



# PREDICTING NFL PLAY CALLS

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# Business Case

- NFL Defensive coordinators currently make play call predictions based on probability charts of how often a specific team runs/passes in specific situations
- With the advent of the hurry-up offense, coaches have typically less than 25 seconds to decide on which play to run
- There is simply not enough time to consider each individual factor
- A Machine Learning Model would allow the coach to quickly make a decision on the aggregate of all the factors at once

# Business Value

- **Game Prep** - Using the model would uncover team-specific tendencies of the upcoming opponent, which a human watching film could not pick up on their own. This would allow a defensive coach to create a game plan that better incorporates the behavior of that specific opponent.
- **In-Game** - A model could easily be trained on the opponent's data before a game, and then a prediction could be made in a matter of seconds between plays.
- Better preparation/knowledge = More wins
- More wins/Super Bowl = more revenue (ticket sales, concessions, merchandise, etc.)

# Goals



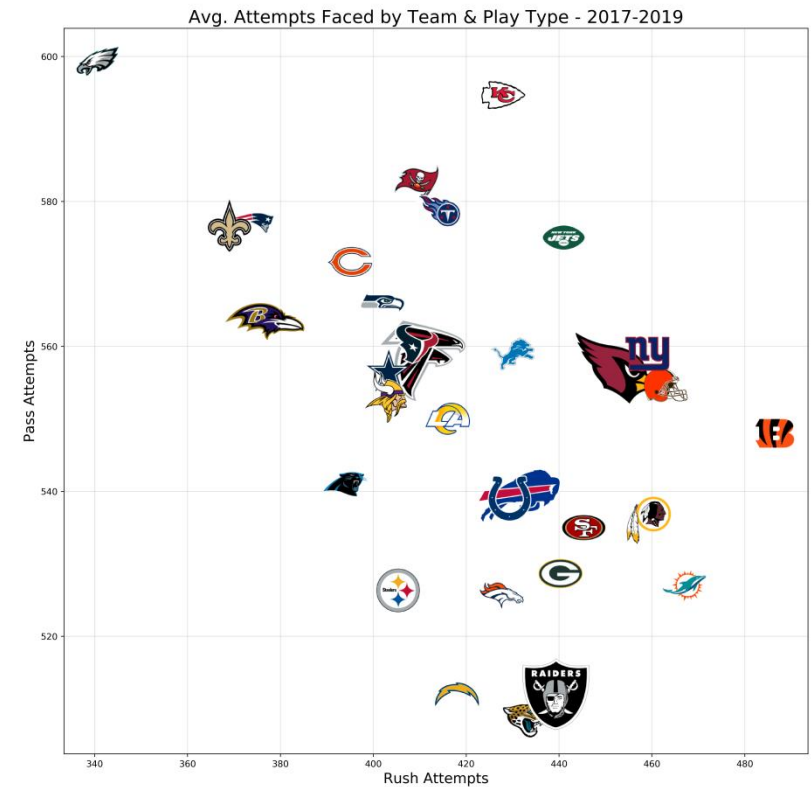
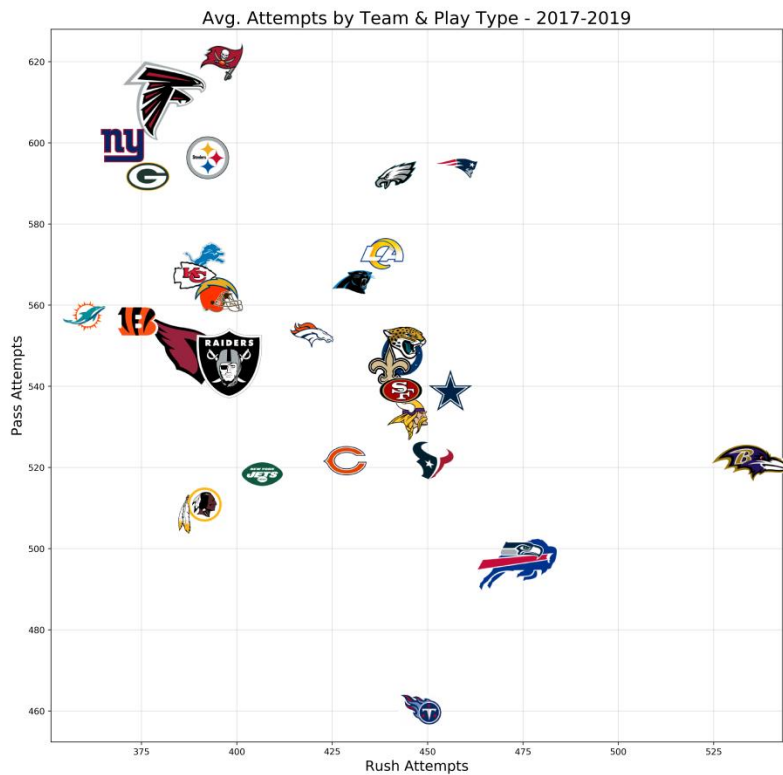
- Identify the most predictive features for NFL play calling
- Create a model that accurately predicts whether a team will run or pass the ball on the next play

