Predicting Regular Season NBA Games Scores
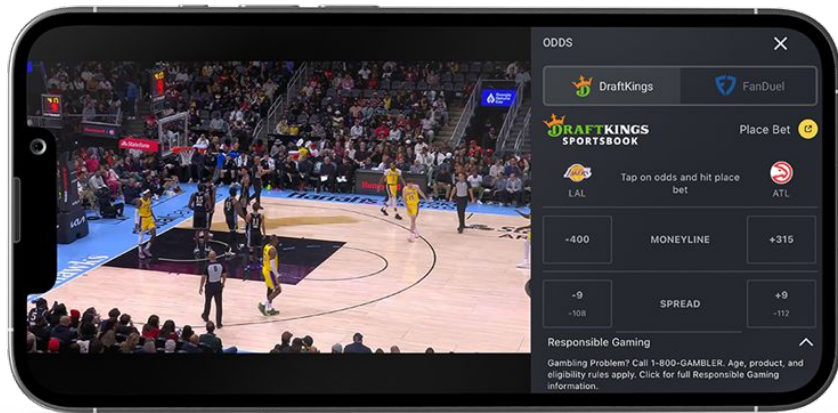
Initial Stage

May 31, 2024

Eric Zhou

Opportunity

- Data-driven recommendations for NBA teams internally
- Fan engagement and entertainment
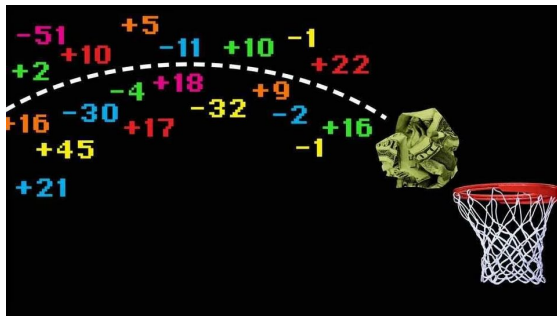- Betting and wagering

Proposed Vision

	Home Team		Minnesota Timberwolves		10.85%	111
	Away Team		Golden State Warriors		89.15%	136

Minnesota Timberwolves

	Player	MP	xMP	FGA + FTA	xFGA + FTA	2PA Poss.	2P%	3PA Poss.	3P%	FT Poss.	FT%	Rank	Pts. Sim
PG	D'Angelo Russell	32.7	32.7	16.5	16.6	40.85%	55.90%	39.02%	35.20%	20.12%	85.60%	3	13
SG	Anthony Edwards	36.5	36.5	24.2	24.3	47.52%	51.50%	29.34%	36.10%	23.14%	75.00%	1	41
PF	Karl-Anthony Towns	33.8	33.8	19.4	19.5	45.64%	61.80%	28.72%	32.50%	25.64%	88.50%	2	22
C	Rudy Gobert	31.6	31.6	12.8	12.9	61.72%	68.20%	0.78%	0.00%	37.50%	67.10%	4	14
SF	Taurean Prince	20.2	12.5	7.3	3.7	38.36%	64.40%	45.21%	39.10%	16.44%	76.90%	7	7
#1	Jaden McDaniels	30.6	30.6	10.3	10.4	53.85%	61.10%	29.81%	37.90%	16.35%	74.20%	5	21
#2	Austin Rivers	20.3	12.6	4.9	2.5	32.65%	56.00%	48.98%	37.80%	18.37%	86.20%	6	0
#3	Taurean Prince	20.2	12.5	7.3	3.7	38.36%	64.40%	45.21%	39.10%	16.44%	76.90%	8	5
#4	Naz Reid	17.6	10.9	9.2	5.0	52.17%	65.60%	29.35%	37.50%	18.48%	63.60%	9	13
#5	Jordan McLaughlin	15.9	9.8	4.2	2.5	42.86%	62.50%	45.24%	23.50%	11.90%	100.00%	10	2
#6	Bryn Forbes	10.6	6.6	3.9	2.9	41.03%	42.40%	43.59%	25.00%	15.38%	100.00%	11	2
#7	Matt Ryan	9.3	5.8	3.6	2.9	24.32%	25.00%	67.57%	35.10%	8.11%	85.70%	12	3
#8	Luka Garza	6.7	4.1	4.7	4.3	48.94%	72.00%	14.89%	12.50%	36.17%	89.50%	13	2

Golden State Warriors

Proposed Vision

- The final model can predict the

  winning team with **65%+** accuracy!

