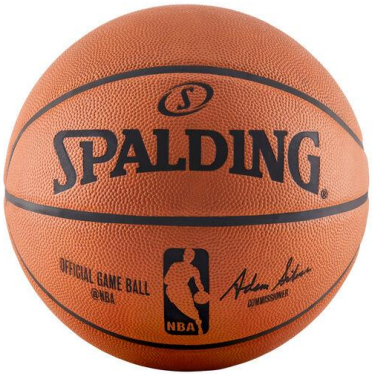
Predicting Winners and Losers for NBA games at Halftime

J. Garrecht Metzger

(Metis Winter Cohort 2021)



Overview

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1. Background

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2. Dataset

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3. Model

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4. Summary & Future Work

Inspiration for study?

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- Use Case: Betting
  - Maybe make some avocado money off your friends?

Structure

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  - Balanced targets
    - (i.e., count(win) = count(loss)

Data

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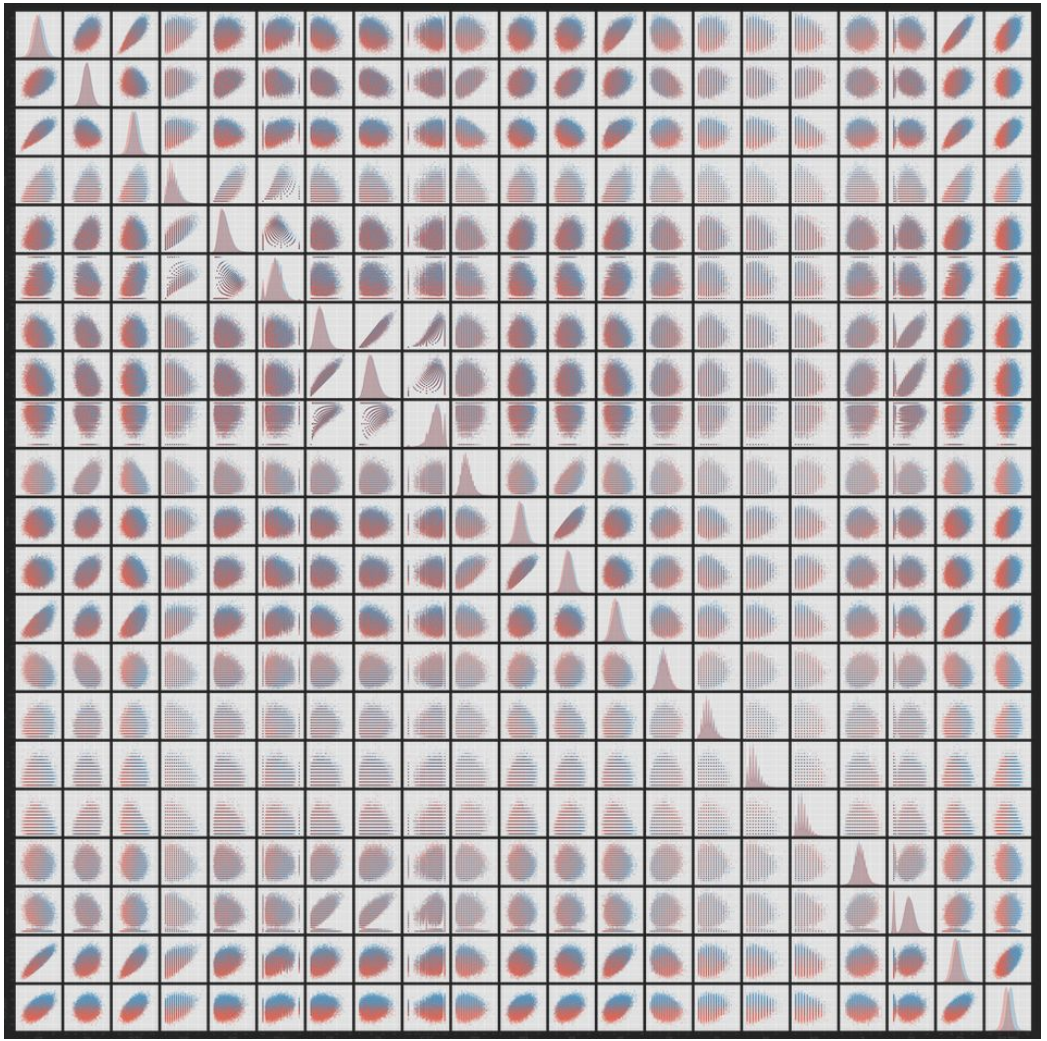
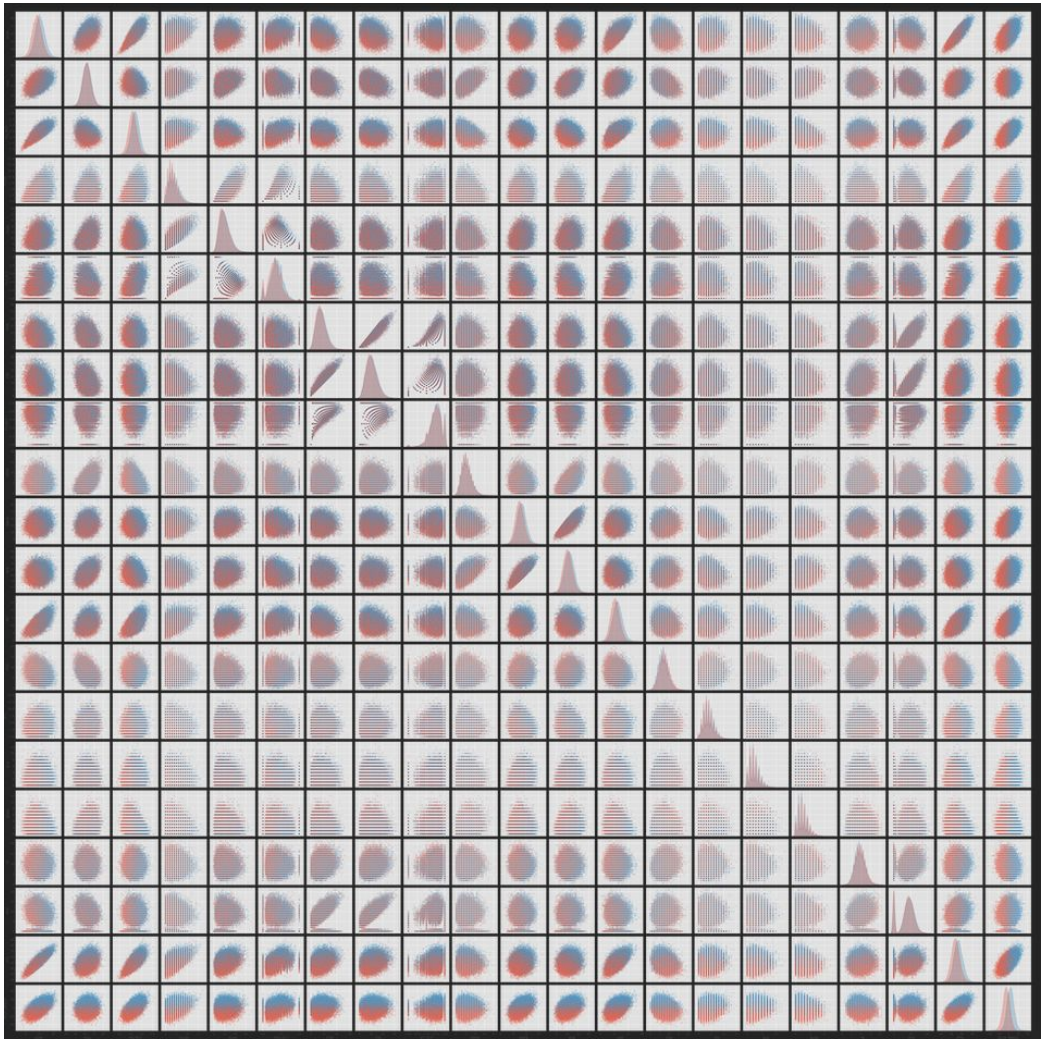


