

## **Final Project:**

### **Introduction**

In this final project, I build on the foundations and insights developed in the previous groupworks to further analyse Cagliari Calcio's performance during the 2021/22 Serie A season. The objective is not only to describe the team's poor results, but to better understand the underlying reasons behind them and identify areas where performance could be improved.

The analysis is structured in two main parts. First, a season-level analysis is conducted to assess Cagliari's overall attacking and defensive performance in comparison to the rest of the league. This step helps highlight the main team-level weaknesses that may explain the team's struggles throughout the season. Second, the focus shifts to a more detailed game and player-level analysis, with particular attention given to the final matches of the league, when Cagliari was fighting to avoid relegation.

Given the strong link between ball progression and chance creation, special attention is paid to passing behaviour and the team's ability to bypass opponents. League-wide comparisons are used to place Cagliari's numbers into context, while spatial, player, and match-level analyses help reveal recurring patterns rather than isolated events.

### **Results**

#### **Season level analysis:**

Given the restricted length of this project, the first step is to examine Cagliari's season-level attacking and defensive KPIs to identify the most critical performance areas. **Error! Reference source not found.** displays selected metrics per 90 minutes, providing an overview of the team's output on both ends of the pitch<sup>1</sup>. As expected from a team that was eventually relegated, Cagliari performed comparatively poorly in most categories.

Defensively, however, the picture is slightly less dramatic: the team does not appear among the bottom five in allowed offensive touches, allowed successful passes into the final third, or opponents bypassed by dribbles. Offensively, the situation is more concerning. Cagliari records the lowest number of bypassed opponents by passes and bypassed defenders and ranks among the bottom three teams in most of the other metrics considered.

Given these observations, the remainder of this report focuses on Cagliari's attacking process, and in particular on their passing and progression, as this seems to be the area where the team is most clearly underperforming and is essential for creating scoring opportunities.

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<sup>1</sup> This is very similar to what I did in Groupwork 2, where, for both own and allowed actions, I computed the correlation between selected metrics and xG and reported Cagliari's ranking regarding each metric. I am also including passes in the final third metric (SPFT), which was the focus of Groupwork 2 and 3.

