



# Evaluating Passing Metrics in Soccer

Jordan Betterman, Kaden Whitlow, Parker Schlick, Eric Manley (Mentor)

Department of Mathematics and Computer Science, College of Arts & Sciences, Zimpleman College of Business



## Abstract

Analytics in Soccer is growing exponentially every year. With new metrics being created, sometimes we can't tell if these advanced metrics are statistically significant compared to simpler metrics that already exist. One metric that has exploded onto the scene is packing. Packing is the measure of defenders that were by-passed from either a pass, cross, or dribble. Our research group wanted to identify if packing (specifically packing via passing) is a statistically significant metric compared to other passing variables through correlation coefficients. We compared packing to simple metrics including total passing distance, ground passing distance, medium height passing distance, high passing distance, and expected goals from StatsBomb's Free 360 Events dataset. This dataset tracked all the events that occurred in each game of the Euro 2020 Tournament. We compared these variables to expected points, which shows how dominant a team was in a game. In conclusion, we found that there are simpler metrics that are more highly correlated with a team's dominance in a game than packing is.

## Research Question

Is packing a significant predictor of a team's success in a match?

## Variable Definitions

**Packing** = The measure of defenders that were by-passed via a pass.

**xP (Expected Points)** = Expected value of points gained by simulating a match a certain number of times.

**Expected Goals (xG)** = Summation of the probability of each shot being scored.

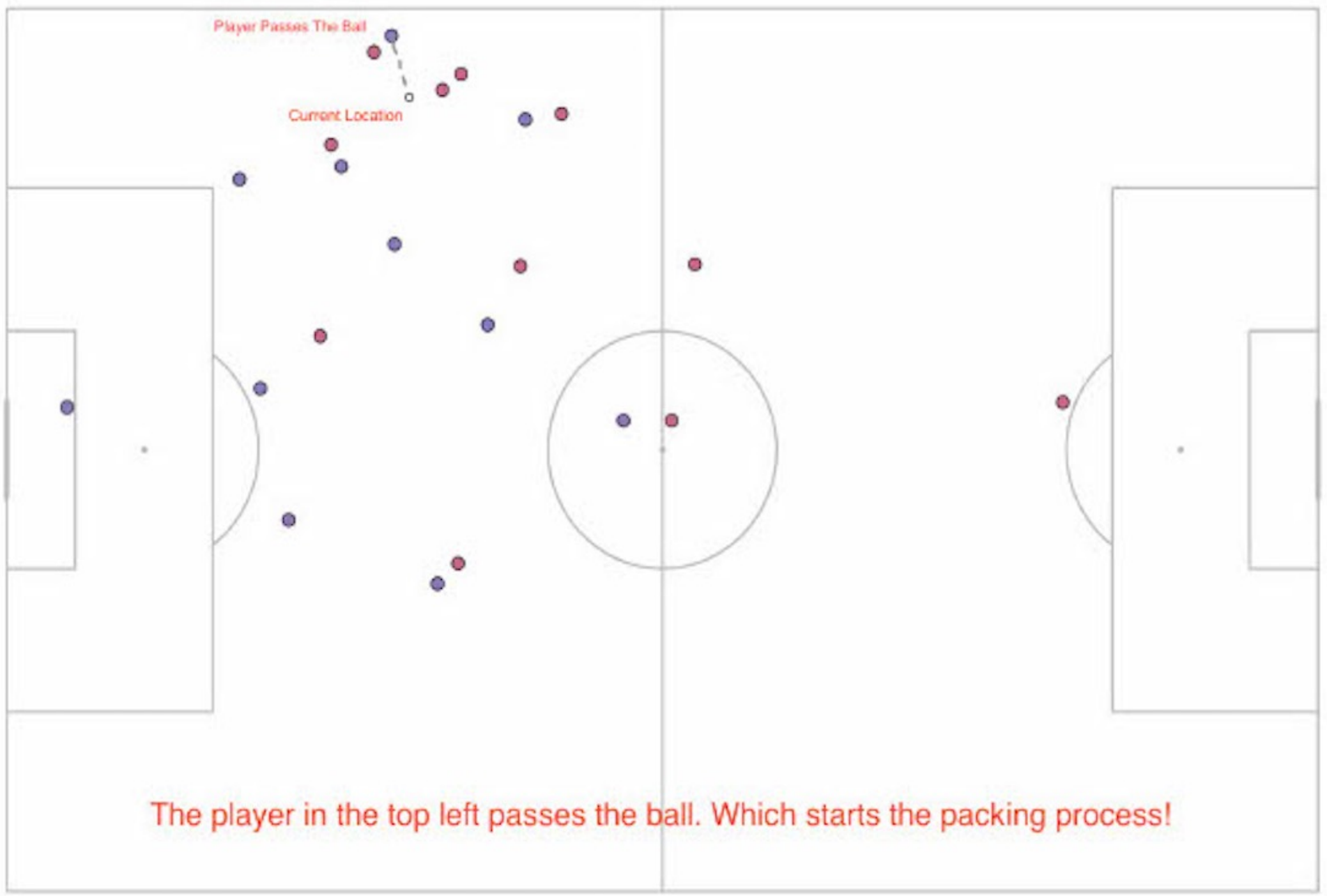
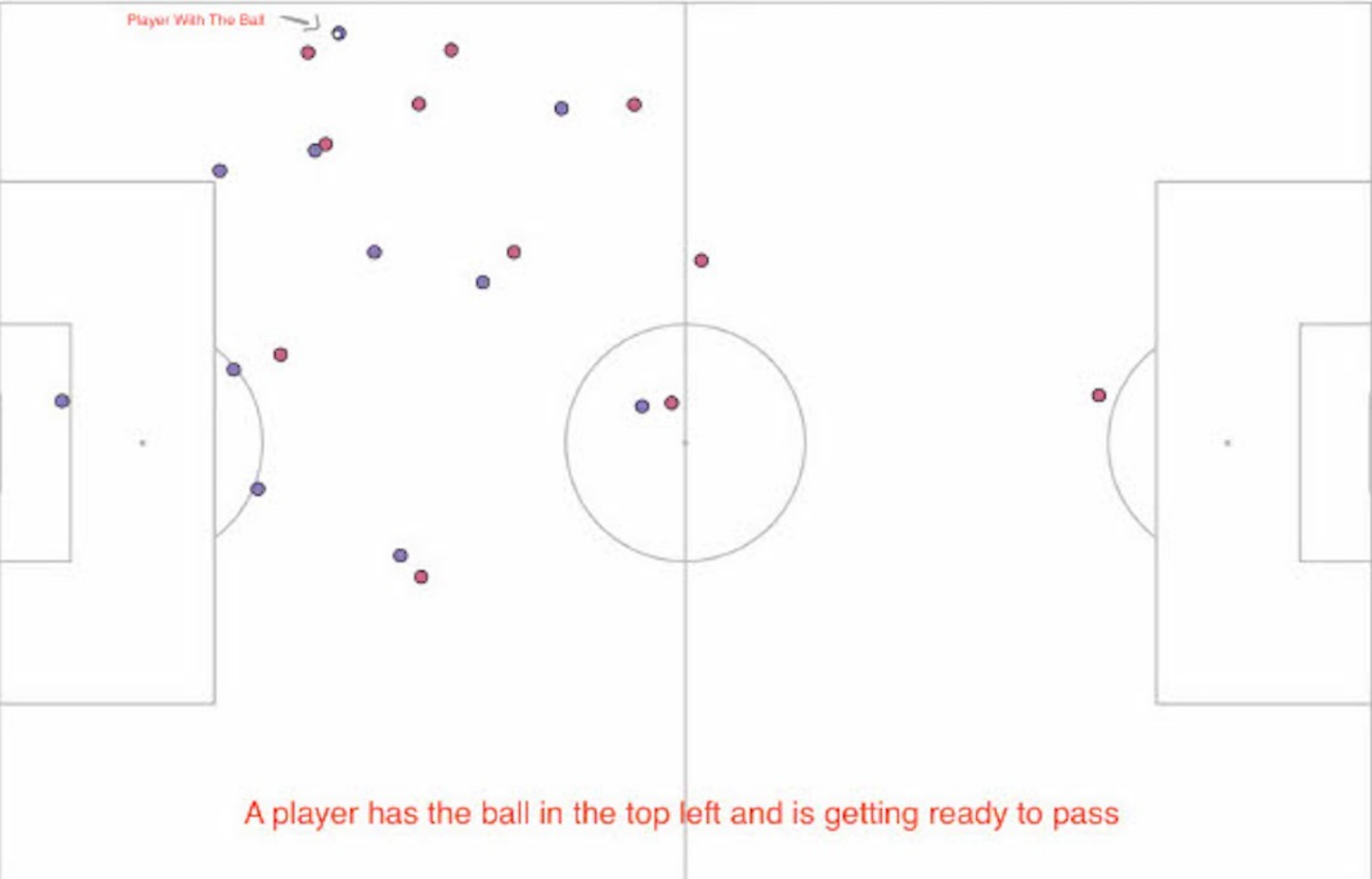
**Total Passing Distance** = Total yards all passes covered