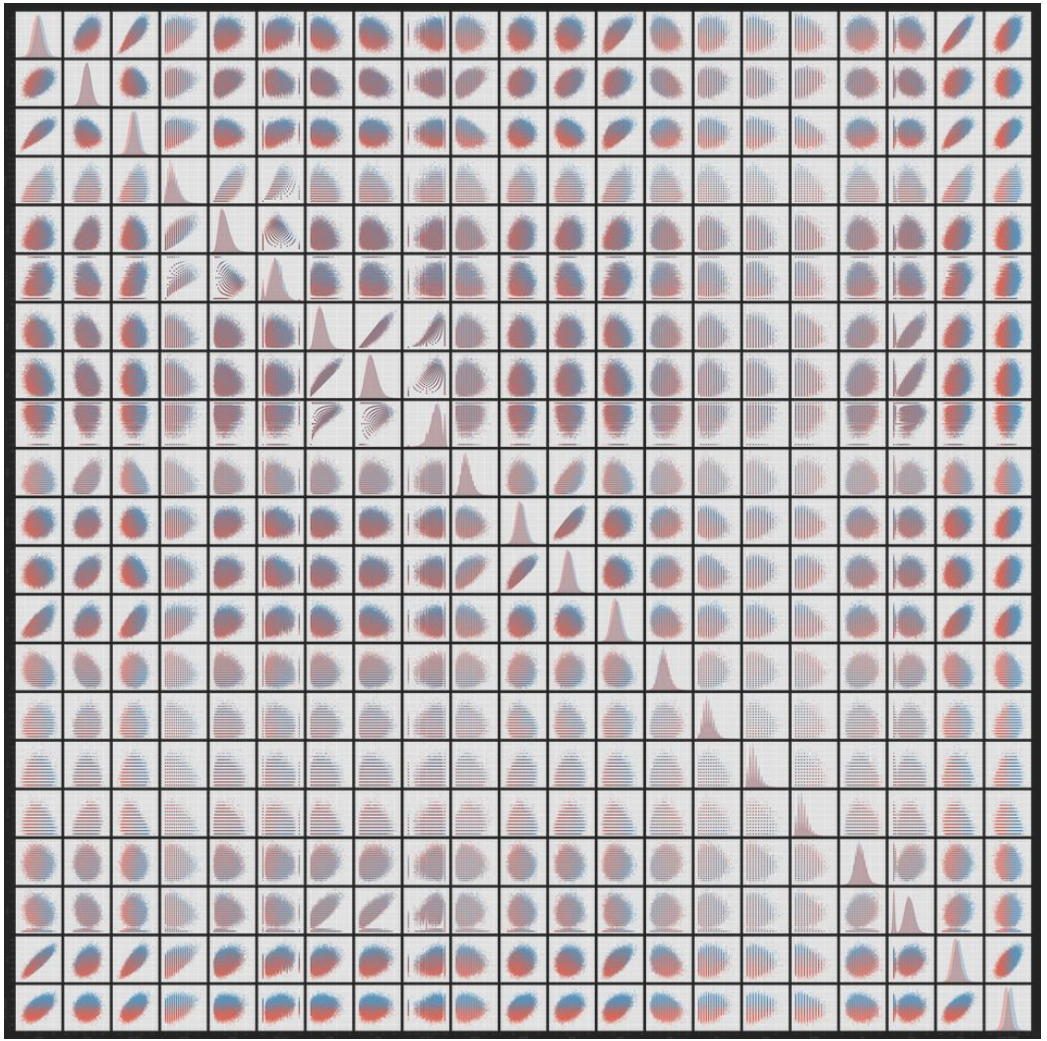
Data

- **20** Years



Data

- **20** Years
- **20** Seasons



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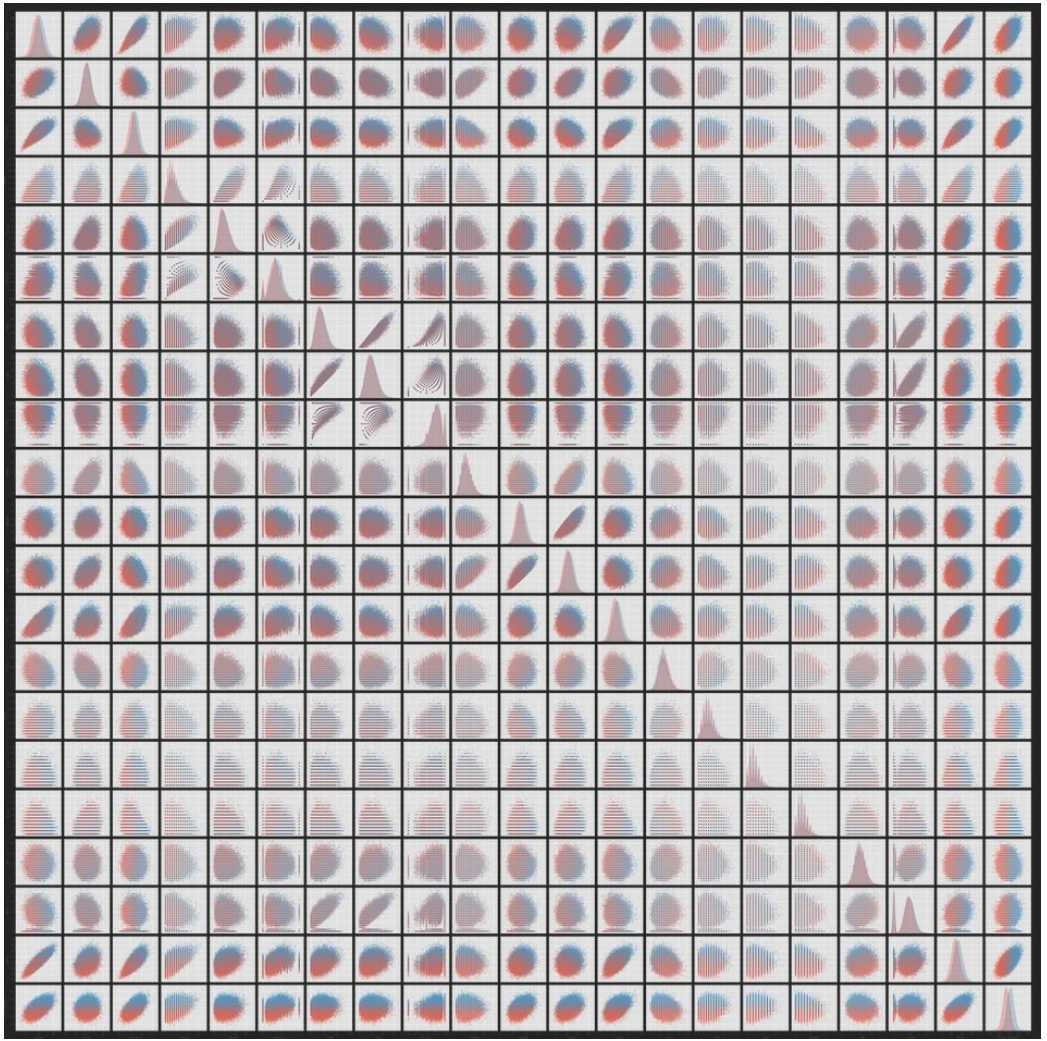
- **20** Years