Potential Impact

- Enhance decision-making for various stakeholders
- Inform betting decisions
- Improve fan engagement

Findings from preliminary EDA

G: Games Played

Min: Minutes Played

Pts: Points

Reb: Rebounds

Ast: Assists

Stl: Steals

Blk: Blocks

To: Turnovers

Pf: Personal Fouls

Dreb: Defensive Rebounds

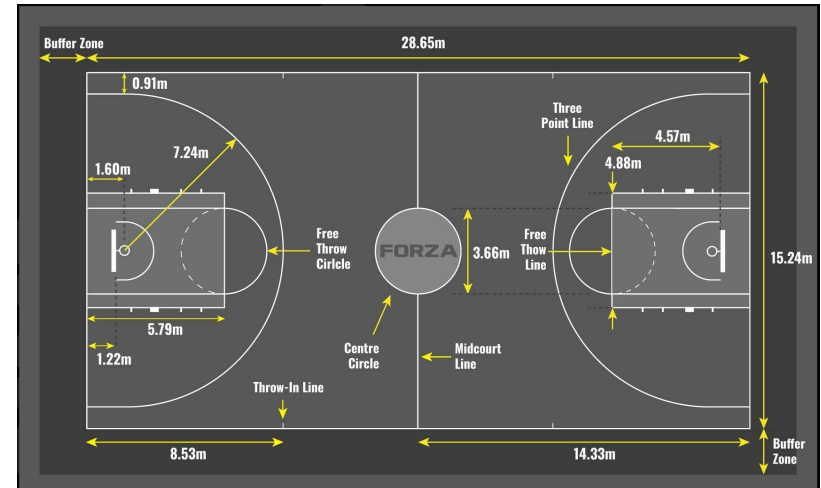Oreb: Offensive Rebounds

FG-Pct: Field Goal Percentage

3P-PCT: Three-Point Percentage

FT-Pct: Free Throw Percentage

Eff: Efficiency = Total Possessions/Total Points Scored ×100
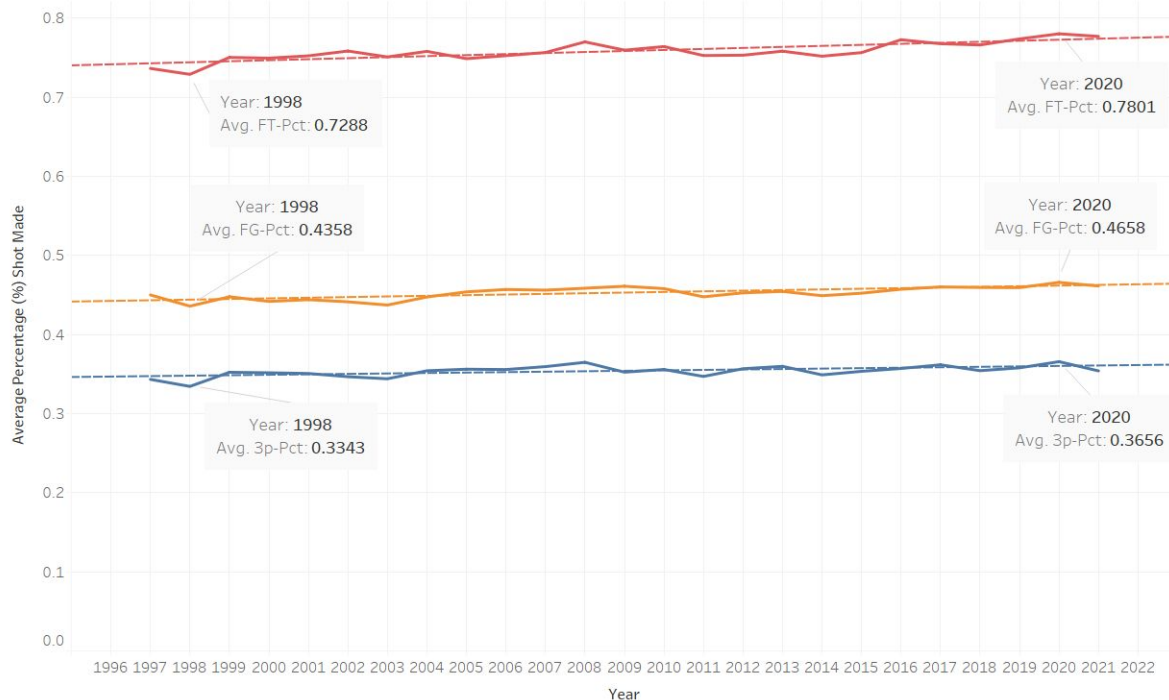
Deff: Defensive Efficiency = Total Opponent Possessions/Total Points Allowed ×100

