Forced Turnover:
Evaluating Pressing Effectiveness in Soccer

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Background

Pressing in soccer is a defensive tactic where opposing players apply coordinated pressure on the offensive ball carrier with the intent to force turnovers and create goal-scoring transition opportunities.

Main Question: Can the effectiveness of a press in soccer be predicted using factors such as spatial context, pressing dynamics, game context and situational factors?
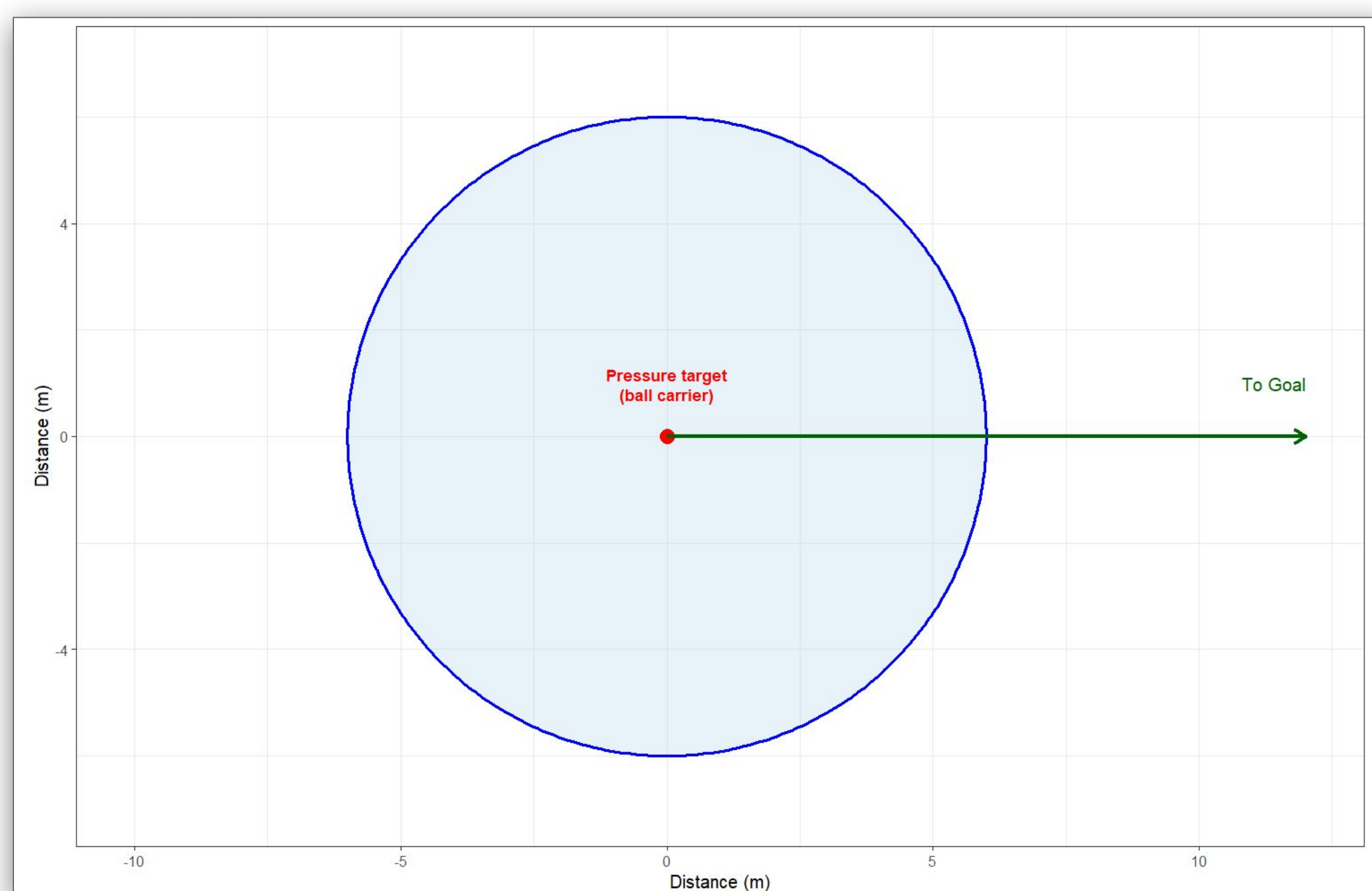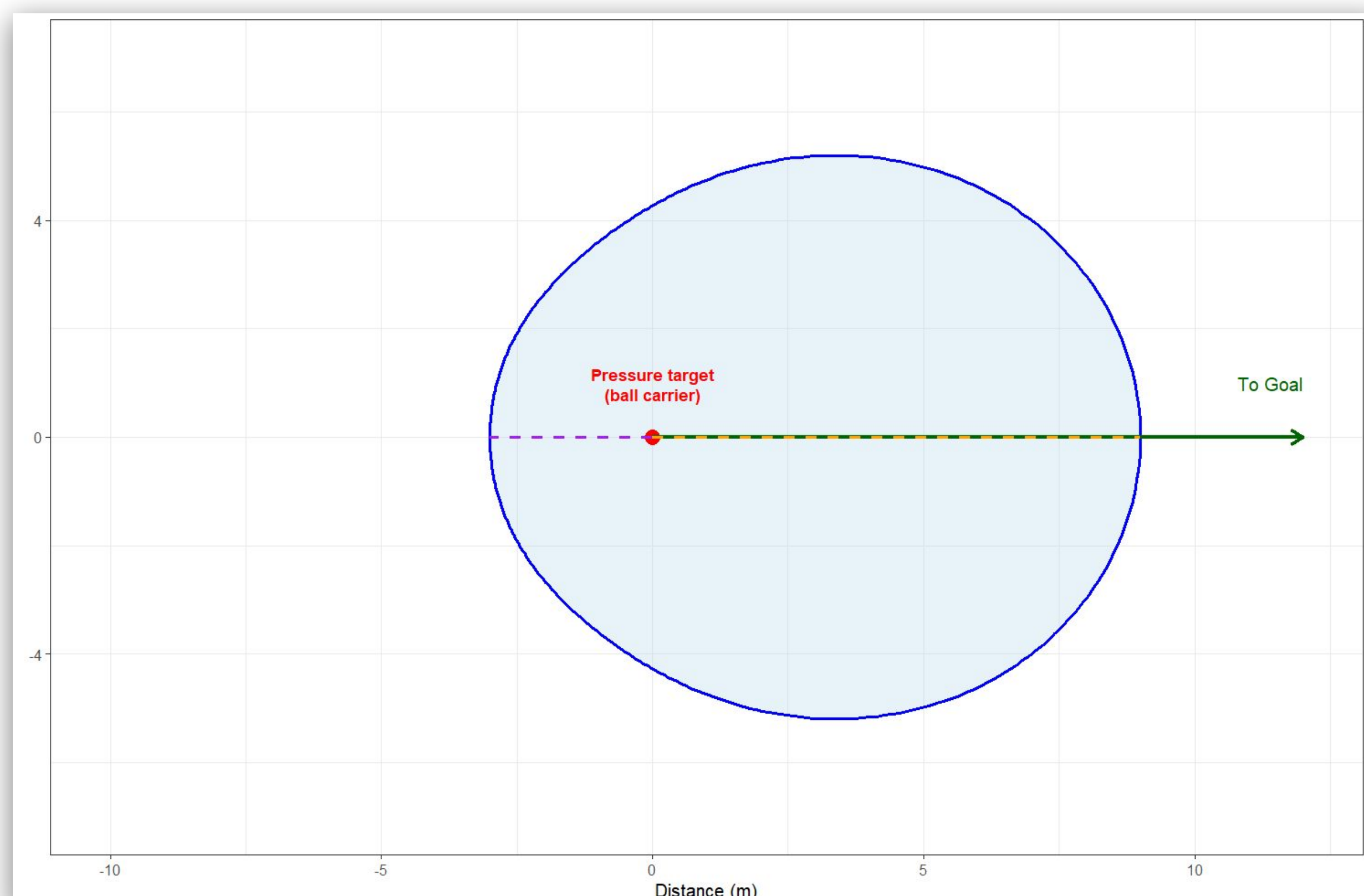
Data