- **20** Seasons
- **30** Teams



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- **20** Years
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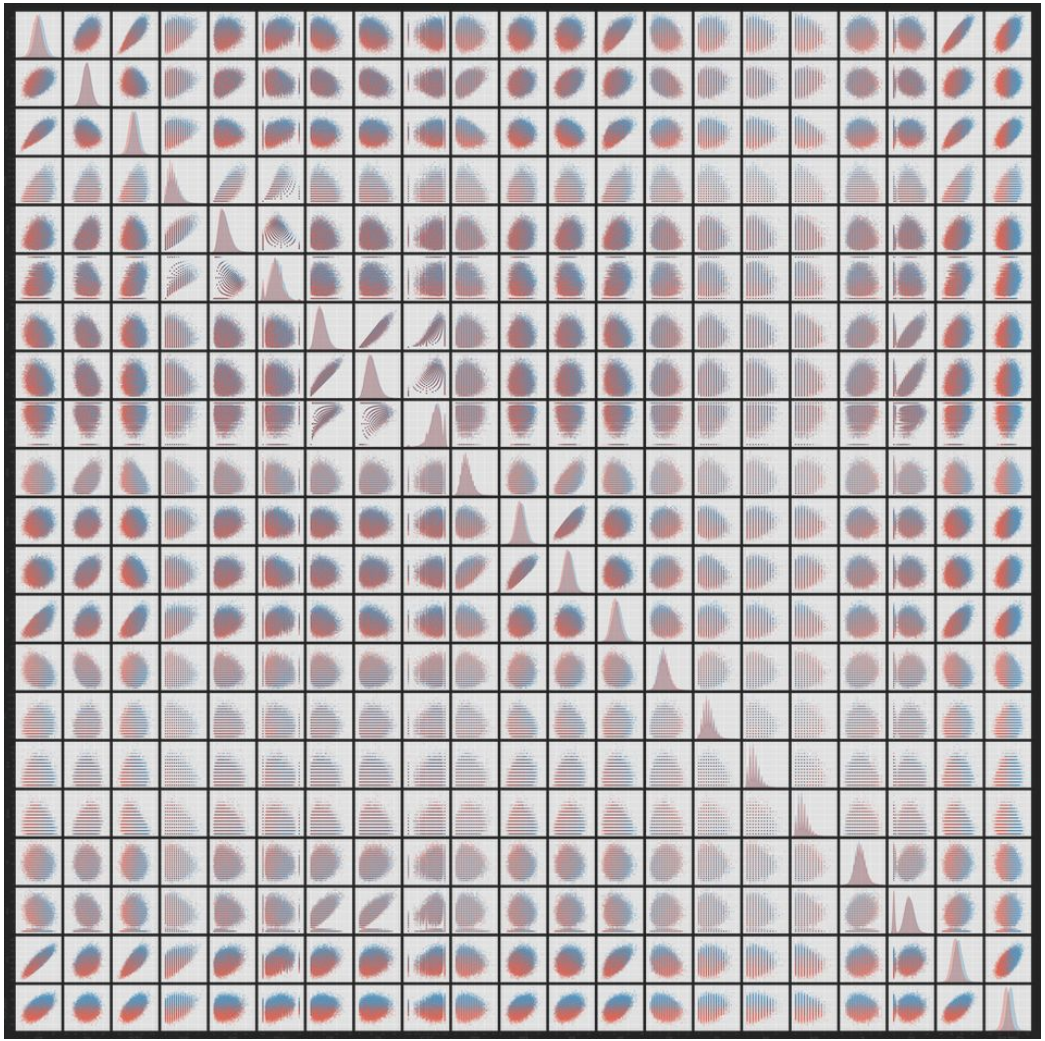
- **23,144** Games