**High Pass** = A pass that peaked above shoulder height

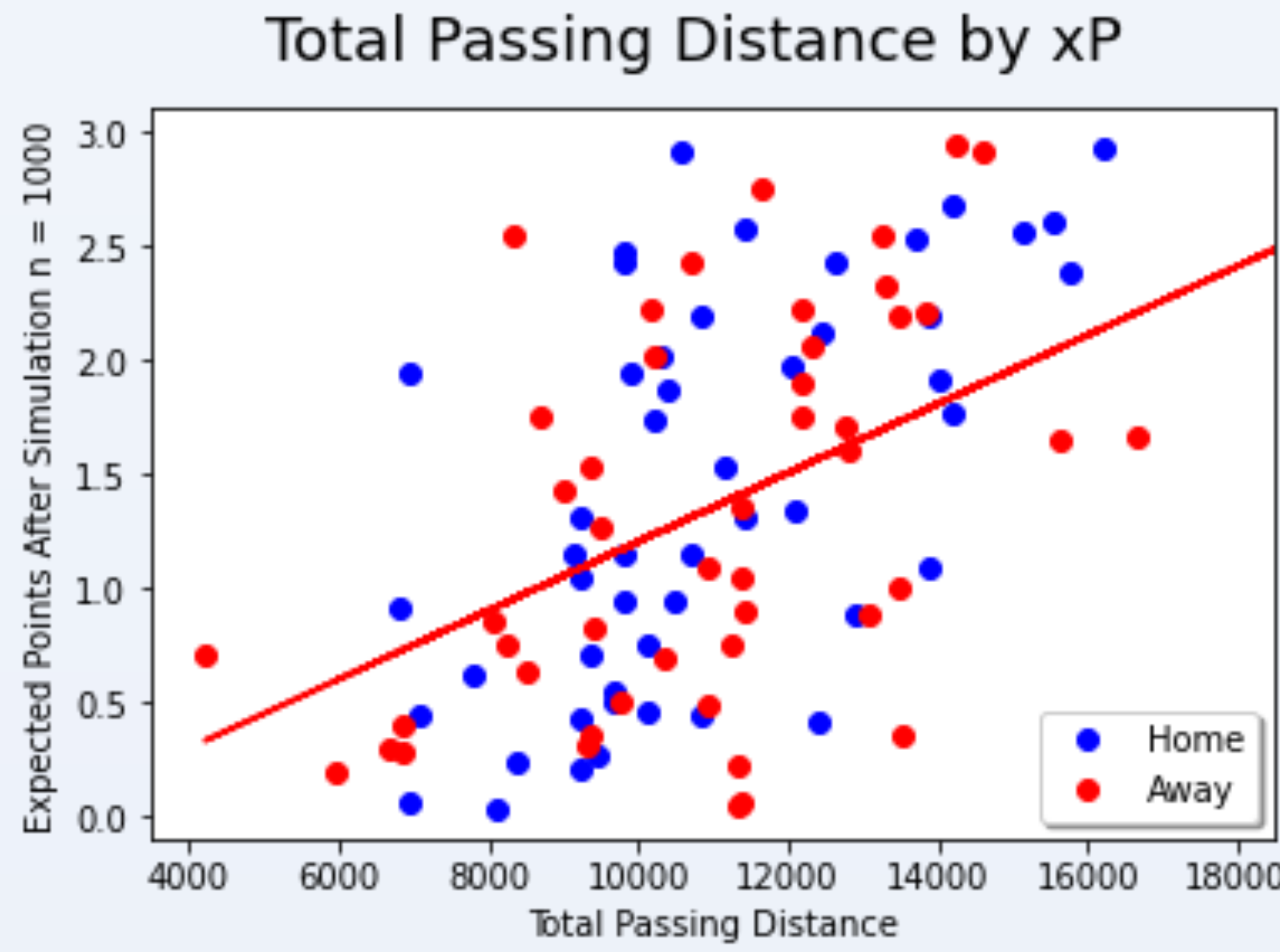
