Success + Improvement in F1 Races

GR 5069 - Final Group Project

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Research Questions

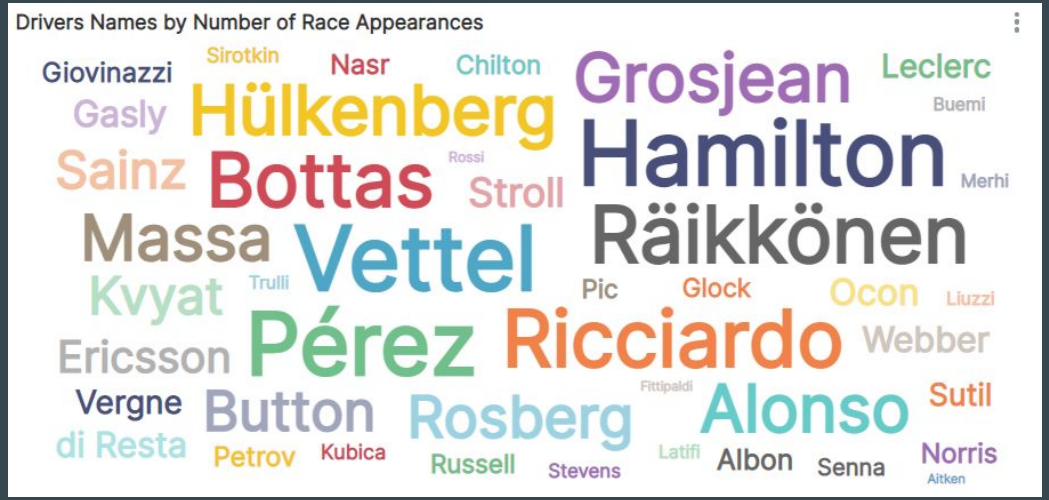
What are determinants and predictors of success and improvement in F1 races?

a) Why do F1 drivers come in second place in races?
b) What determines constructors' success?
c) What are explanations of driver improvement in performance?

- Prediction vs. Explanation
- What factors are important?
  - Constructors
  - Drivers' previous finishes
  - Circuits
  - Driver attributes

Data

- F1 races from 1950 - 2017
- Includes info on drivers, constructors, races, race standings
- 12k+ constructor standing observations, 32k+ driver standing observatios



Methodology

Models

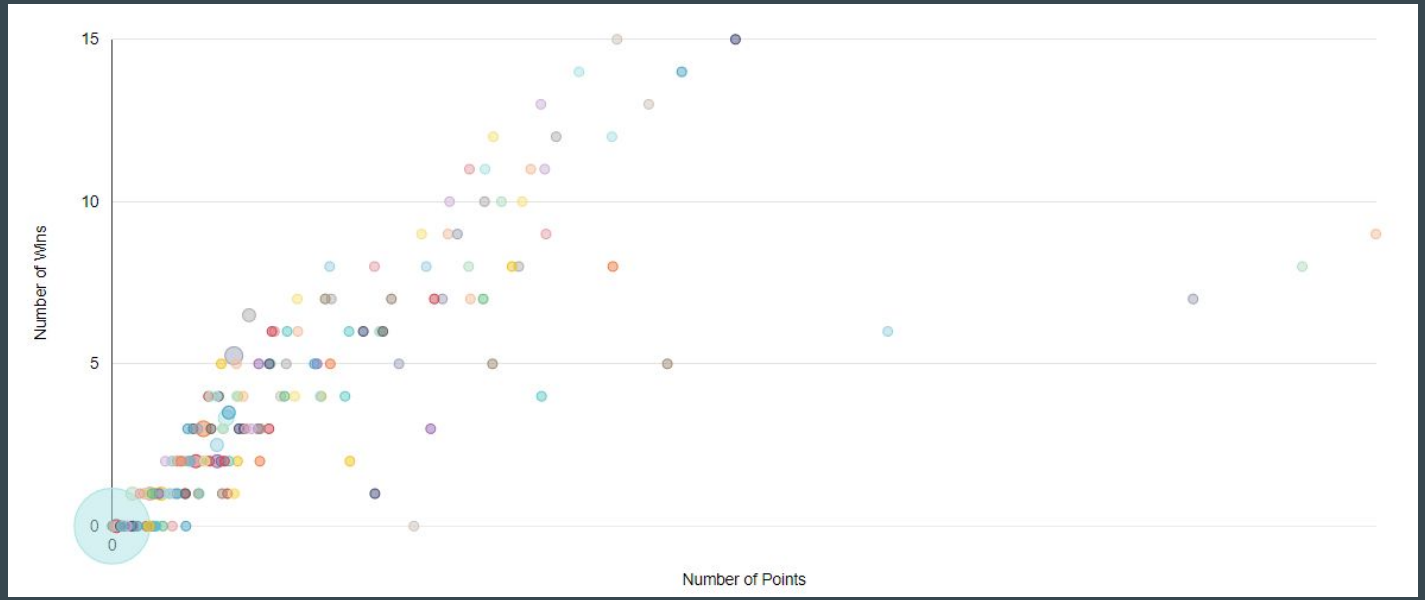
- Measuring Constructor Success: **Linear Model vs. Random Forest**
  - Number of wins as the dependent variable
  - Position, points, and nationality used as independent variables