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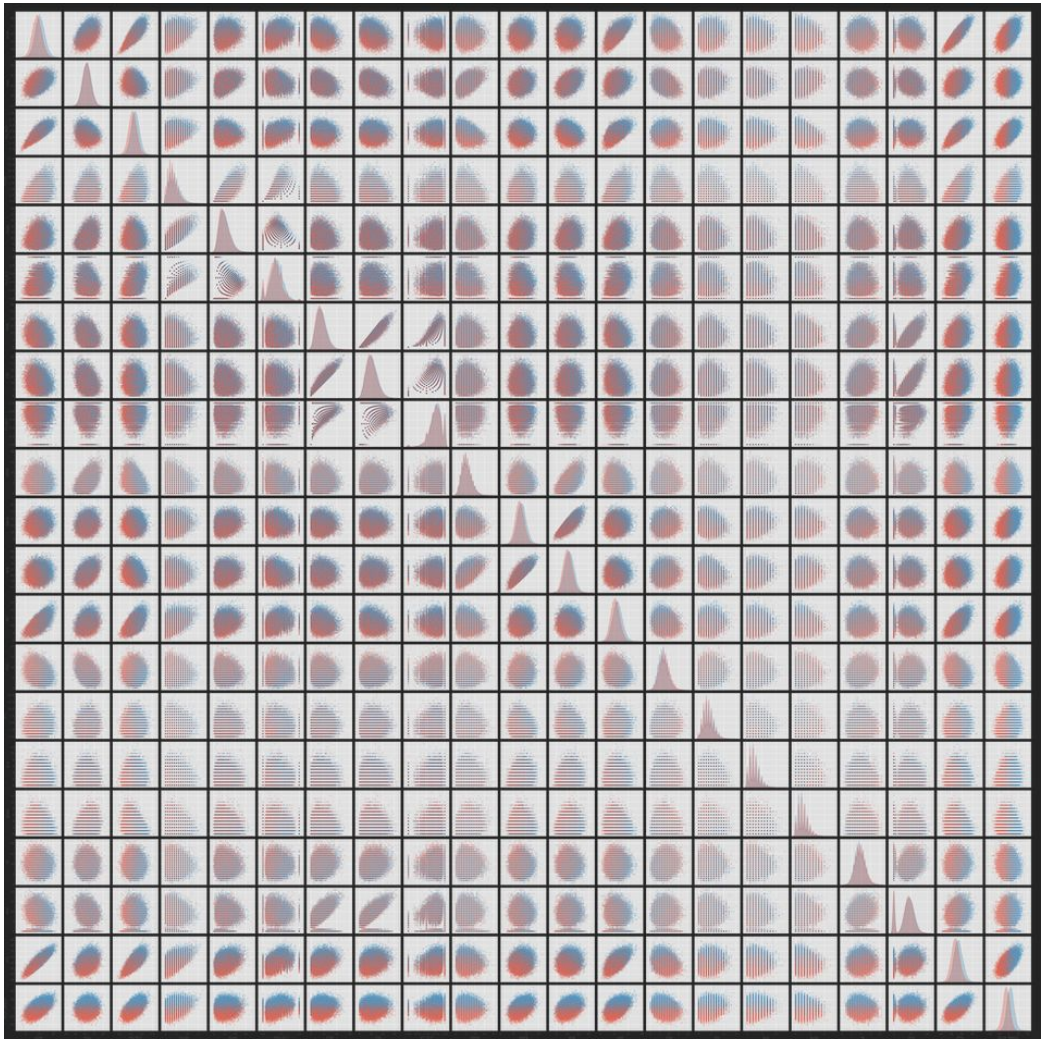
- **46,288** Rows



