Sports Analytics Group 1

MLB Field Positioning

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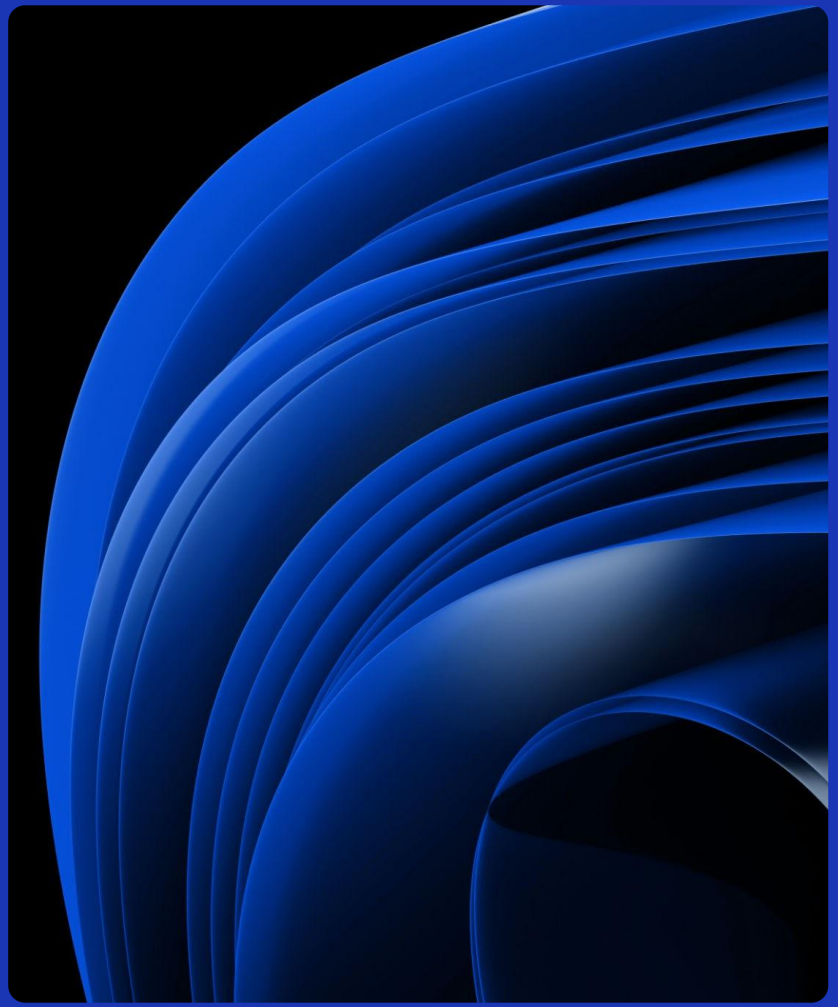


Brainstorming

- Correlation between fielders switching and effectiveness against batters.
- Batters
  - Difference in wOBA vs different fielding adjustments.
  - Spray charts of recorded hitting locations.
- Fielders
  - Heatmaps of regular vs shifted fielder positioning.
    - How extreme certain players shift when out of regular alignment

Data Sources

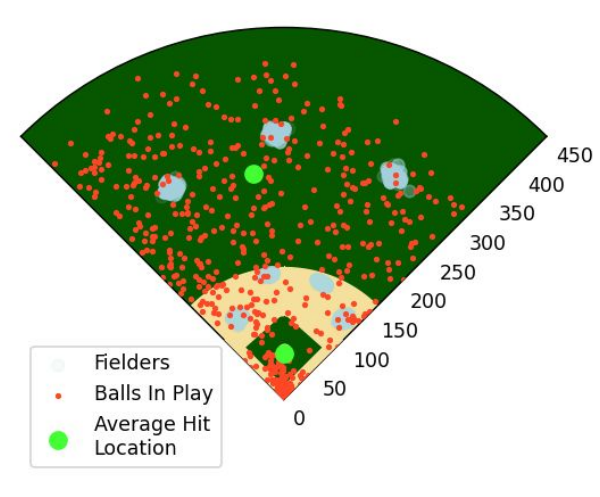
- Positioning
  - Player name with different positions played
  - Includes distance and angle for facing batters (R vs. L)
  - Standard vs Shifted Alignment
- Fielder Data
  - Fielder Data pulled through PyBaseball
  - Alignment type, Fielder names, wOBA values

