

Definition



- ◆ Quickness = Speed --> Defined as $\text{Speed} = \text{Distance} / \text{Time}$
- ◆ There are 2 types of speed that we are interested in: Onball and offball

Onball: When player has possession of the ball

Offball: When possession of ball is with another player (other than the player we are interested in)

- ◆ For each of these speed (i.e. onball/offball/overall speed), we will also take into consideration whether the player's team was in possession.
 - E.g. if team is in possession:
 - speed_teampos_onball: Onball speed while team was in possession
 - speed_teampos_offball: Offball speed while team was in possession



General Approach

1. Measure the distance moved from frame to frame at a frame rate of n ([code](#)).

a. Measuring the distance moved by the player as the frame moves.

This is done by comparing the (x, y) coordinates between 2 frames, i.e. frame vs frame + n . For the analysis, I chose $n=1$.

b. Measure the time past. Time past = $n * 0.10$ seconds

2. Next, we split this movement into onball and offball movement.

3. We further drill down into whether the onball/offball movement when in tandem with moments when the team was on/off possession.

Important Assumptions To Note:

1. Intent of the player is not captured. For e.g., when you are defending, you have less motivation to run at top speed since you may be adopting tactical defending.
2. There are moments that may not be captured in the data, but it doesn't mean the player wasn't moving.
3. Distance moved may be subjective to frame rate smoothing.

Overall

Speed

Onball speed

Offball speed

Team In Possession

Onball speed

Offball speed

Team Off Possession

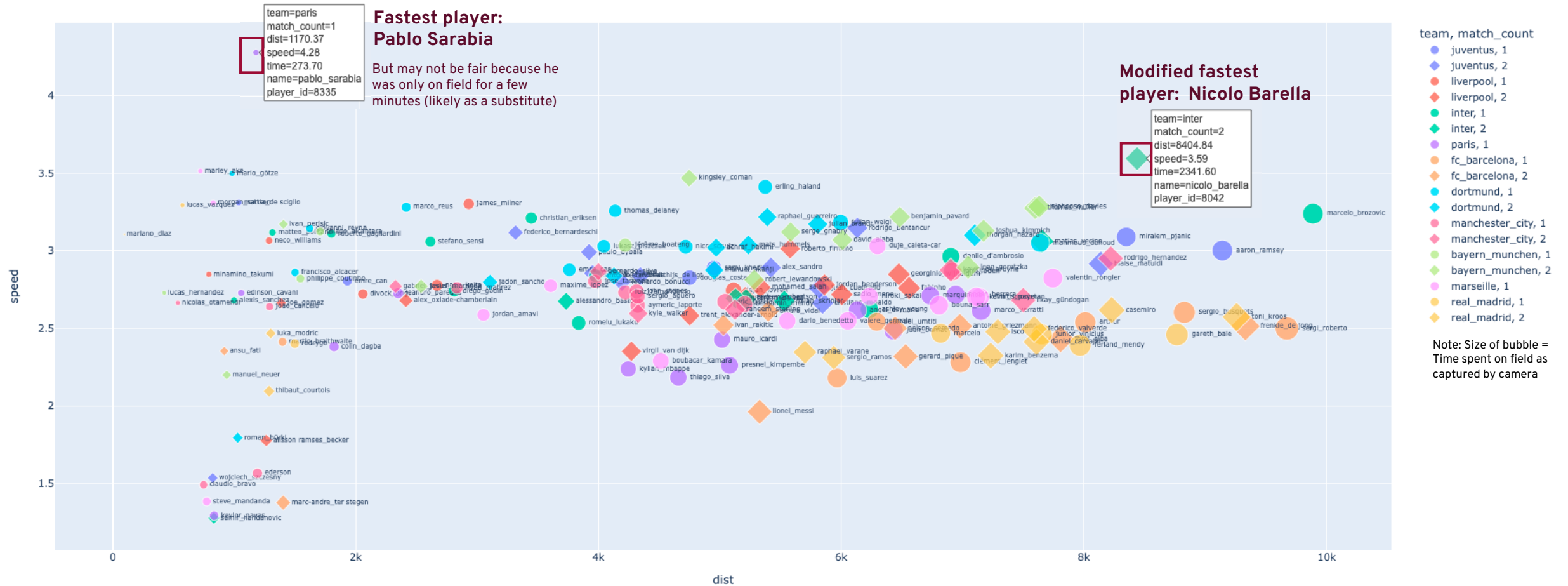
Offball speed



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Overall Speed

speed (y-axis) vs dist (x-axis)