Data

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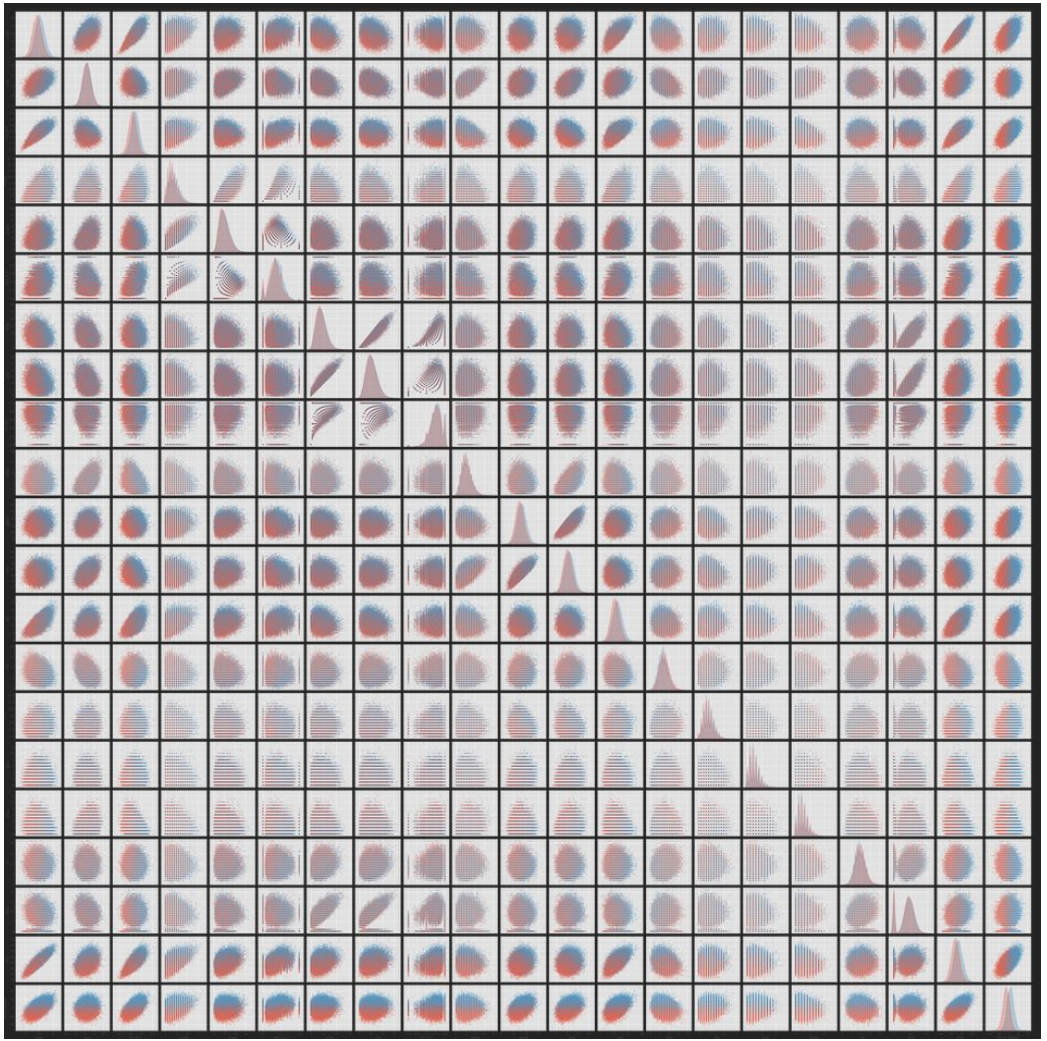
- **21** Features



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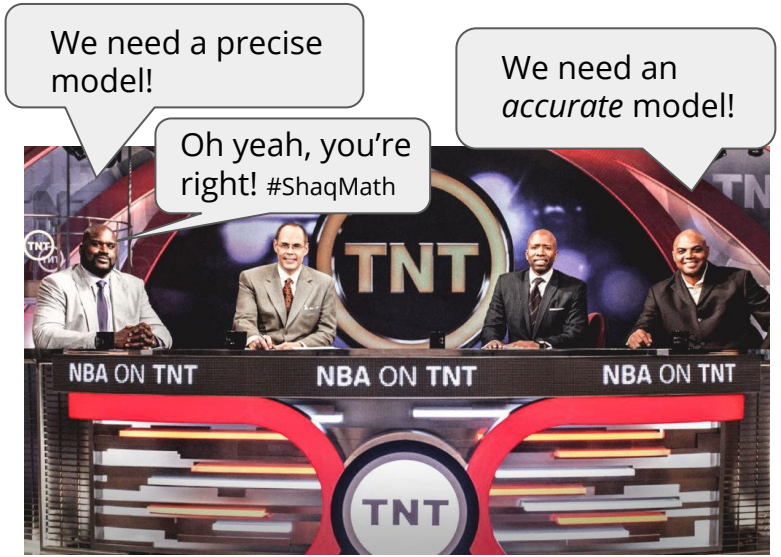

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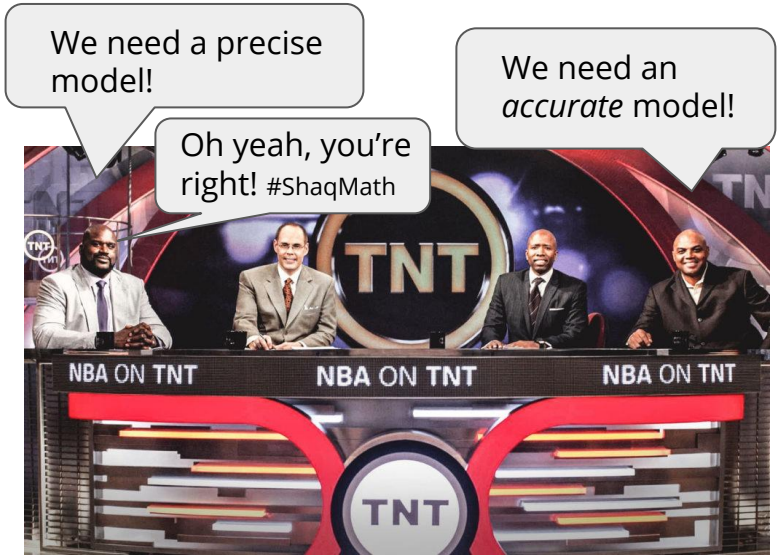