- Predicting second place finishes: **Decision Trees**
  - More than two possible nominal outcome variables (drivers)

- Explaining improvement in driver performance: **Random Forest and Linear Regression Model**
  - Improvement in position from time *t-1* to *t* as dependent variable
  - Use age, previous wins, points, previous position as features

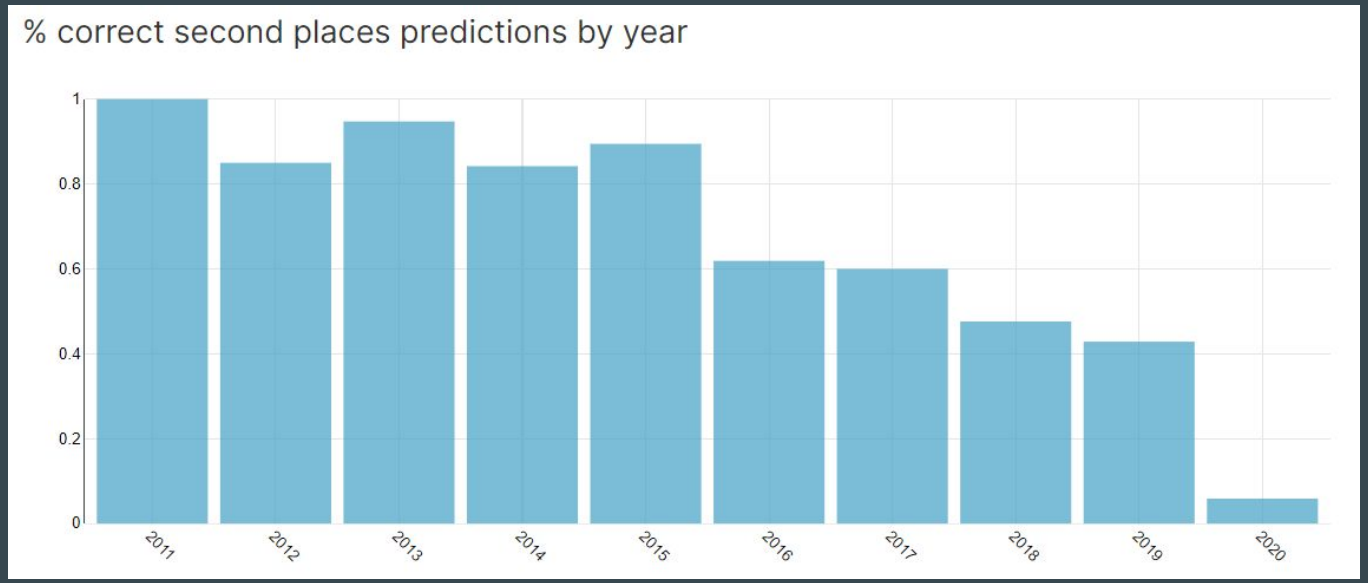
Strongest Predictor of Constructor Success: Points!