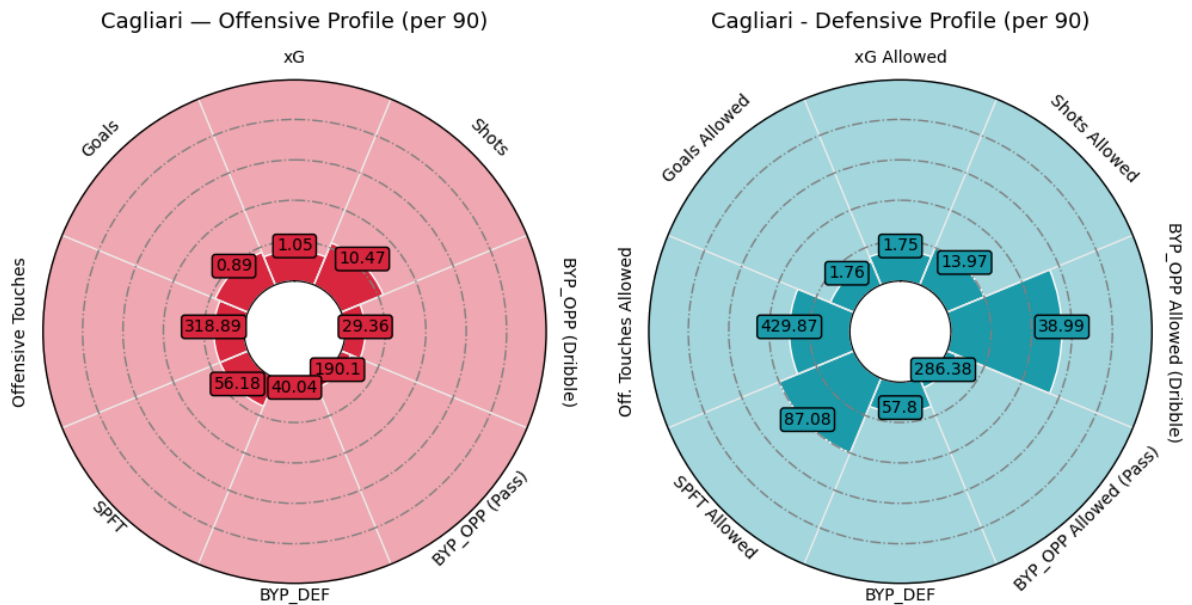


Figure 1: Cagliari's offensive and defensive season metrics per 90 minutes. Marker labels show metric values. Bar lengths indicate league ranking. For offensive metrics, the longest bar corresponds to the highest value; for defensive metrics, it corresponds to the lowest value allowed. SPFT corresponds to successful passes received by a player located in the final third (inc. opponent box). BYP\_OPP and BYP\_DEF correspond to bypassed opponents and defenders, respectively.

An immediate question concerns Cagliari's inability to progress through passing. The left panel of Figure 2 illustrates the strong correlation across the league between bypassed opponents and xG. The right panel shows the relationship between successful passes and bypassed opponents by passes, where two main conclusions stand out. First, Cagliari is the team furthest below the trendline, producing fewer bypassed opponents per successful pass than any other team (0.50 per pass). This suggests that the team is not successfully progressing on the pitch by associative play, making harmless passes or being unable to find better positioned team-mates. Second, the team is still in the bottom three regarding successful passes overall, so the problem is not just pass' quality but also quantity.

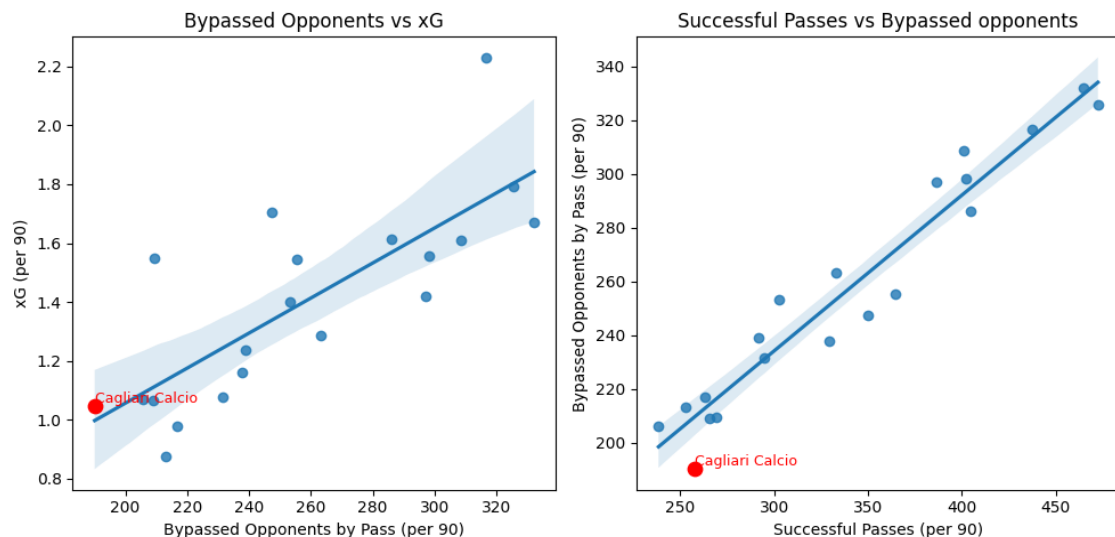


Figure 2: Relation between xG, bypassed opponents and successful passes. Each point corresponds to a team in the league.

Further evidence of progression issues comes from how rarely Cagliari finds players between the lines. The team averages 52.7 line-breaking receptions per 90, compared to a league mean of 78.3 and a median of 73.7—by far the lowest in Serie A, as shown in Figure 3. Furthermore, as shown in Table 1: Availability between lines by position where player receives, Cagliari vs bottom half of the league., this inability to find team-mates between lines is more prevalent in the middle and final third, as compared with the other nine teams in the bottom half of the league, to provide a more realistic baseline that does not include the best teams of the league.