Year: Year (Season Year)

Findings from preliminary EDA
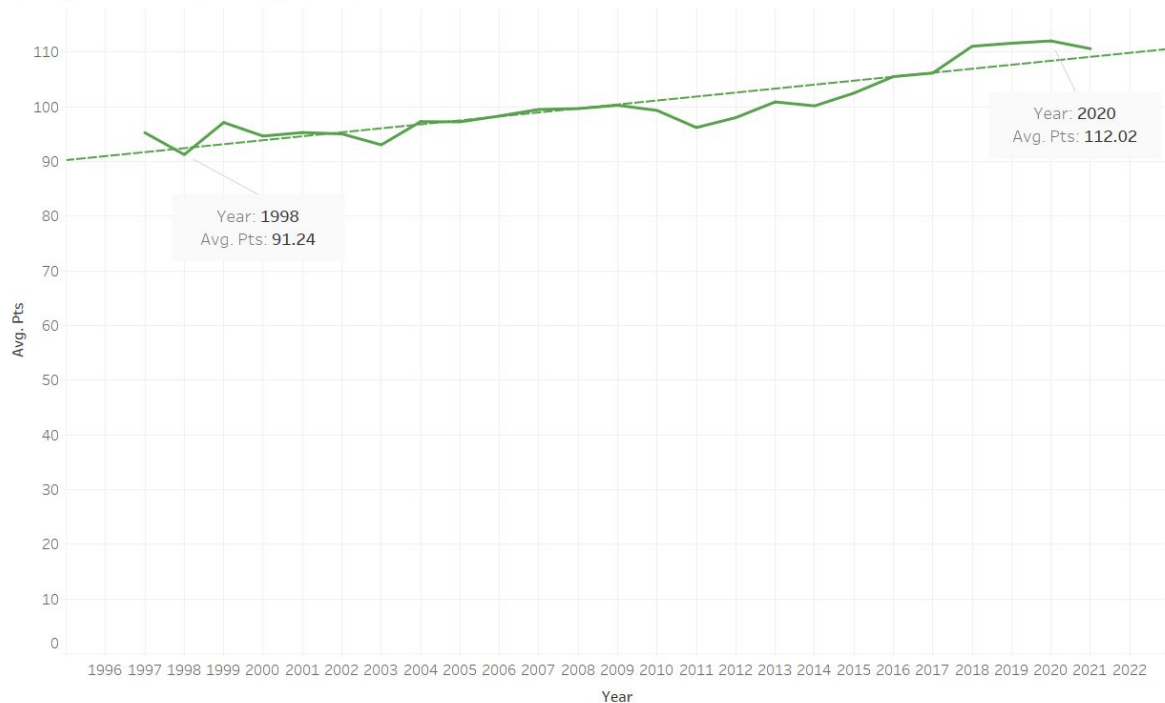
3 Way NBA Scoring Percentage (%) From 1997-2022