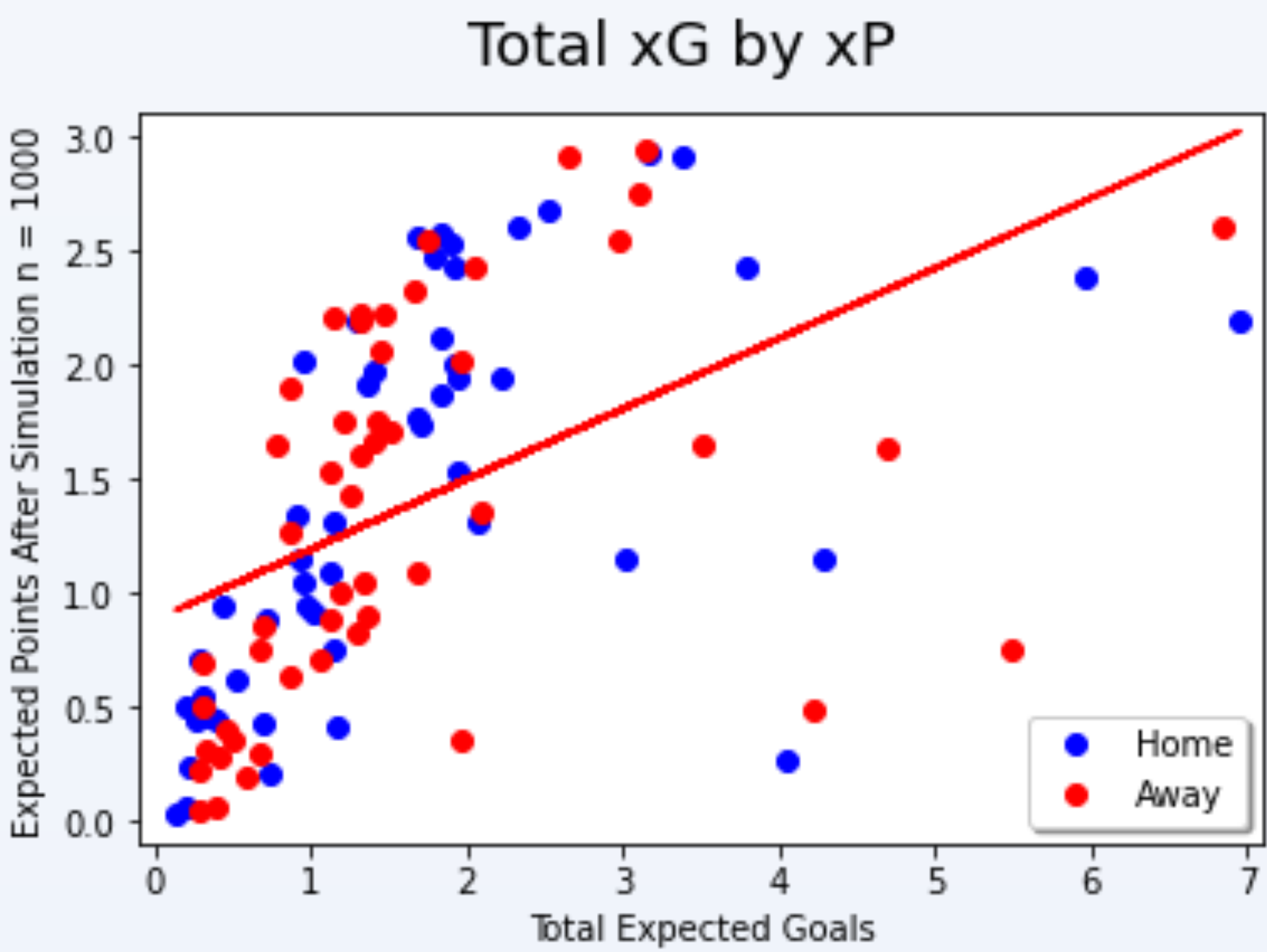
**Low Pass** = A pass that leaves the turf but stays below shoulder height