Methodology

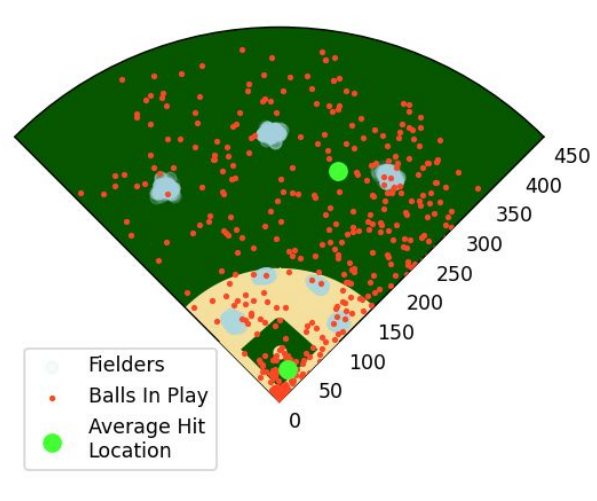
1. Data Collection & Preprocessing
    a. Pybaseball API & Situational Fielding Dataset
    b. Data Cleaned both the datasets
2. Feature Engineering
    a. Numerically encoded fielding alignments
    b. Calculated the depth of the fielders for each alignments
3. Visualization & Analysis
    a. Heatmaps: Showed how defensive alignment impacted offensive performance (wOBA)
    b. Positioning Charts: Shows the average fielder positions for each batter at bat.

Most Pull/Oppo Heavy Hitters

- These are the hitters with the highest Pull% and Oppo% from 2023-2024
- A pulled ball is one that is hit to the same side that a hitter is standing
    - e.g., a right-handed batter hitting a ball to left field
- Both of these batters are right-handed