Measure Names
- Avg. 3p-Pct
- Avg. FG-Pct
- Avg. FT-Pct

Average Percentage (%) Shot Made
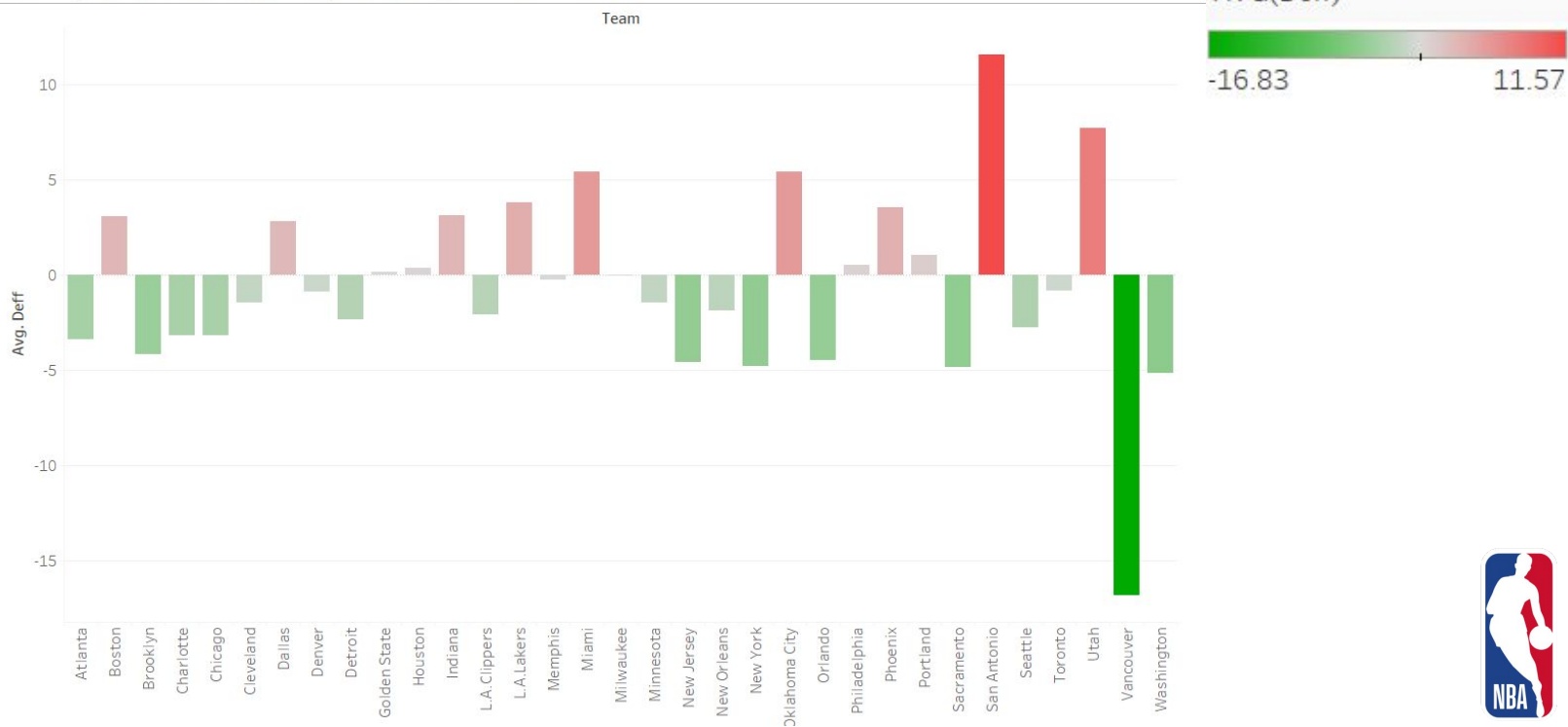
Year: **1998**
Avg. FT-Pct: **0.7288**

