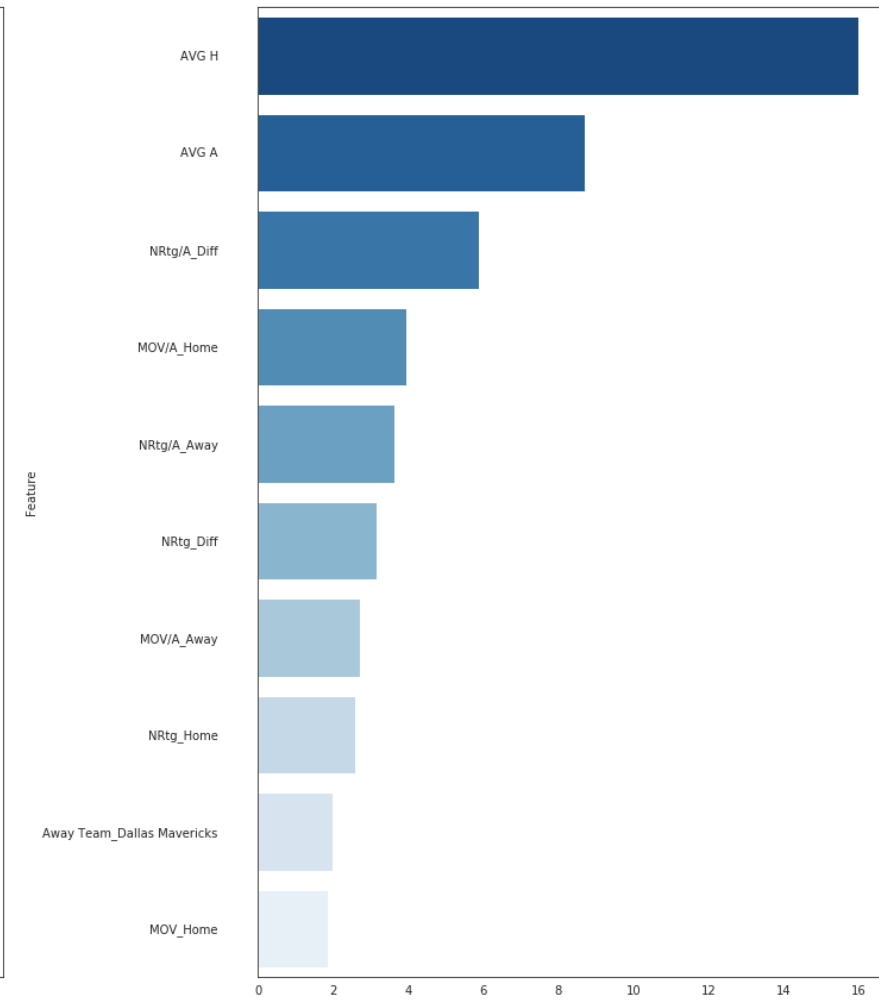
Decision Tree



Random Forest



Boosted Trees



Percent Importance



# CONCLUSION

- Able to predict the winner of NBA games with roughly 65-70% accuracy
- The accuracy scores across all models were similar
- Most important features were where the game was being played, and the differential in net ratings between the teams playing
- Improvements can be made

