STAT375: NBA Player Position, Speed and Rebounding

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Section 1

Introduction

Introduction

- SportVU data
- Professional Teams

Figure 1: 2020 NBA Finals

Research Questions

- How does one work with a large amount tracking data?
- How does player position and speed at the moment of rebounding affect the probability of scoring points on the next play by the team that rebounded?
- How does the average speed of players (hustle) on opposing teams affect whether the next play generates points or not at the moment of rebound?

Figure 2: Tracking Data

Data

- SportVU Data
- `nbastatR`
- 28 Ramdomly Sampled Games

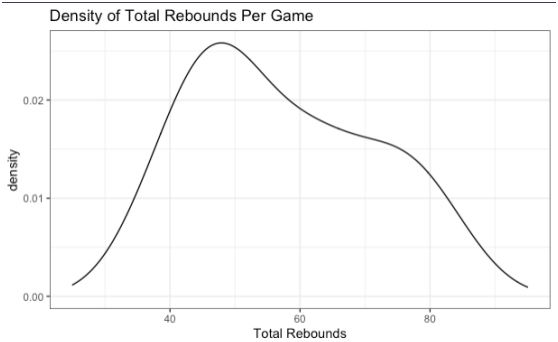


Figure 3: Density of Total Rebounds Per Game

Previous Work

- Miller's Possession Sketches
- Andruzzi's Position and Speed

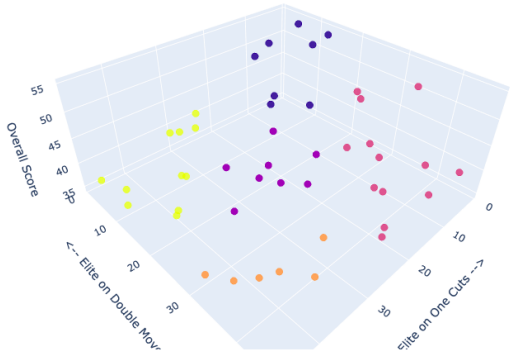


Figure 4: Clustering Analysis Using Players Position and Speed

Initial Data Exploration

Detroit Pistons vs. Atlanta Hawks

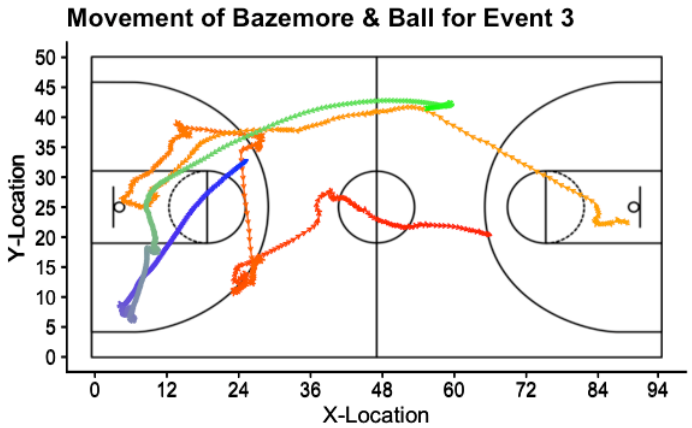


Figure 5: Movement of Bazemore and Ball for A Rebounding Event

More Data Exploration

Los Angeles Clippers vs. Memphis Grizzlies

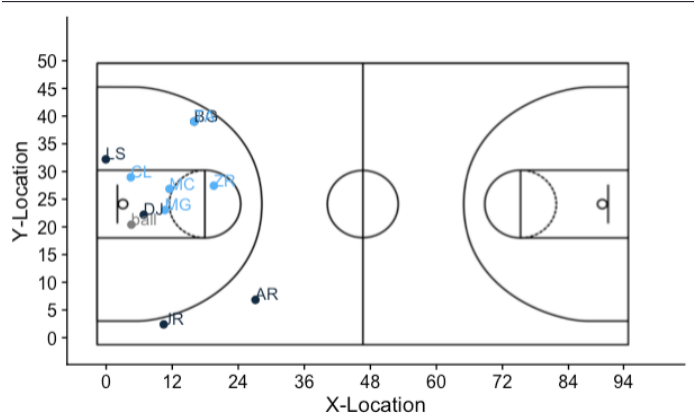


Figure 6: Player Positions at Time of a Rebound Event

Section 2

Methods and Analysis

Wilcoxon Rank Sum Tests

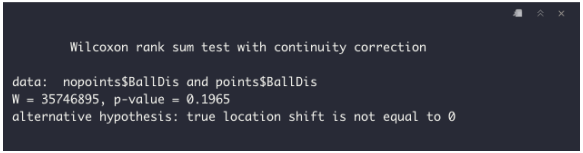


Figure 7: Test Results for Position

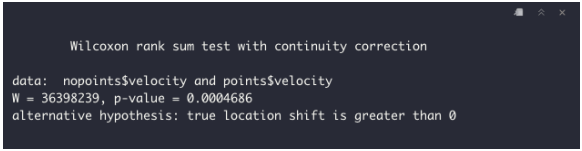
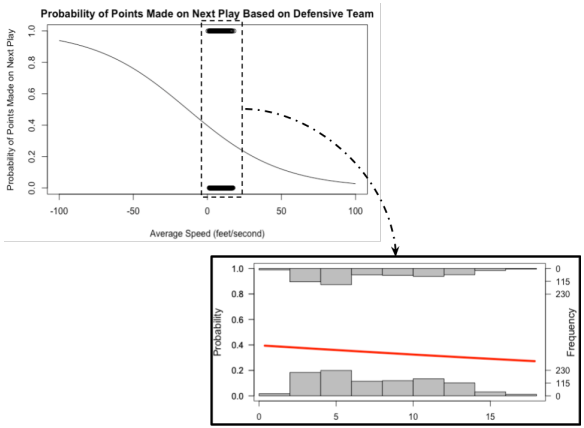
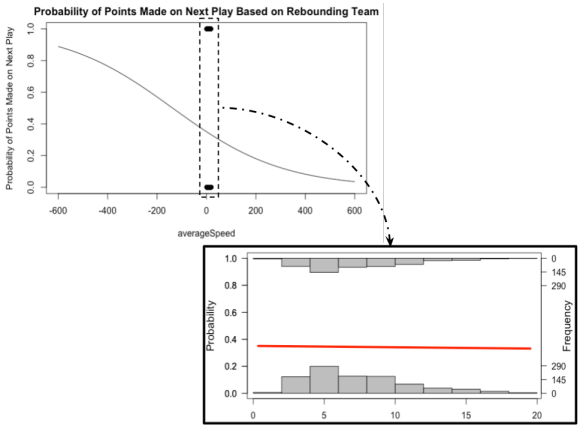


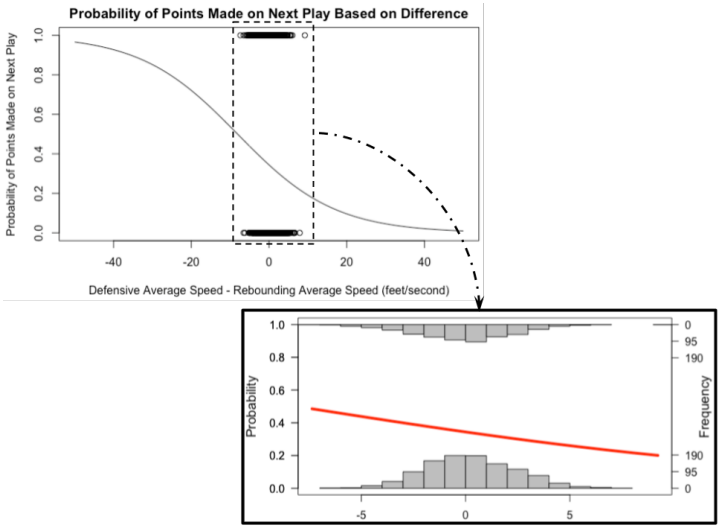
Figure 8: Test Results for Speed

Logistic Modeling





Difference