Year: **2020**
Avg. FT-Pct: **0.7801**

Year: **1998**
Avg. FG-Pct: **0.4358**

Year: **2020**
Avg. FG-Pct: **0.4658**

Year: **1998**
Avg. 3p-Pct: **0.3343**

Year: **2020**
Avg. 3p-Pct: **0.3656**

Year

Findings from preliminary EDA

Average Points Scored By NBA Teams 1997-2022

Year: **1998**
Avg. Pts: **91.24**

Year: **2020**
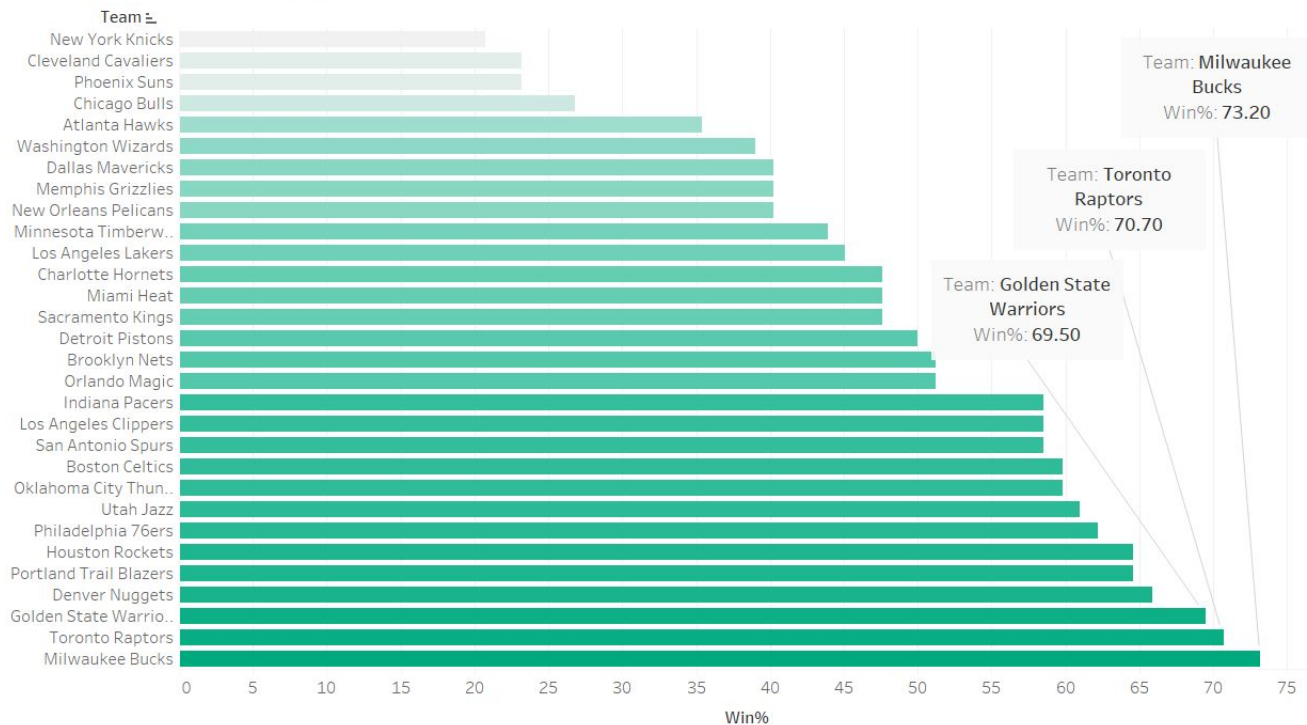Avg. Pts: **112.02**

Avg. Pts

Year

Findings from preliminary EDA

Average Defensive Efficiency of NBA Teams 1997-2022

Findings from preliminary EDA

NBA Teams By Most Wins 2018-2019

Next steps

- Potentially more data collection and EDA
- Identify/create relevant metrics/features for building baseline model
- Model selection and training
- Model evaluation and iterative improvements
- Test it out real-life and continuous updates

$y = b_0 + b_1 x$ ← Linear Model

Logistic Model

$$p = \frac{1}{1 + e^{-(b_0 + b_1 x)}}$$

NBA Odds

ACTION