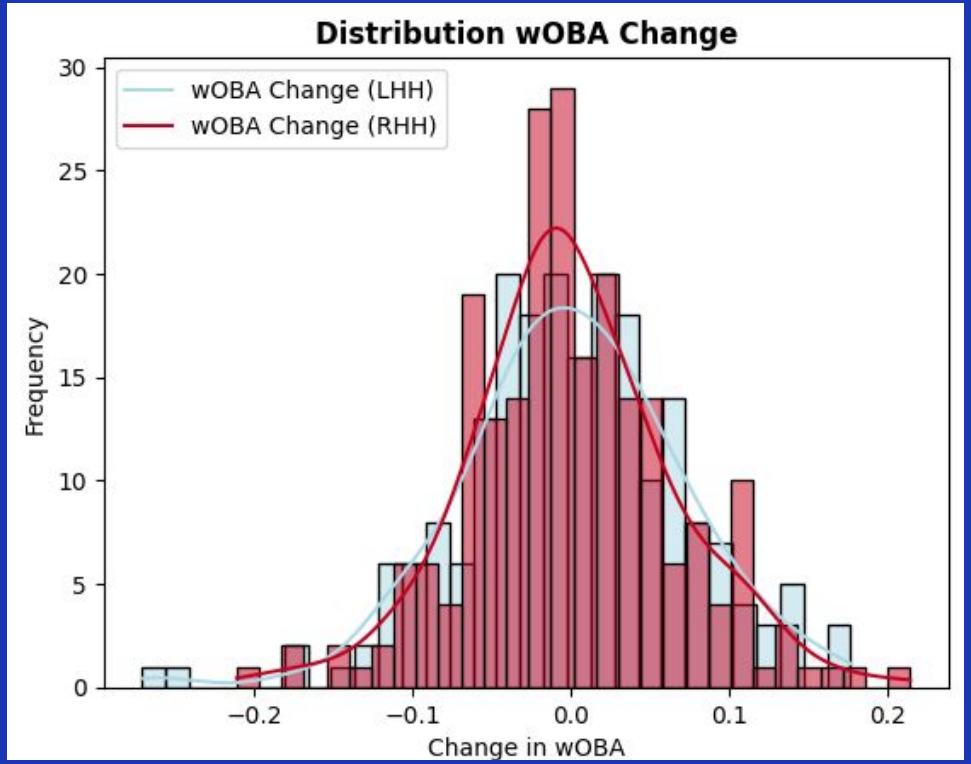
Most Pull-Heavy Batter: Isaac Paredes



Most Oppo-Heavy Batter: Bo Bichette

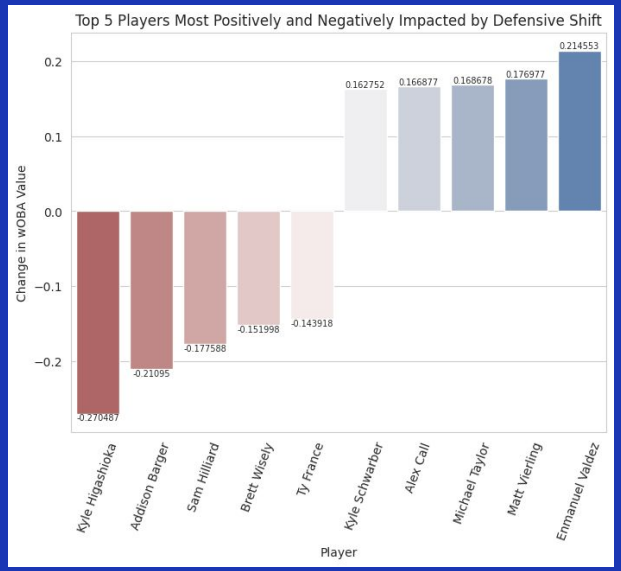
Batter Effectiveness

- In general, neither right-handed nor left-handed hitters are significantly impacted by defensive positioning
- Individual players, however, can be significantly impacted both positively and negatively by the shift

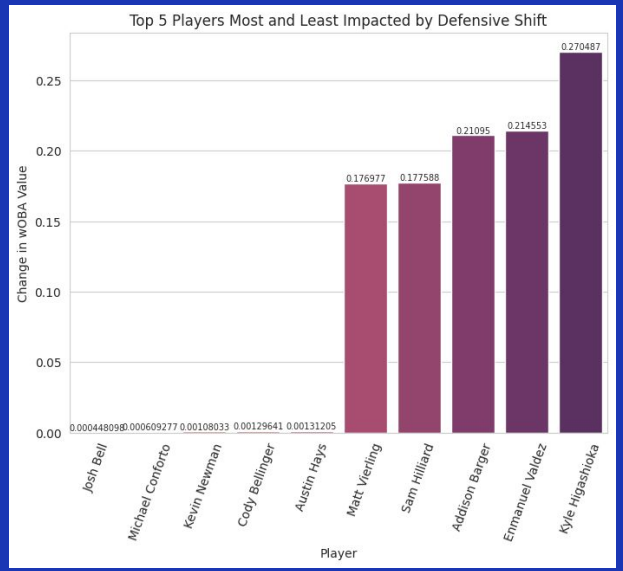


Batter Effectiveness

- Batters in the red are hurt the most when the defense is shifted
- Batters in the blue perform the best compared to their typical performance against the shift