**Ground Pass** = A pass that stays on the ground

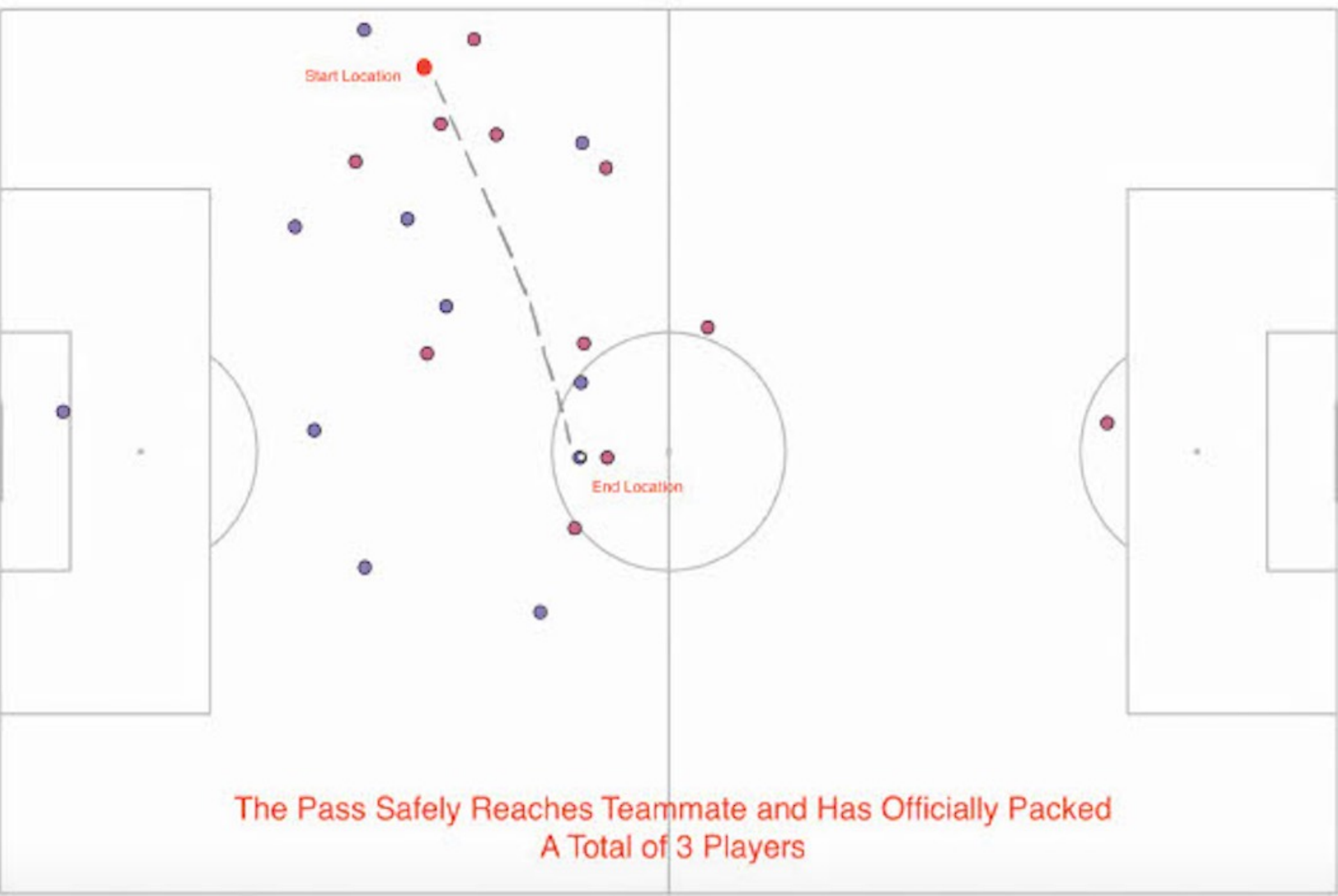
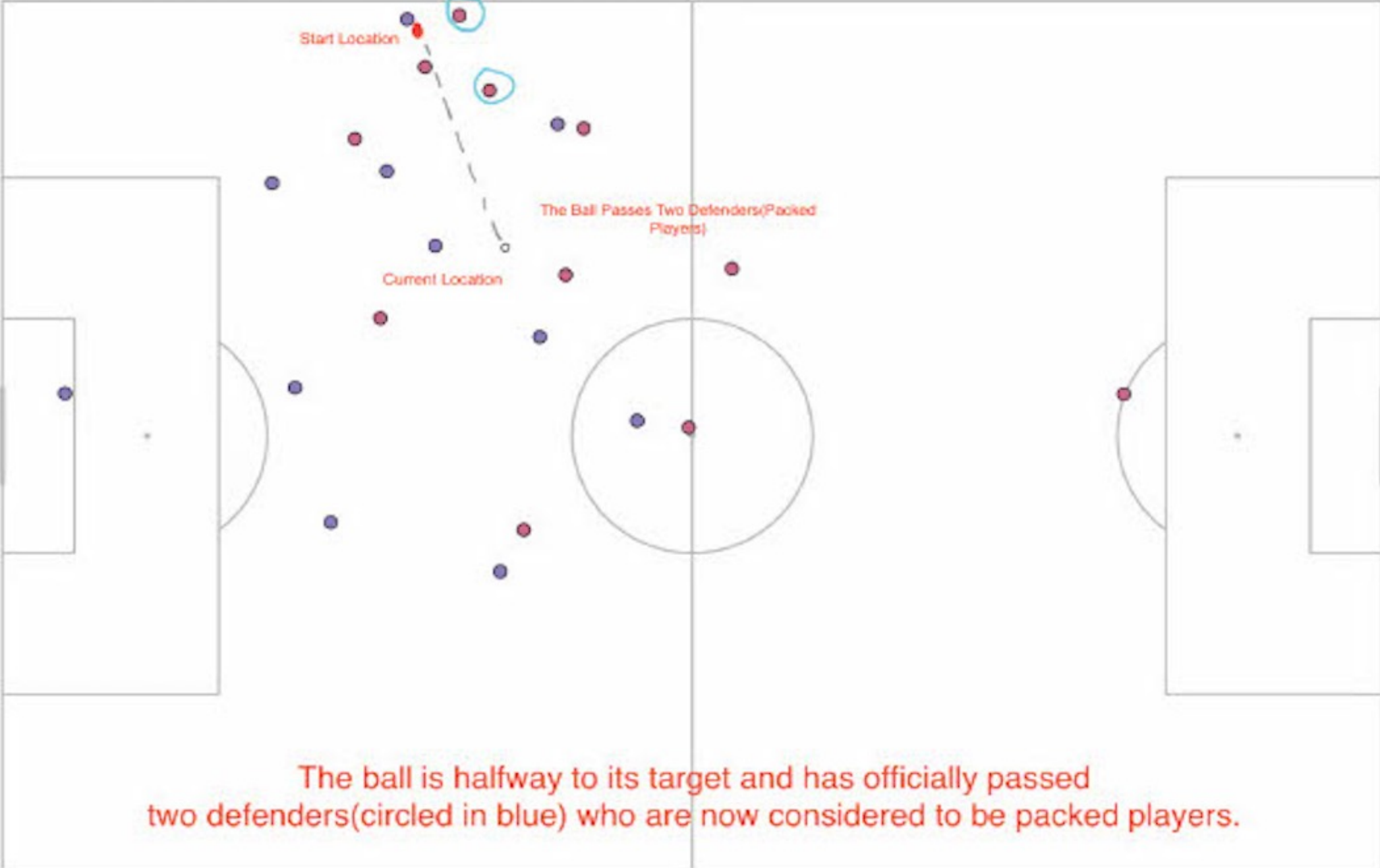
## Packing In Action