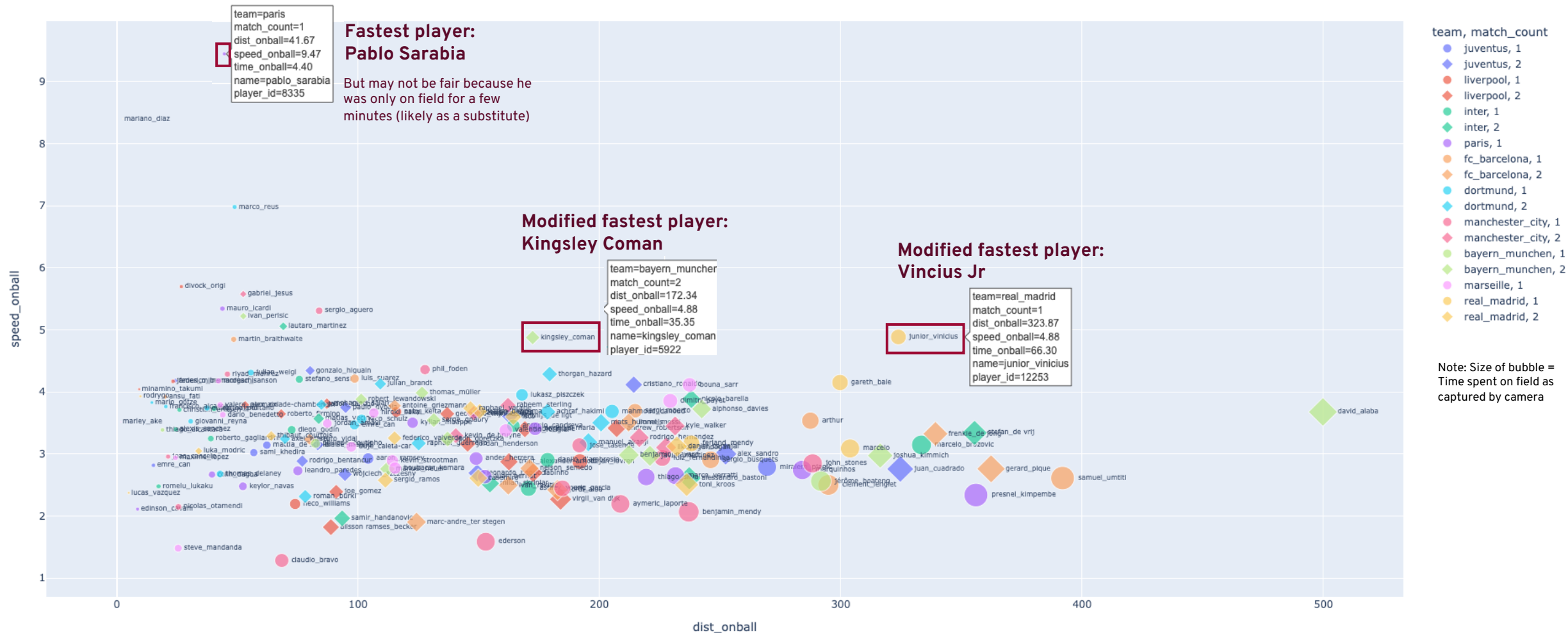


Onball Speed



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speed_onball (y-axis) vs dist_onball (x-axis)