# DataSet

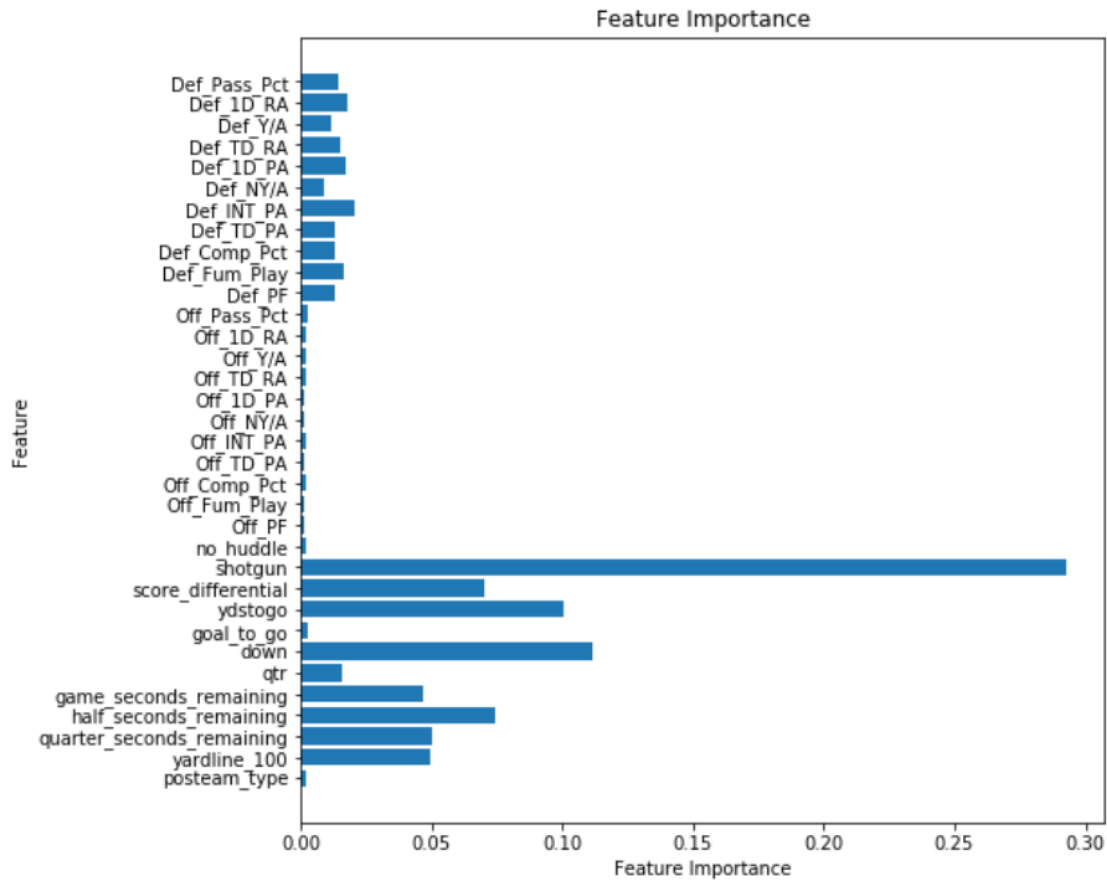
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- This dataset was acquired through two sources:
- <https://github.com/guga31bb/nflfastR-data>
- <https://www.pro-football-reference.com/>