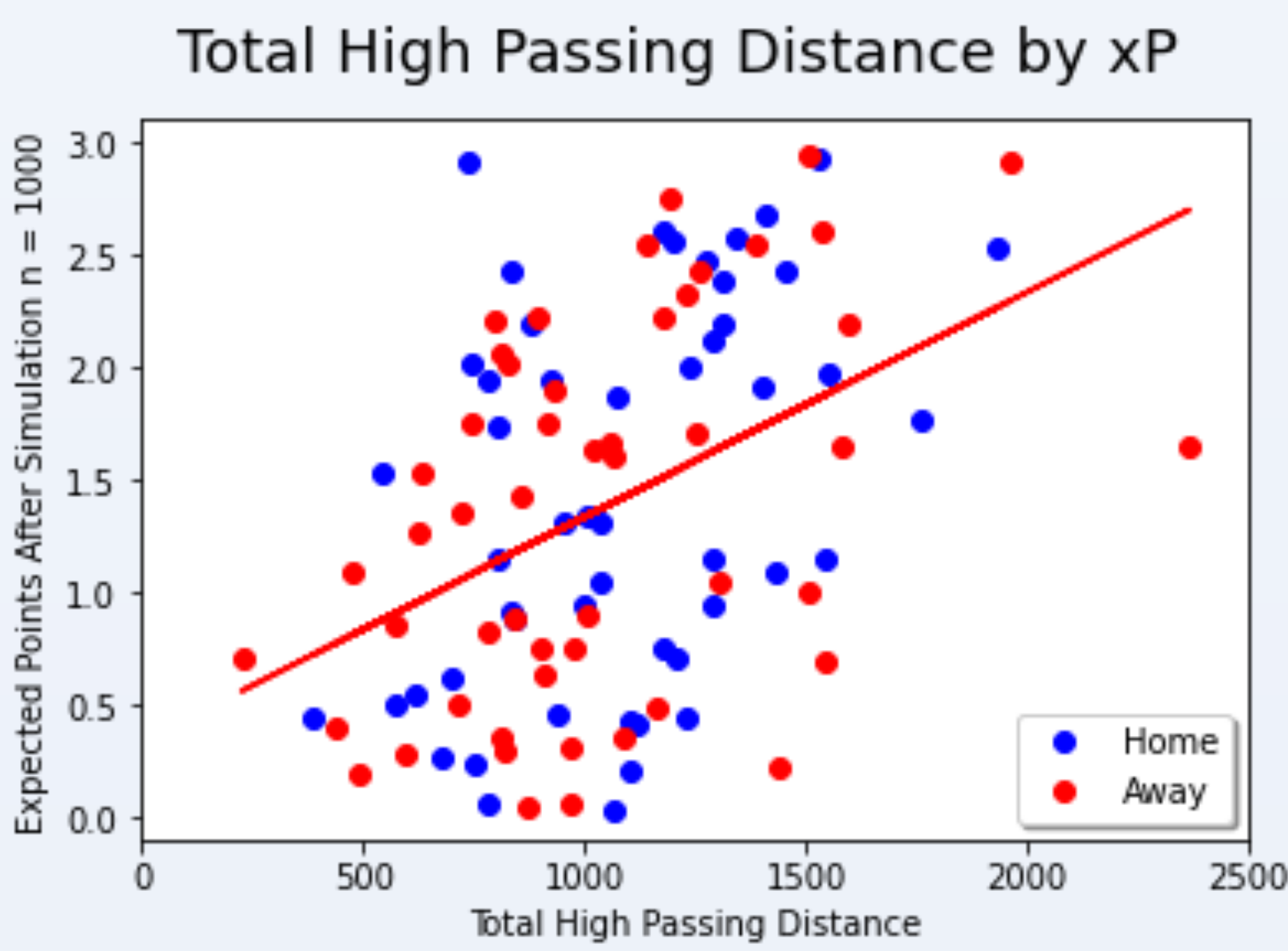
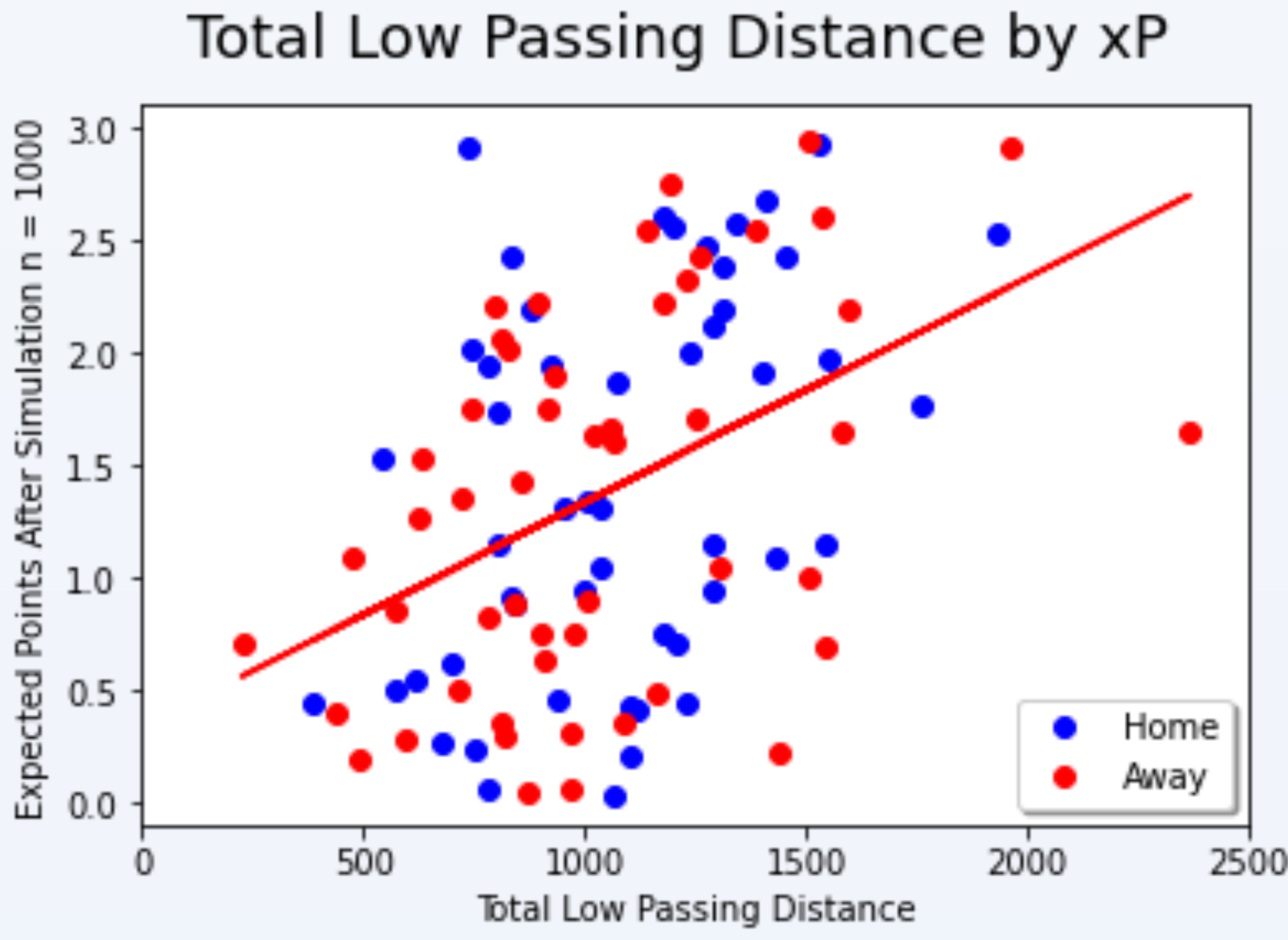
## Results