Official data from SkillCorner.
Dataset: 521 matches in the MLS 2023 season each with match information, dynamic events and tracking data.

The Pressure Zone

Our initial "pressure zone" idea

The "pressure zone" adopted from Andrienko et al., 2017

Methodology

Pressing Criteria:

A defending player was classified as "pressing" if they were simultaneously within the oval pressure zone and approaching the ball carrier above the velocity threshold of 1 m/s to filter out "static" defending/pressing.

Feature Engineering:

31 features were extracted which include:

- Spatial Context: Ball carrier position, distance to boundaries, field third, etc.
- Pressing Dynamics: Number of defenders, approach velocity, passing options, etc.
- Game Context: Score, game state (winning/losing/drawing), time remaining, etc.
- Situational Factors: How the ball carrier gained possession (pass reception, interception, etc.), incoming pass characteristics (distance, height, range), etc.
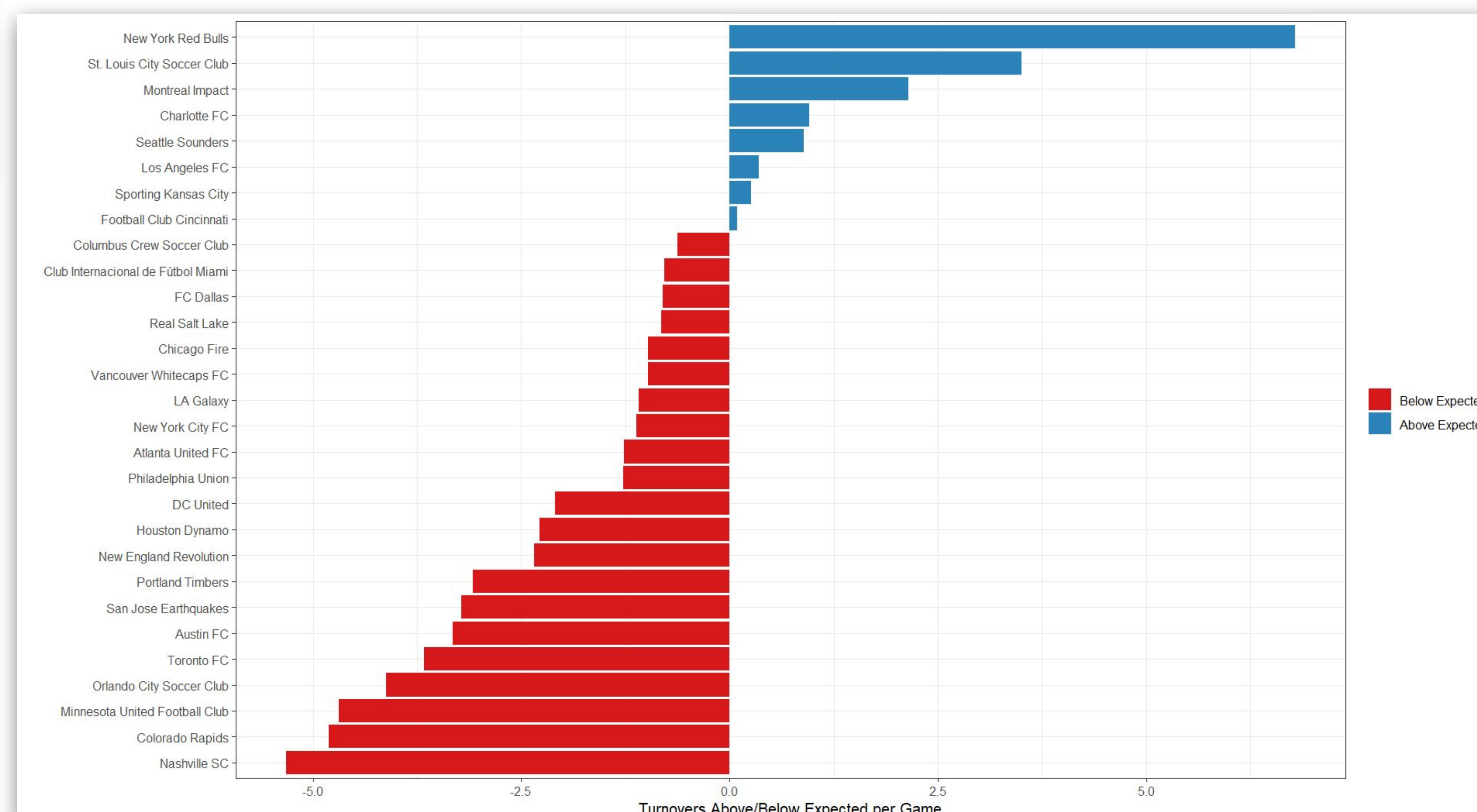
Modeling Strategies:

1. Logistic Regression
2. XGBoost

…with **10-fold cross-validation.**

Model Performance Summary

Model	AUC	Accuracy	Log Loss
Logistic Regression	0.764	82.2%	0.445
XGBoost	0.771	82.3%	0.442

XGBoost marginally outperformed logistic regression

Results

Blue shows teams forcing more turnovers than predicted, *Red* shows underperformance. New York Red Bulls led MLS in pressing effectiveness, while Nashville SC struggled most relative to expectations.