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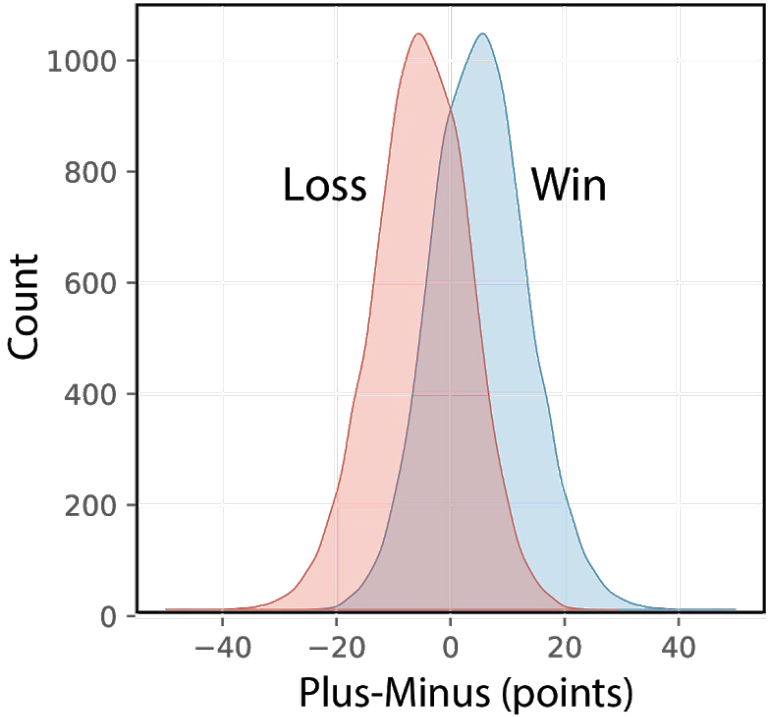

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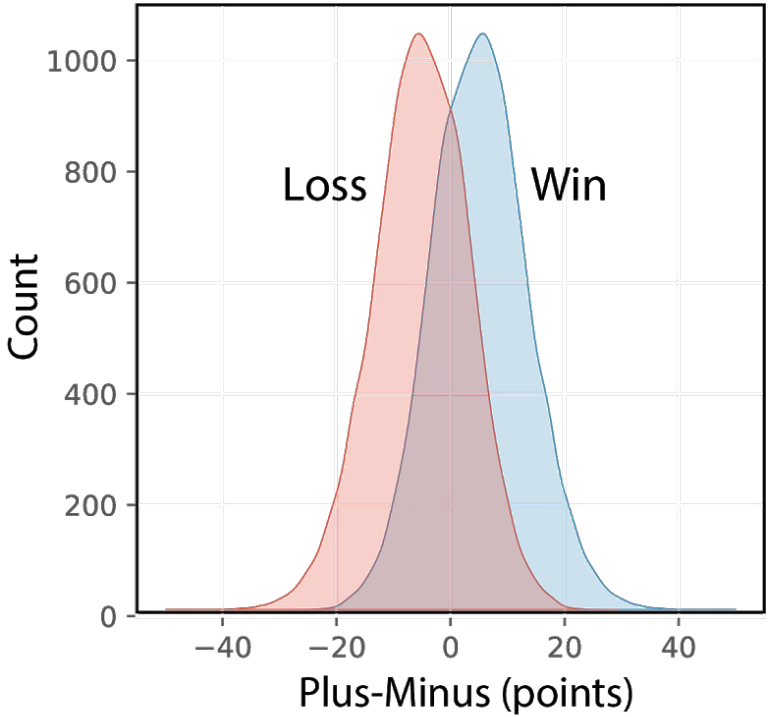

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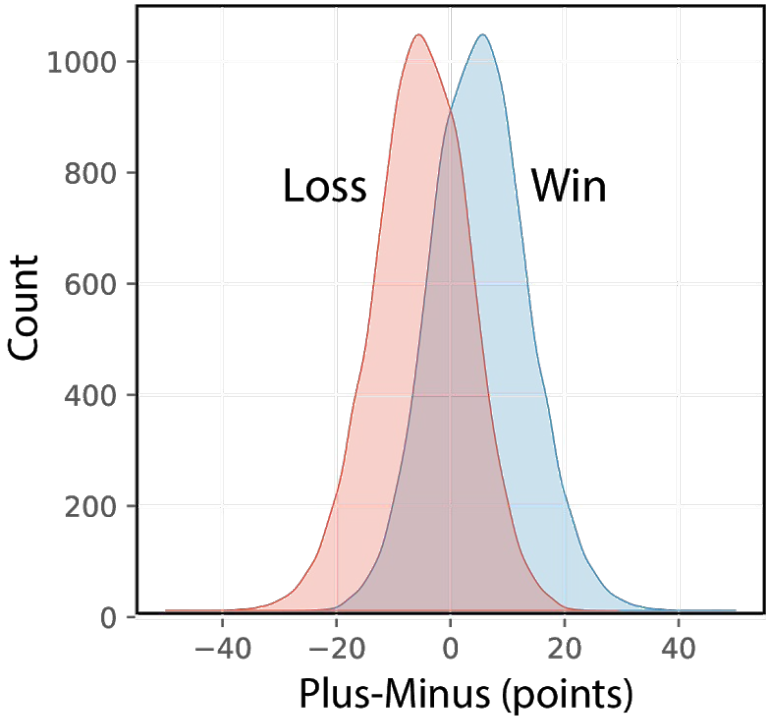
    - Accuracy: 0.72



Logistic Model Evaluation

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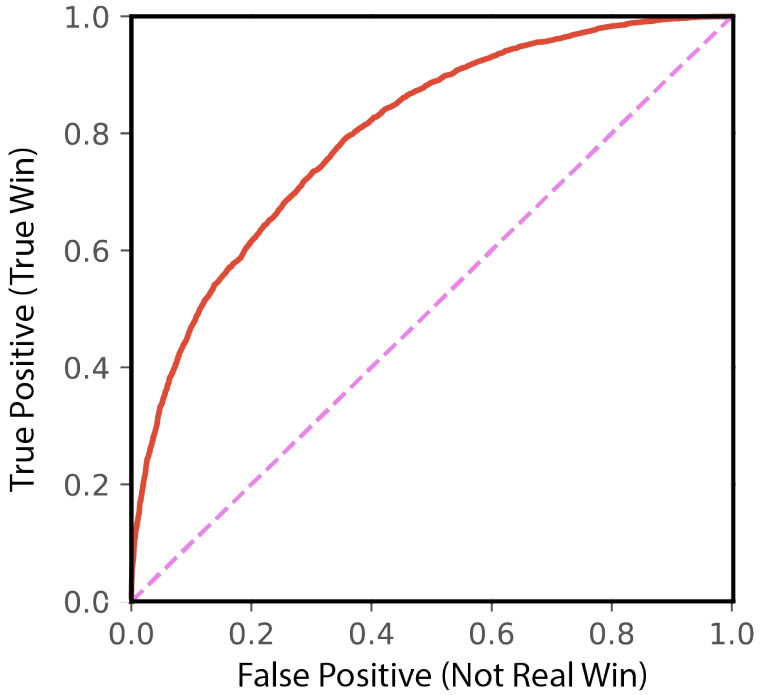