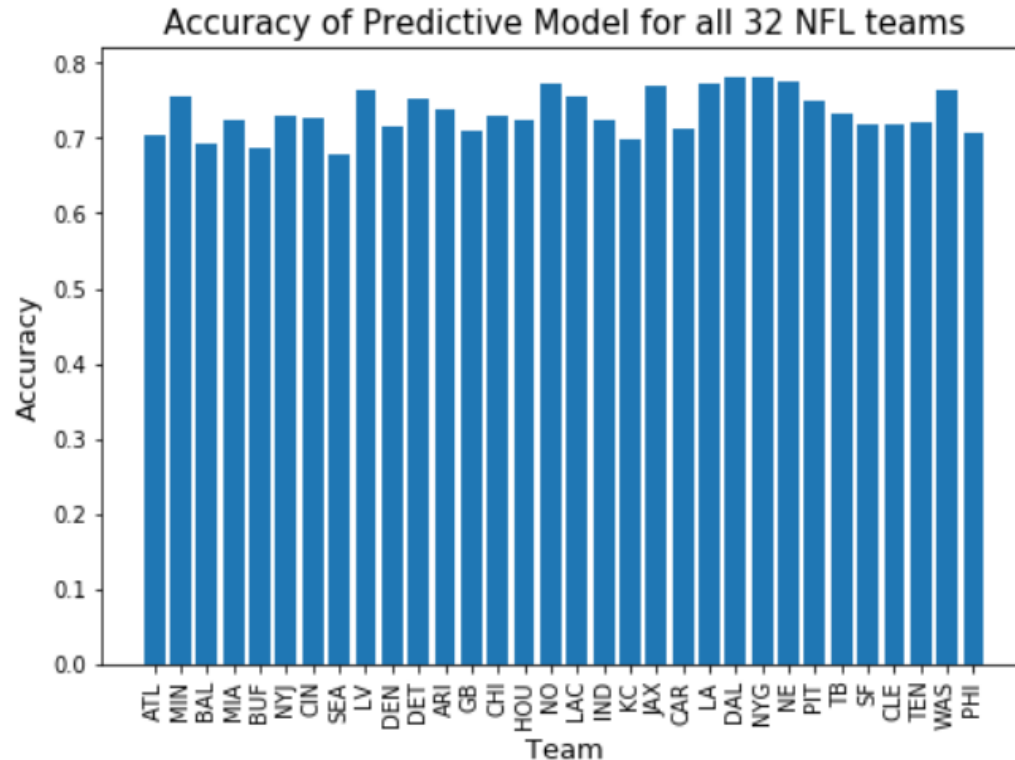
# Team Play Distribution



# Predictive Features



# Model Use



- ❑ Model, which was trained on Philadelphia Eagles data, was able to predict the play type 71.35% accurately
- ❑ Using this model on every team, was able to predict a high of 78.2% for the New York Giants



# Recommendations

- Focus on the which formation the team is lining up in, as shotgun was the most predictive feature
- Hire an analytics person that can quickly run the model between plays and relay that data to the coaching staff
- Use model in developing game plans to uncover hidden tendencies specific to each opponent

# Future Work

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- ❑ Try out more models to improve accuracy
- ❑ Look for more data points that may be useful in predicting play call
- ❑ Create program that allows you to input situational data on the fly to allow for real-time predictions during a NFL game
- ❑ Obtain formation information
- ❑ Obtain personnel information

# Thank You



☐ Questions?