- Every predictor is statistically significant, with the exception of various nationalities
- Points is the strongest predictor
- Linear model shows to be much more accurate than random forest



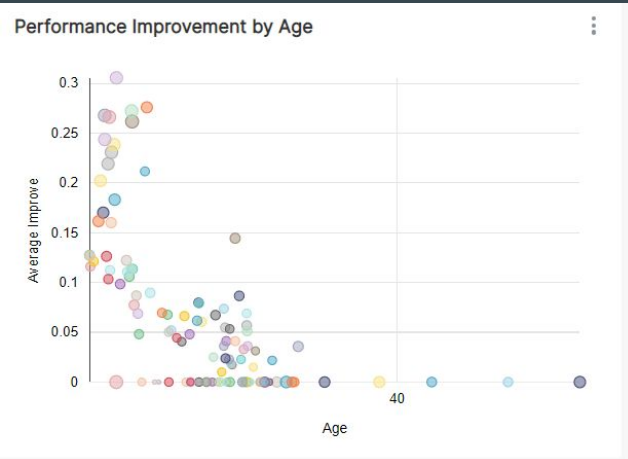
65% Accuracy Predicting Second place

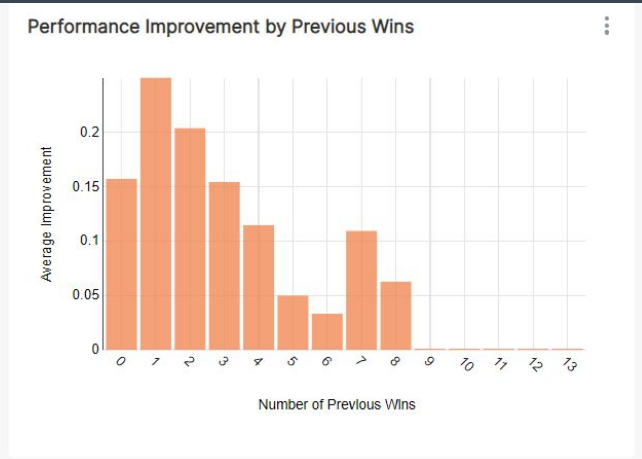
- Use decision trees model
- ~65% accuracy overall
- Accuracy varies in test set period (2011 - 2020)

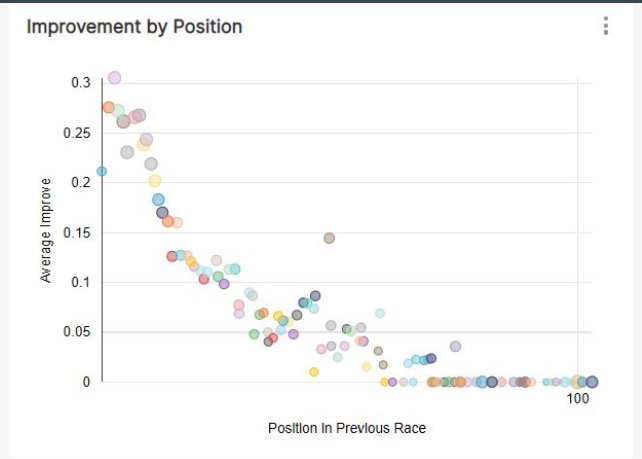


Age, wins, points predicts driver improvement

- Age (-0.001***), wins (0.008***), and points (0.0002*)
- Predicts about 14% of variance in improvement







Thanks!