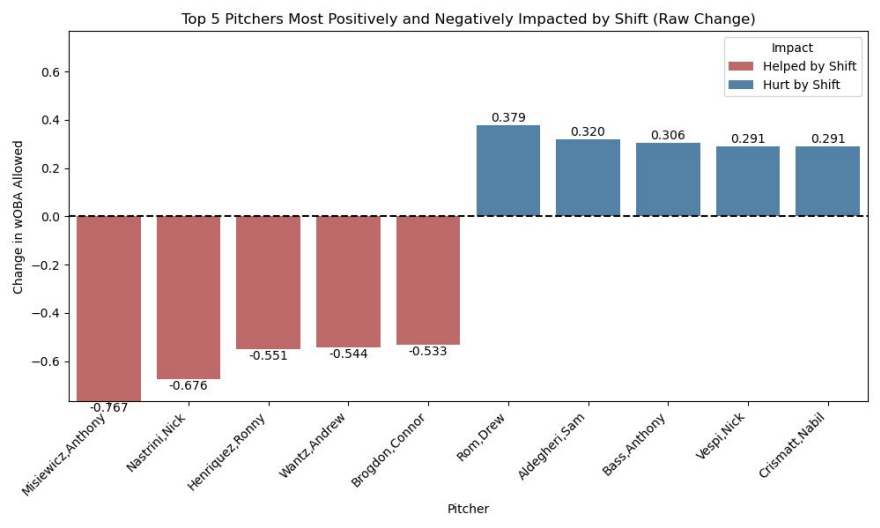


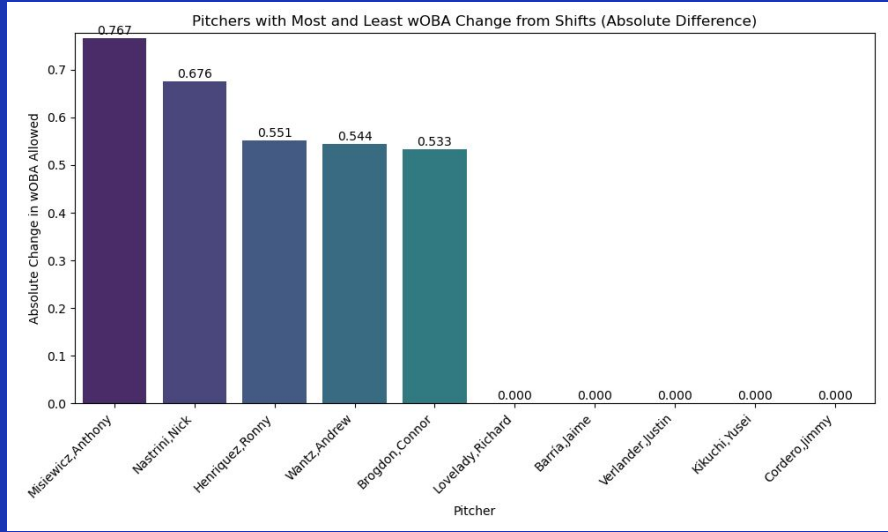
- Batters on the left are the least impacted by the shift
- Batters on the right are the most impacted by the shift