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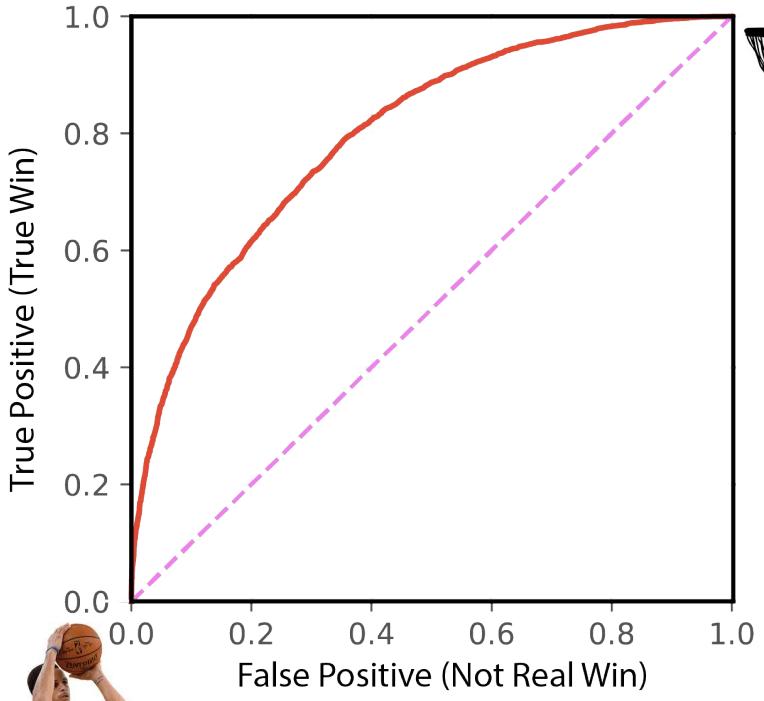

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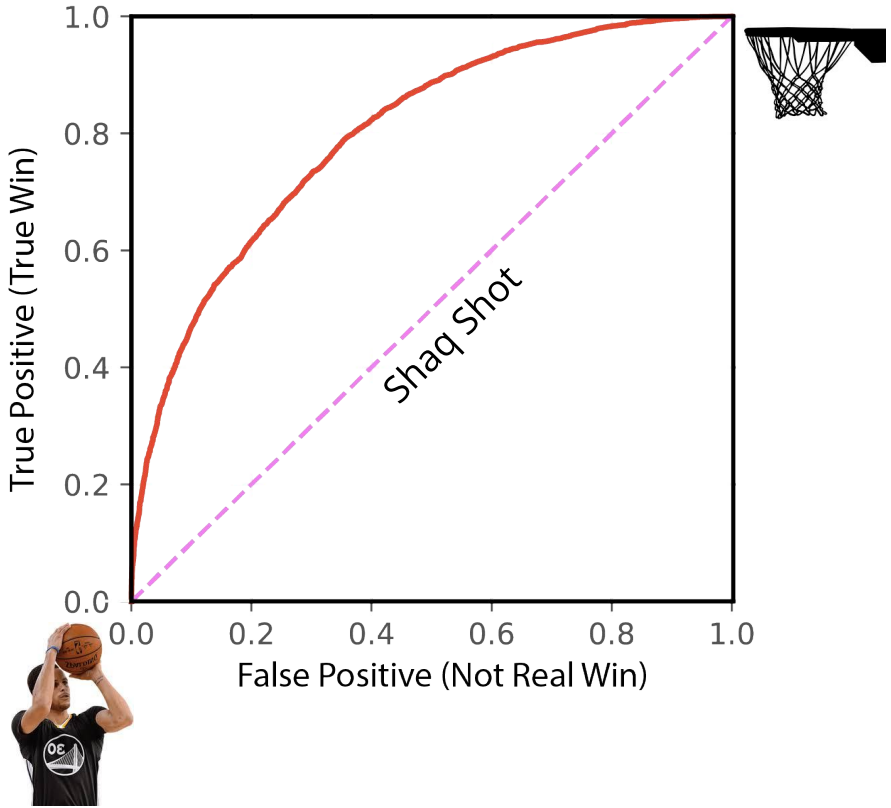

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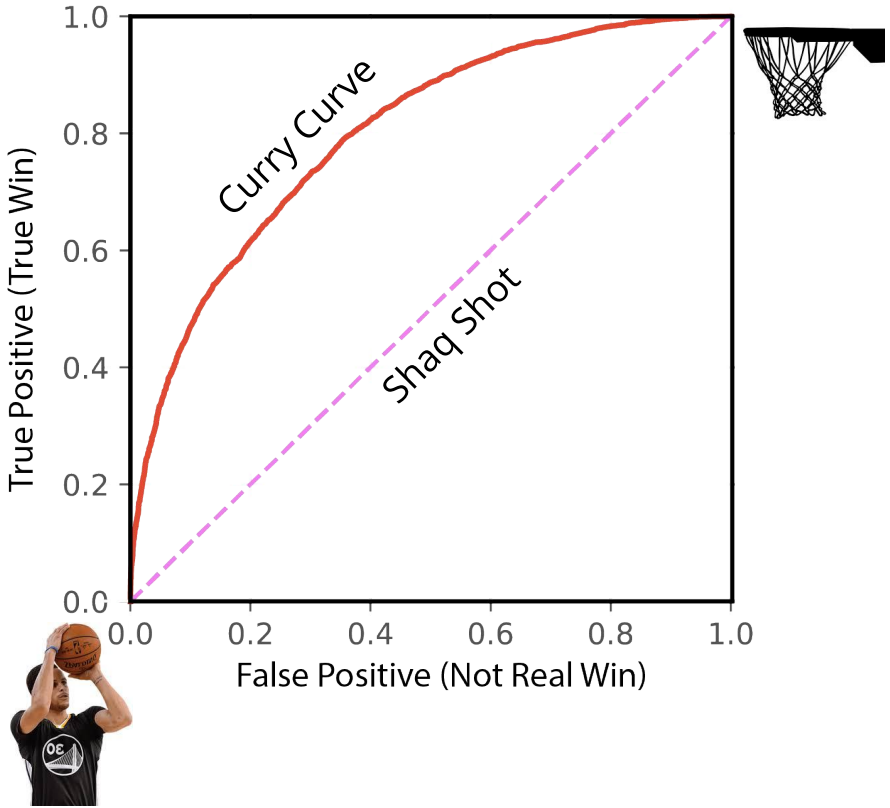