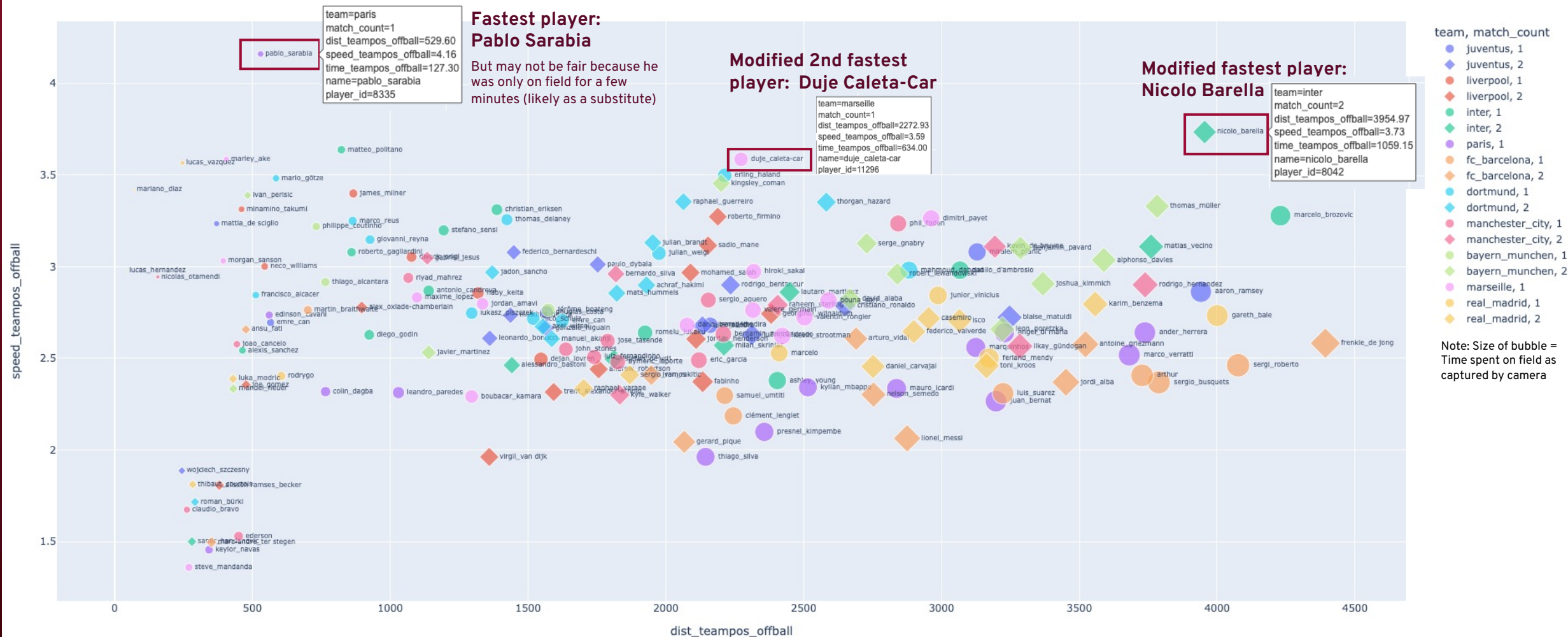


Offball Speed While Team In Possession



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speed_teampos_offball (y-axis) vs dist_teampos_offball (x-axis)



Things To Do Differently



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Refine Possession Definition

Possession is currently defined based on the tracking data provided by SkillsCorner.

We can validate whether this is accurate by measuring the distance between the ball and the surrounding closest players.



Combining Real-Time Match Stats

As the match is taking place, real-time stats are being recorded.

Stats like current score, possession, player's position all have an impact on the player's distance ran and speed.

Therefore, we can combine these real-time stats to potentially improve our measurement.



More Match Data For Validation

If there's more data, we will have a stronger statistical approach to the measurement of distance.

Currently, with only 2 matches max per player, it can skew the speed of each player.

For instance, we can see that those players who had lesser minutes tend to be "faster".



Validating Movement Data

For now, we are assuming that the data provided by SkillsCorner is accurate. However, that may not be the case.

If we want to use the data at production level, it is best to backtest the data.

For e.g., we can select a couple of matches and key moments in the matches. Then we compare the position of the players we see on screen with the positions provided by SkillsCorner. It will not match 100%, but this will be indicative of whether the coordinate data is close to being accurate.