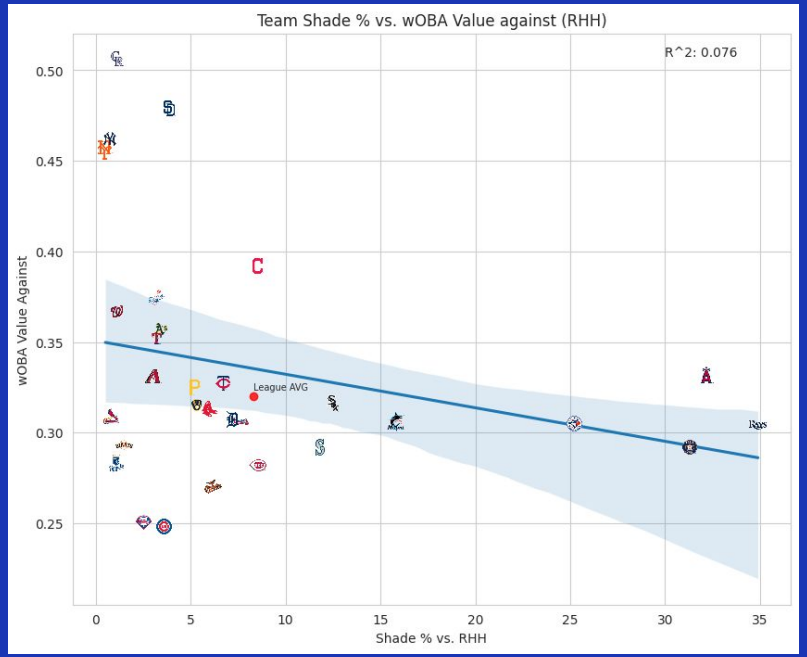
Pitcher Effectiveness

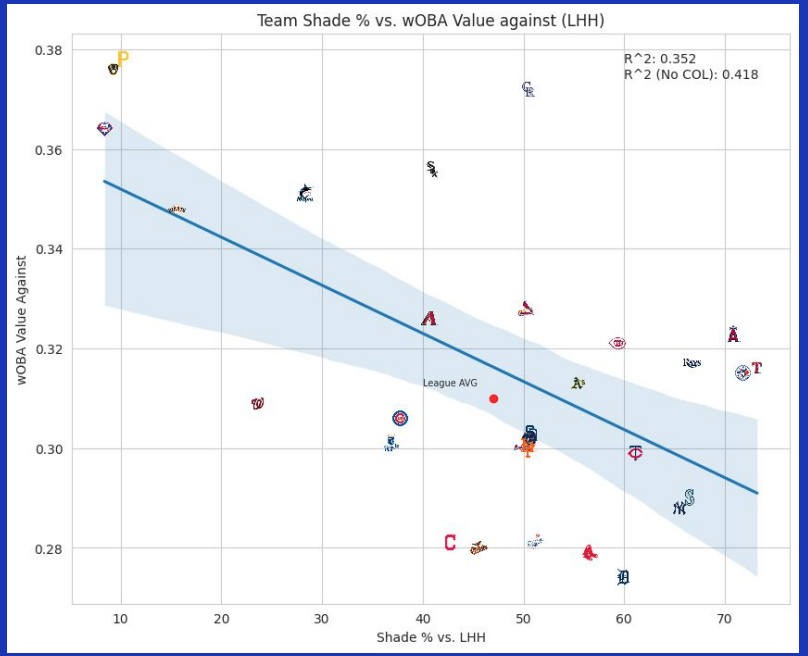
- Pitchers in the red benefit the most from defensive positioning
- Pitchers in the blue are hurt the most by their defense's positioning
- Pitchers on the left are the most impacted by the shift
- Pitchers on the right are the least impacted by the shift





Team Tendencies





Shiny App

Select Batter

Aaron Judge

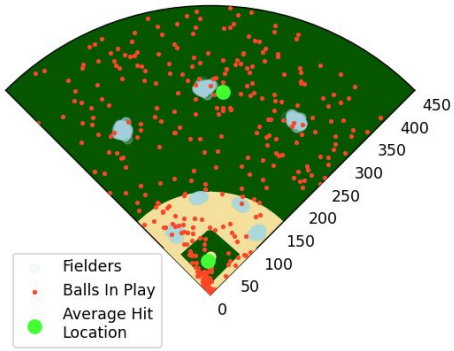
Infielder Alignment
- Standard
- Shifted

Outfielder Alignment
- Standard
- Shaded

Batter Effectiveness vs. Strategic Fielder Positioning

wOBA	Change in wOBA From Standard Alignment	At Bats
0.608	0.0	412

Spray Chart



Limitations

- Shift rule changes in 2022
  - Data is from 2023-2024
- Team errors influences wOBA
- Not including game situation
  - Potential runners on base
- Different parks affect outfielder and hit charts
- Slight changes through pitch count

Application/Future Expansion

- Comparison before vs after shift rule changes
- Further limitations on what players to account for (starters only, 100+ at bats)
- Combining data with game situation
- Integrating pitching type
    - Differences in wOBA
- General expansion of savant data

References

MLB Situational Fielder Positioning | baseballsavant.com

Statcast Search CSV Documentation | baseballsavant.com

2024 Major League Baseball Standard Fielding | Baseball-Reference.com

MLB Database | Baseball Statistics Data | SportsDataIO

Shifts | Glossary | MLB.com

Thank You!