Results
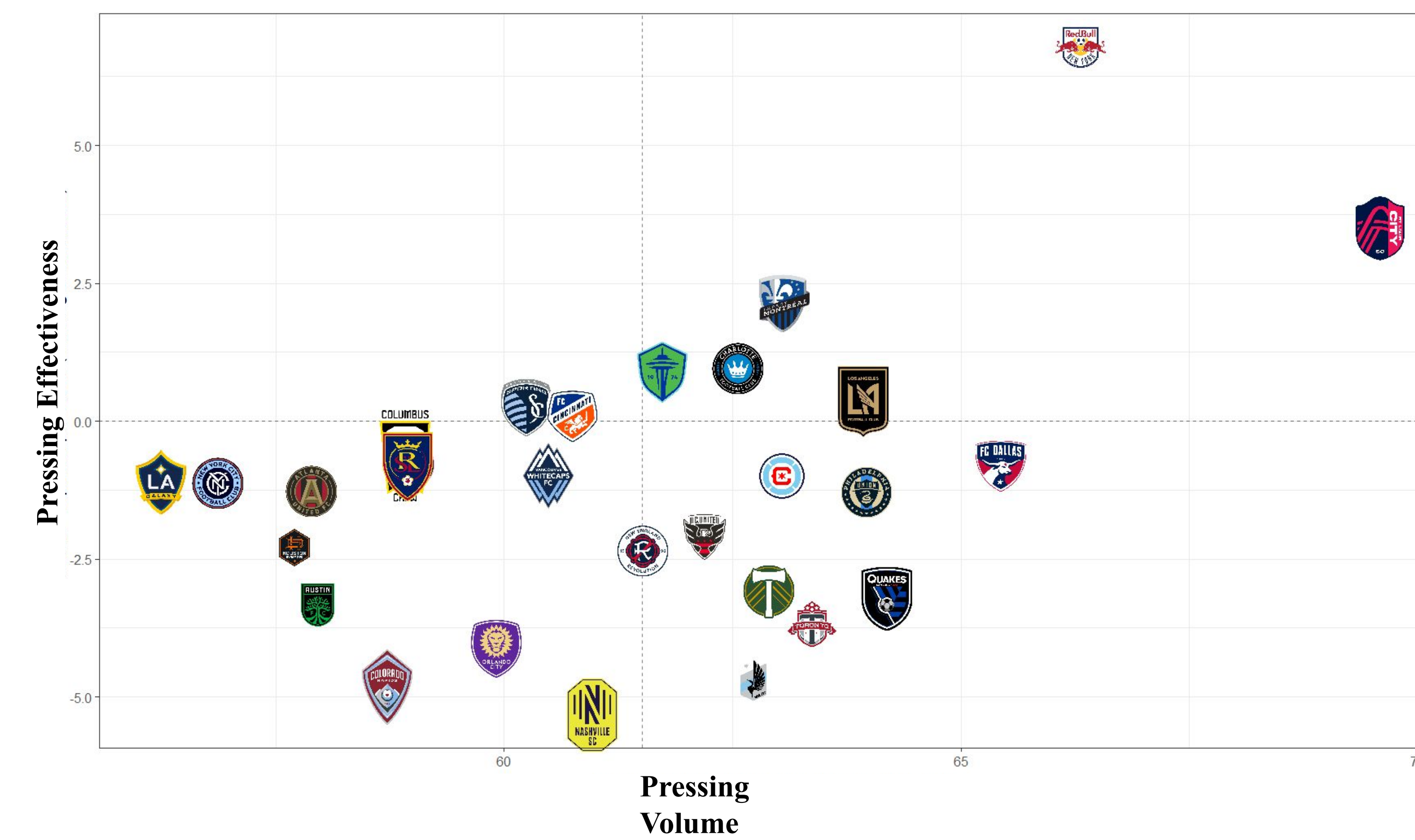
Teams in the upper-right quadrant combine high pressing frequency with high effectiveness

Conclusion

With soccer being a continuous sport, our analysis provides some important information about pressing effectiveness. The feature `start_type` contributed approximately 70% of total model importance. This feature describes how the ball carrier got in possession of the ball, which could be an interception, reception, recovery, among others.

Limitations:

- Potential inaccuracies in SkillCorner tracking data may affect the precision of player positions and movements.
- The model does not incorporate individual player skill levels or tactical tendencies
- Pitch control—how players influence space on the field—is not explicitly modeled, which may limit the understanding of spatial dominance during pressing events

Future Work:

Incorporate pressing intensity calculations and pitch control

Acknowledgement