Definition

- Quickness = Speed --> Defined as Speed = Distance / 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.

Overall

- Speed
- Onball speed
- Offball speed

Team In Possession

- Onball speed
- Offball speed

Team Off Possession

- Offball speed

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.

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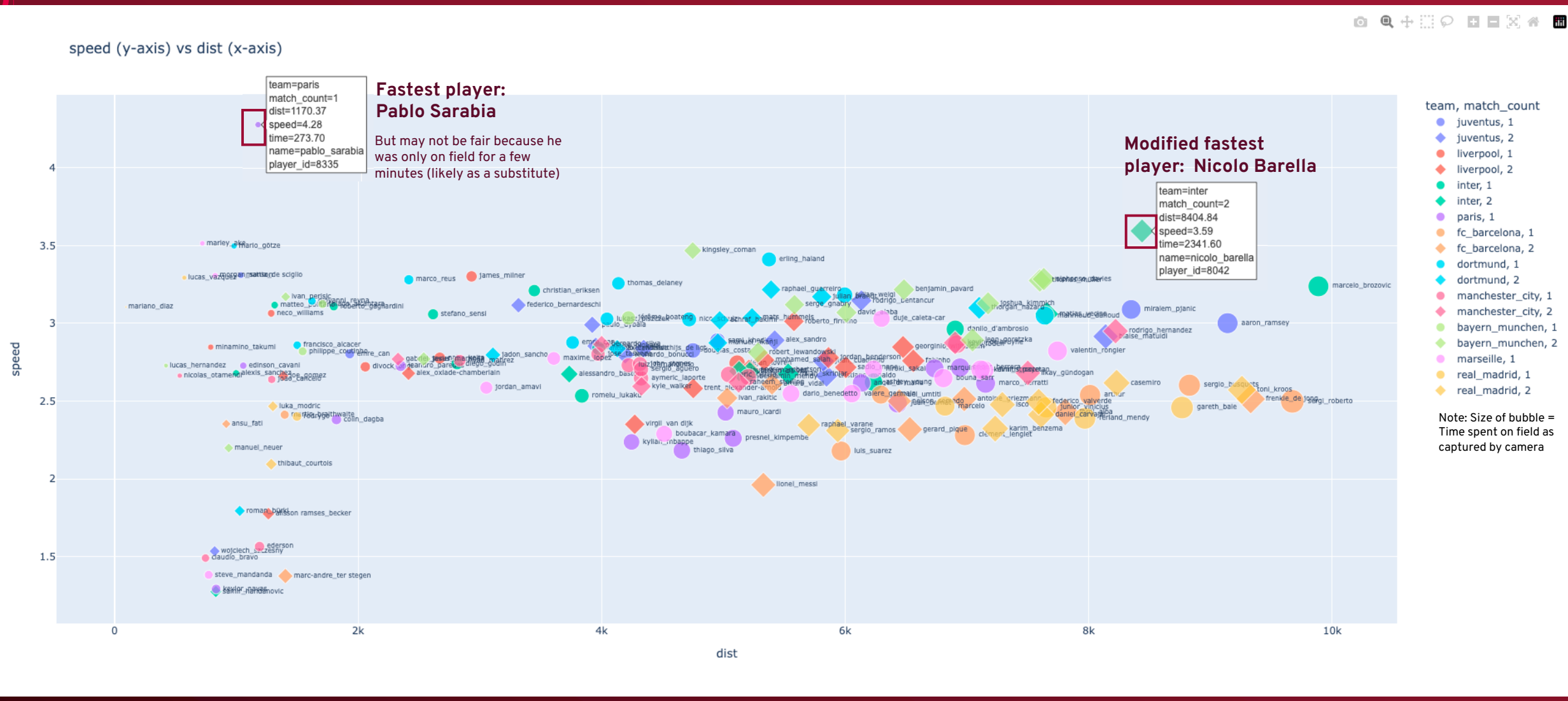
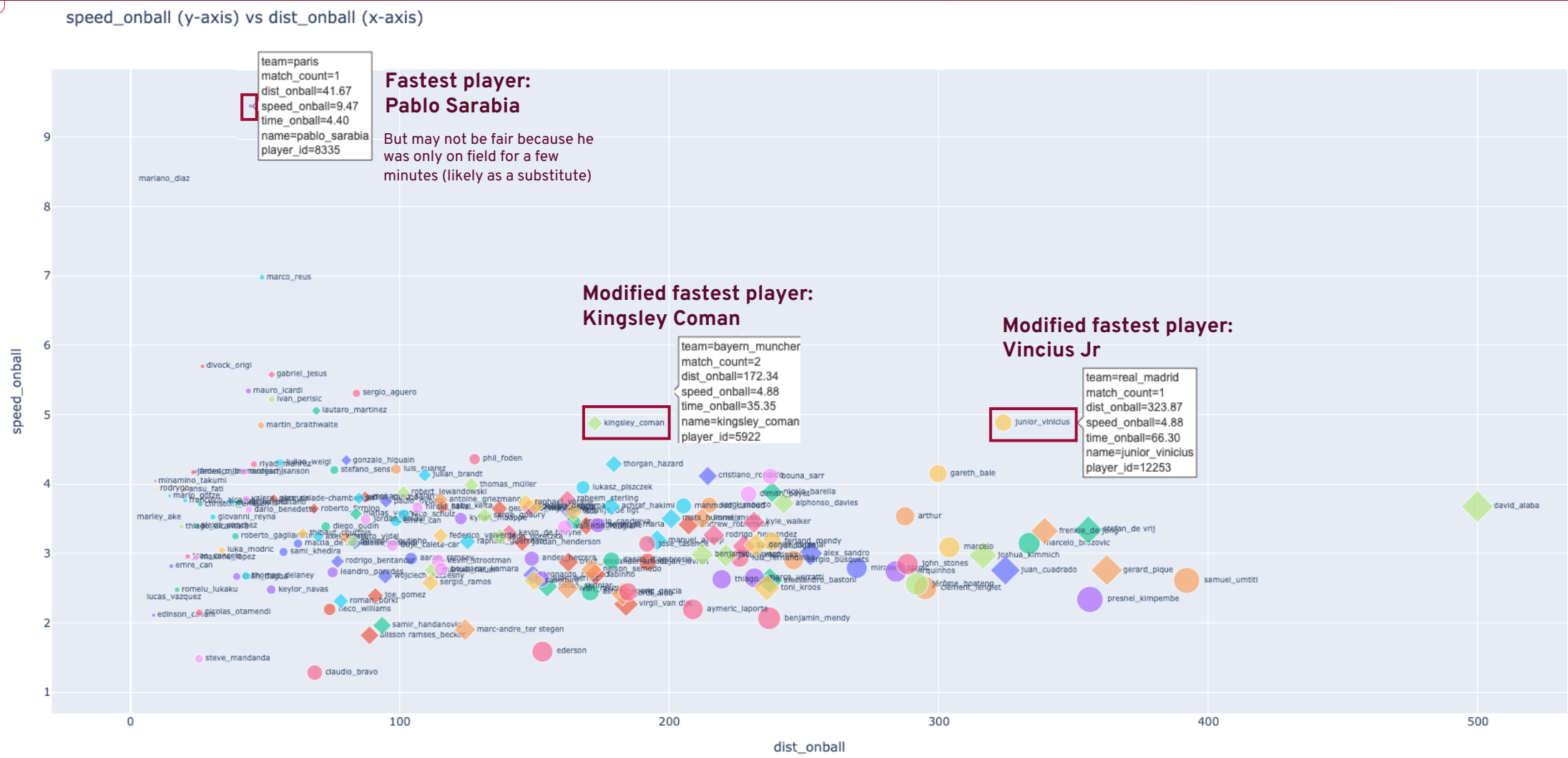
Overall Speed



The Plotly charts for the analysis can be found here.