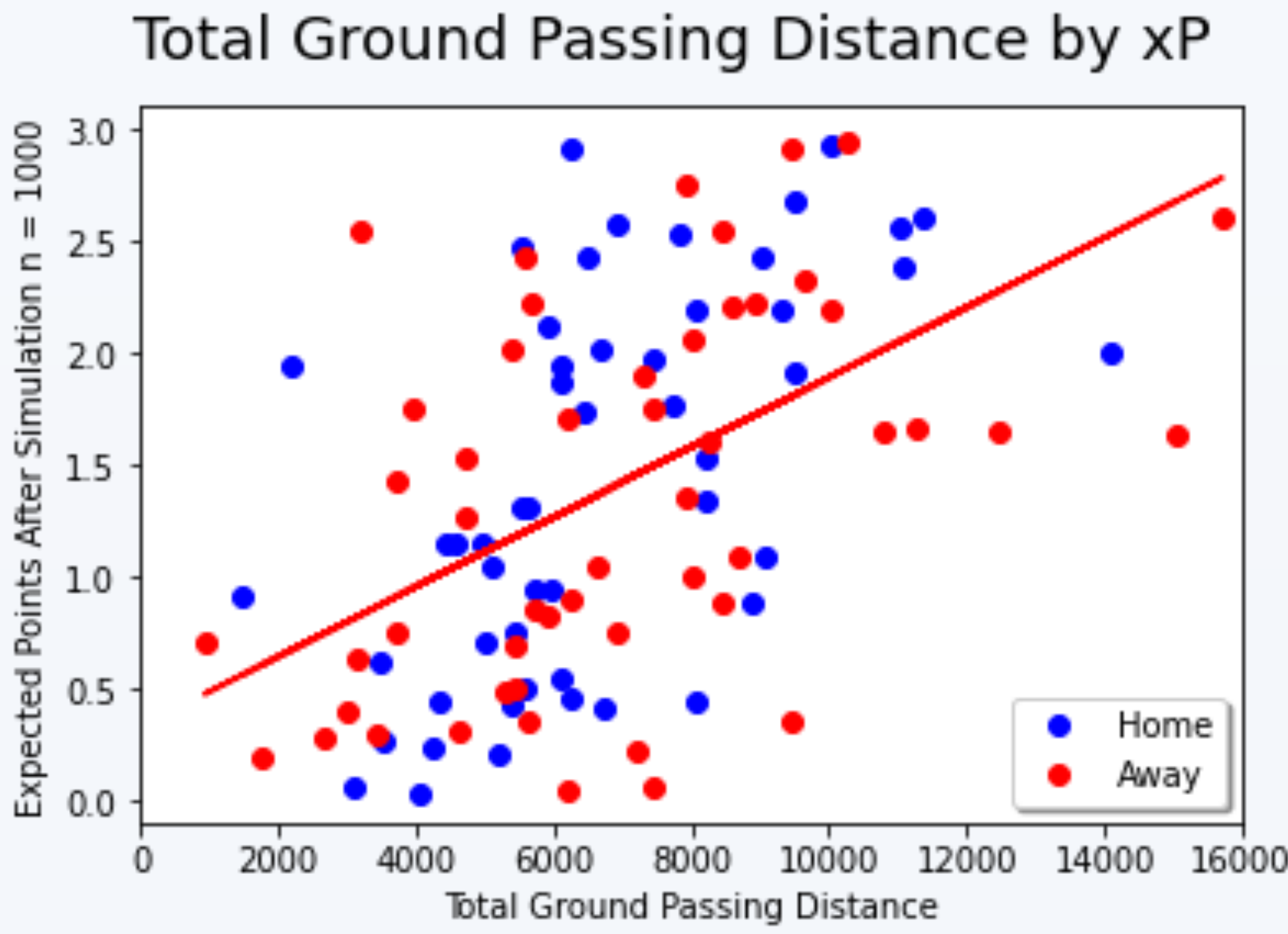
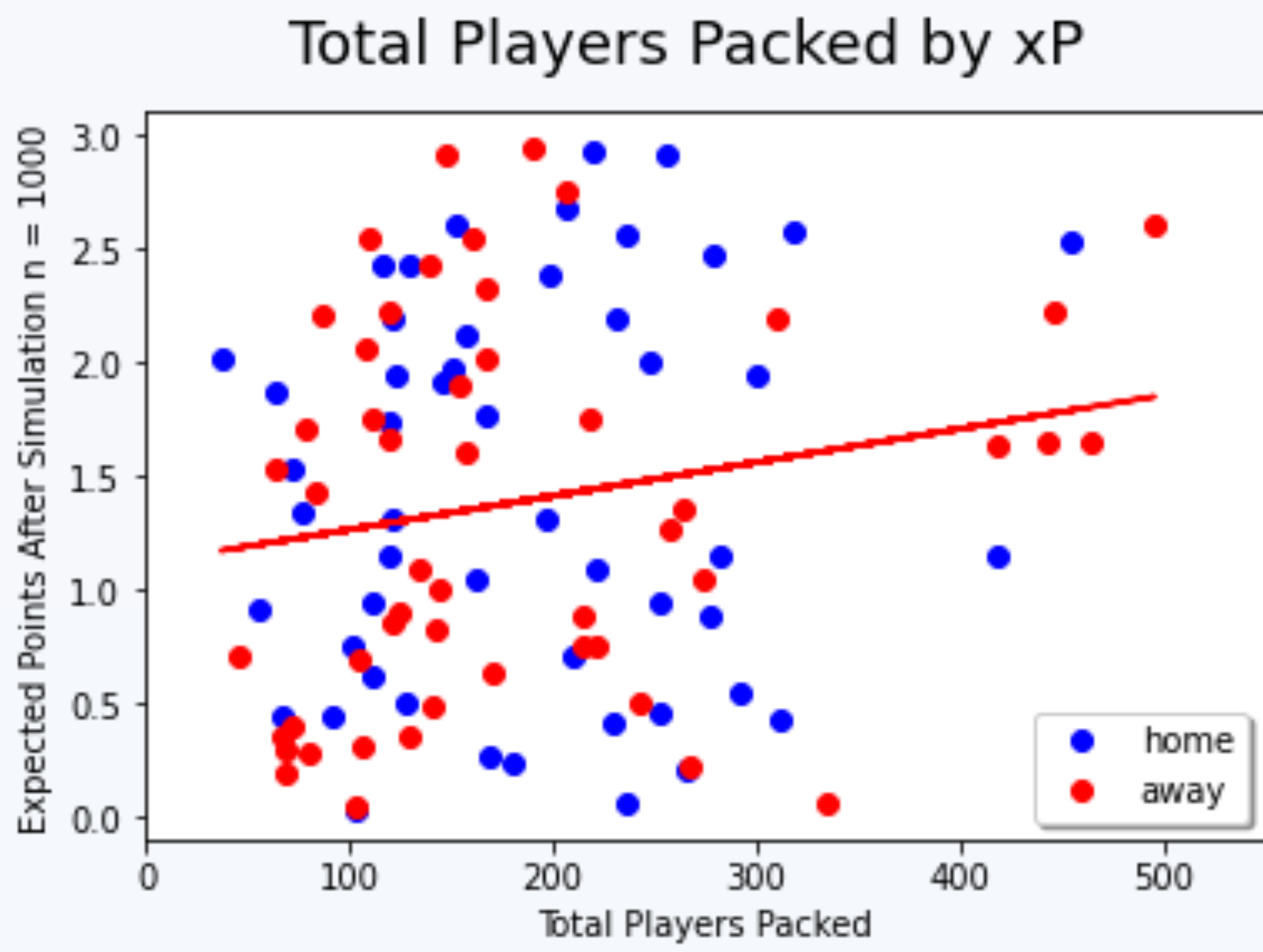
## Packing In Action



## Results



## Results



## Correlation Coefficients Evaluating xP

Variable	Correlation
Total Passing Distance	0.527716
Total Ground Passing Distance	0.511203
Expected Goals	0.502493
Total Low Passing Distance	0.426689
Total High Passing Distance	0.426689
Packing via Pass	0.177734

## Conclusion

We concluded that packing is an insignificant variable when evaluating a team's success in a game. But there are simpler variables, like passing distance, that better predicts a team's success.

## References

<https://github.com/statsbomb>

## Acknowledgements

We would like to thank Omar Badran of the Des Moines Menace and Loudoun United for his help in formulating the problem and his subject matter expertise.