Probability of Points Made on Next Play Based on Difference
Probability of Points Made on Next Play
0.0
0.2
0.4
0.6
0.8
1.0
-40
-20
0
20
40
Defensive Average Speed - Rebounding Average Speed (feet/second)
Probability
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
0
95
190
190
95
0
-5
0
5

Summary of Results

- Player distance to the ball did not a have a significant relationship with scoring points on the next play
- Speed of all 10 distinct players on the court had a significant relationship with scoring points on the next play
- Speed of players on the rebounding team did not translate to an increased likelihood of scoring on the next play
- Greater average speed of the rebounding team as well as the greater the difference of average speed for the defending team over the rebounding team led to significant, but relatively small, decreases on probability of scoring for the rebounding team

Section 3

Conclusion

Data Wrangling Challenges

Figure 9: Big Data

Limitations

- One season of data
- Offensive and defensive rebounds were not distinguished
- State of game during rebound varies widely

Extensions

- Time left on shot clock and game
- Movement of the ball right after the rebound

Figure 11: Dame Time

Section 4

REFERENCES

Thank You

Hope you enjoyed our presentation!

References

Andruzzi, J. (2021), "Defender Evaluation: One-Cut Routes + Double Moves," *Kaggle*, Kaggle. https://www.kaggle.com/jdruzzi/defender-evaluation-one-cut-routes-double-moves.

Miller, A., and Bornn, L. (2017), "Possession Sketches: Mapping Nba Strategies," *MIT Sloan Sports Analytics Conference, 2017*.

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