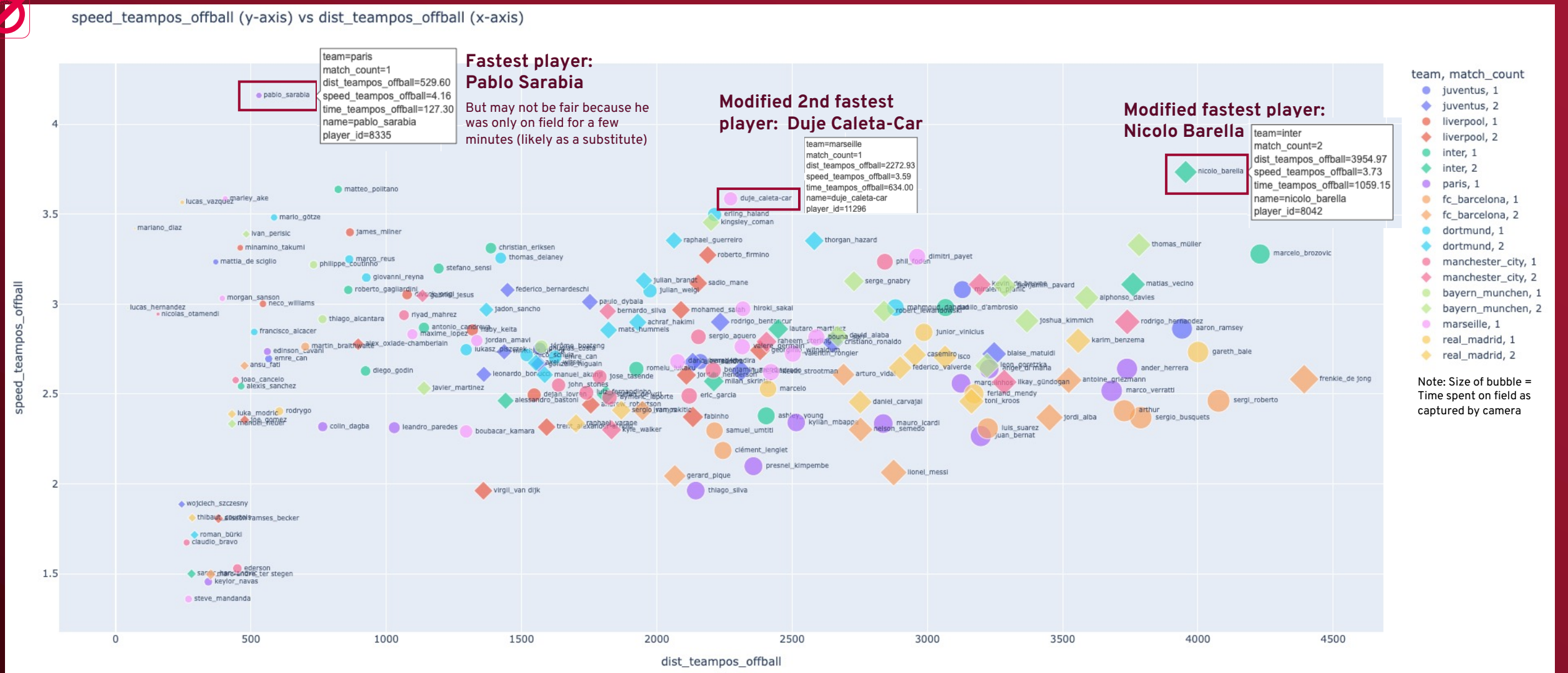
Onball Speed



Note: Size of bubble = Time spent on field as captured by camera

The Plotly charts for the analysis can be found here.

Offball Speed While Team In Possession



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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.

Movement Relative To Pitch

The pitch can be split into 3 thirds: Attacking, defensive, and middle third.

We can further analyze players' movement in:

1. Each of the 3 thirds
2. Movement across the 3 thirds

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".

In addition, we can also combine this data with highlights. This will help us to better identify key action frames within the match.

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.