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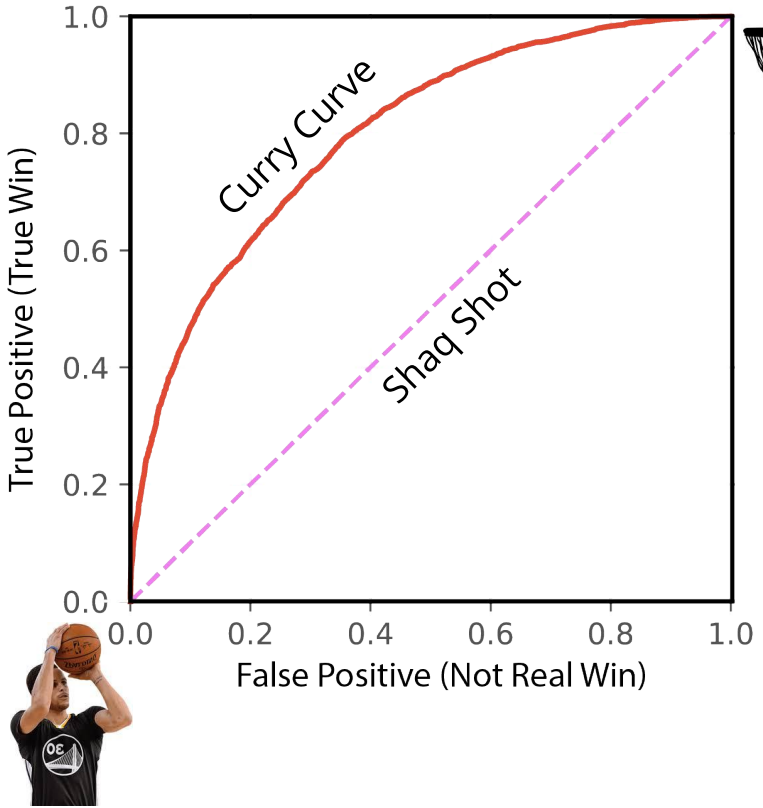
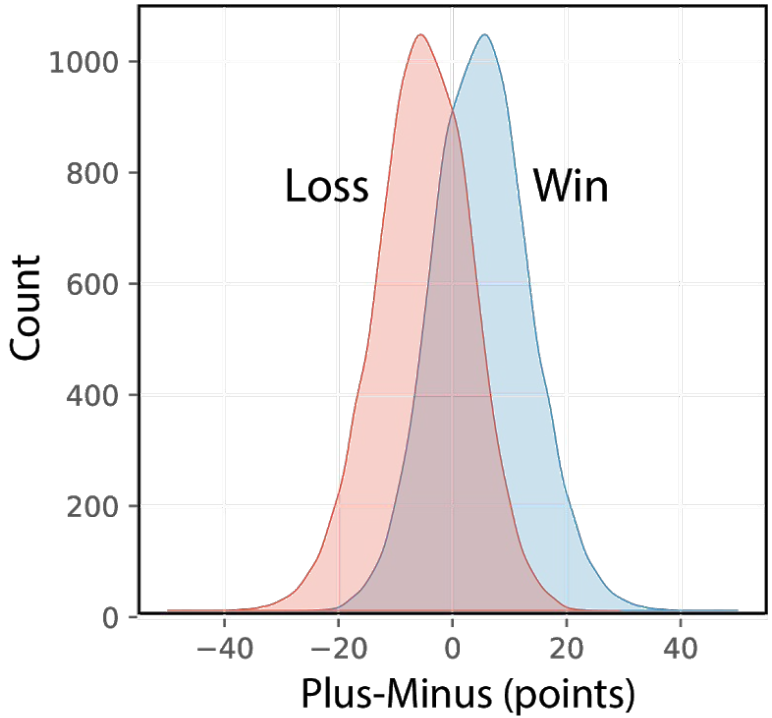


- *ROAUC* Score
  - **0.8**

Point Difference is the principal feature



What did we learn?

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- The first half matters, a lot!

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What do we want to learn next?

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  - More relative features (e.g., PLUS_MINUS, but rebounds).

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- The first half matters, a lot!
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What do we want to learn next?

- Feature Engineering
  - Create new time-dependent features
  - More relative features (e.g., PLUS_MINUS, but rebounds).
- More sophisticated analyses

FIN

Sources

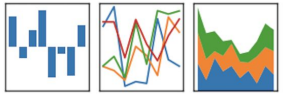
1. Jonathan Ferrey/Getty Images
2. https://pypi.org/project/nba-api/
3. https://github.com/seemethere/nba_py
4. https://github.com/swar/nba_api

Tools Used

NumPy

pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



Maybe data goes over too many years or seasons?

“The Game Has Changed”

-*Daft Punk*, Tron: Legacy

Maybe 1 season is all you should consider? Or you could have some factor for what players are still there/composition of the team?

3 pointer has doubled in popularity