NBA Win Shares

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Machine Learning with Player win shares

Overview

- Used Xgboost to estimate player win shares, a stat that measures players overall impact on winning games
- This will help us answer questions like:
    - Which players are expected to improve?
    - Which stats matter most for winning?
- This can impact how fantasy players draft their rosters, how teams can improve by trades and how coaches can make better decisions on player rotations.

Data Description

- Project used Historical data from 2018 - 2025

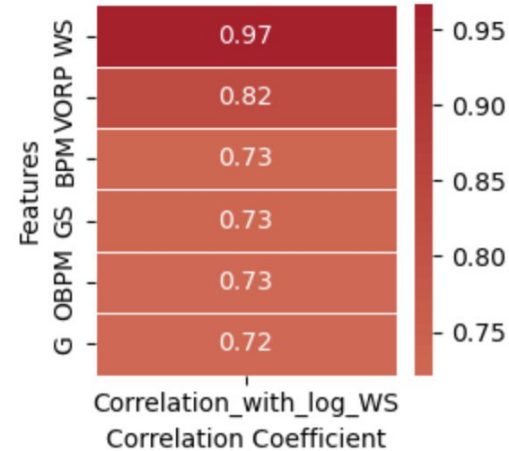|	
Data Source	Basketball Reference
Target Variable	Win Shares
Features used	VORP (Value over Replacement Player) , FG (Field goals made), TRB (Total Rebounds), FTA(Free Throws Attempted), MP(Minutes Played), GS (Games Started) , PTS (Points), G(Games Played), Year
Pipeline	Cleaned and filtered player stats, Selected key features, Trained ML models with the features, Evaluation using test data, Forecasted with chosen model.

Key Findings

1

Correlation

- Certain features Showed strong correlation with win shares
- Top Correlated Stat was Value Over Replacement Player
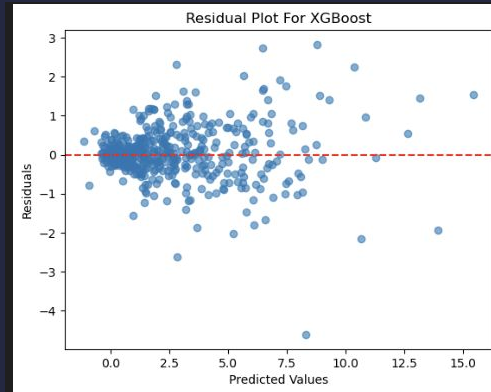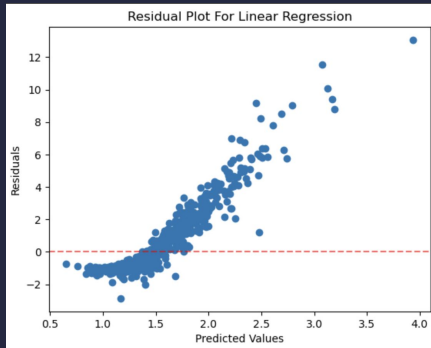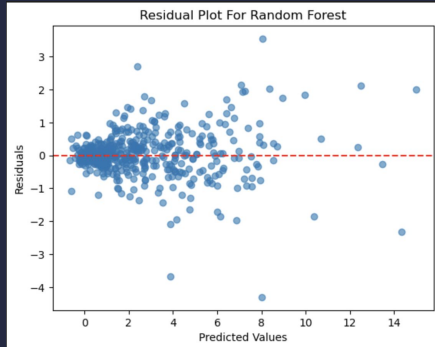- Box Plus/Minus was also correlated

2

Multicollinearity

- Remove feature candidates that were highly correlated with another

Top 5 Features Most Correlated with log_WS

Model Results
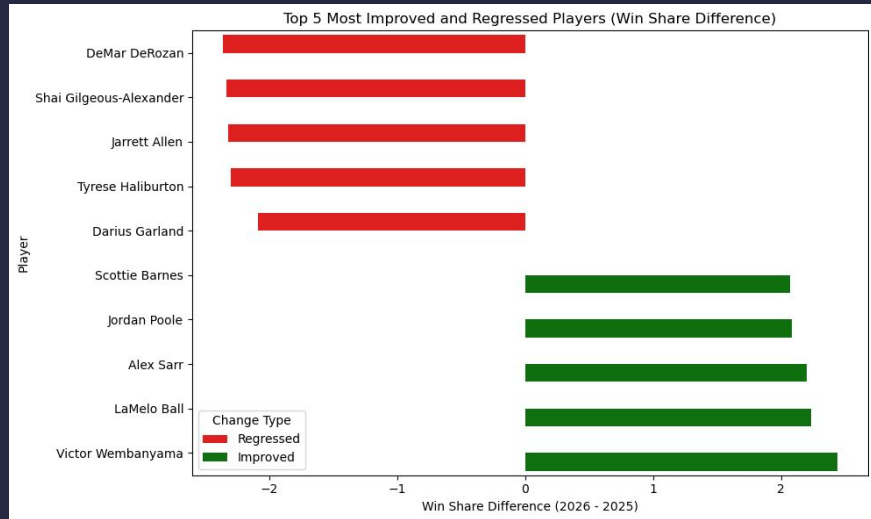
XGBOOST Model Result

Predicted Future WS

- Used historical data to forecast player win shares.
- Some players are projected to be more impactful to their teams than others.
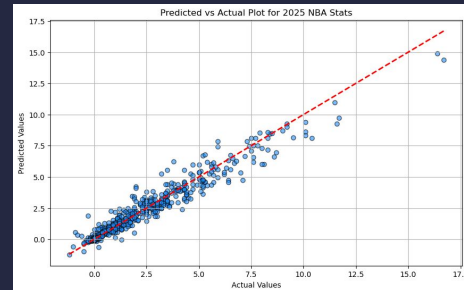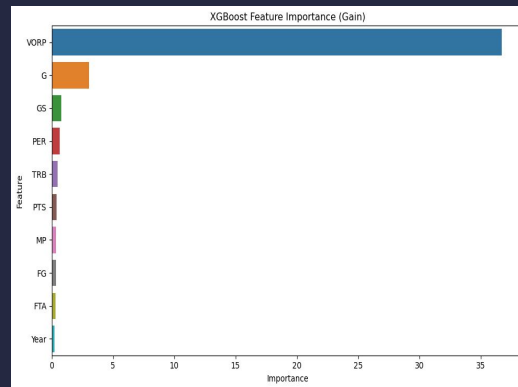- The Figure on the right shows 5 players who are projected to improve the most vs 5 players who became worse.

Top 5 Most Improved and Regressed Players (Win Share Difference)

Model Results

Feature importance

Value Over Replacement Player had the most impact for the model, this is the stat that matter the most when predicting win shares.

Predicted vs Actual Results

The predicted vs actual plot shows a great linear relationship. With some outliers because of star players. R2 of .94 and MSE of .38.

Screenshot of Dashboard

🏀 Player Win Shares Dashboard

🏃 Tyler Herro's Win Shares

2025 Win Shares
7.40

2026 Win Shares
7.46

Win Share Diff

0.06

🏀 Player Win Shares Dashboard

🏃 Victor Wembanyama's Win Shares

2025 Win Shares
3.80

2026 Win Shares
6.24

Win Share Diff

2.44

Next Steps

- Add more complex features to the dashboard.
- Account for injuries, Age and other types of variables for predictions
- Update rosters that will correlate with the next NBA season.

Thank You!

DO YOU HAVE ANY QUESTIONS?