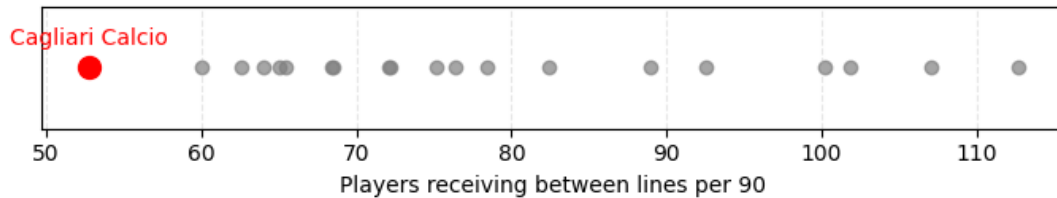


Figure 3: Average number of players receiving between lines per 90 minutes, per team. Each point corresponds to a team in the league.

Start Pitch Position	Cagliari	Bottom Half (exc. Cagliari)
First Third	8.4	10.4
Middle Third	29.6	39.3
Final Third	13.9	18.9

Table 1: Availability between lines by position where player receives, Cagliari vs bottom half of the league.

To understand why Cagliari struggles to access these advanced spaces, we examine the types of passes the team attempts. Figure 4, for each team, the frequency and accuracy of low and chipped passes. Cagliari is the second team relying more on chipped passes, and the second least reliant on low passes. Additionally, chipped passes display a negative relationship between frequency and accuracy, while low passes show the opposite trend. This suggests that teams attempting more chipped passes (such as Cagliari) generally adopt higher-risk styles without necessarily generating more value.

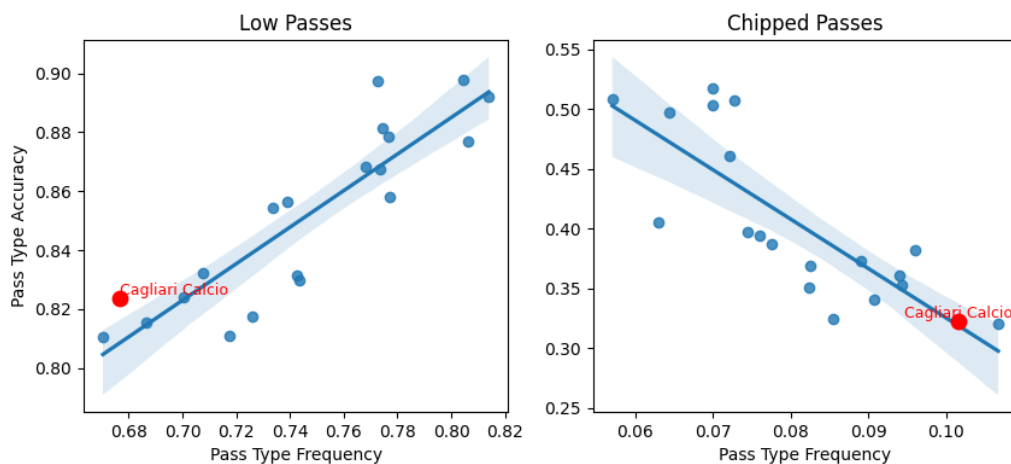


Figure 4: Frequency vs accuracy of low and chipped passes, by team. Frequency corresponds to the share of total passes corresponding to the pass type. Accuracy is the fraction of successful passes.

A possible explanation is that Cagliari might be forced to play chipped passes under heavy pressure. However, Figure 5 shows the average pressure faced when attempting a chipped pass: Cagliari actually receives the third-lowest pressure in the league (18.1%, versus a league average of 19.7%). This suggests that the high frequency of chipped passes reflects tactical choices, player tendencies or the inability to find a more advanced team-mate, rather than pressure-induced emergency play.

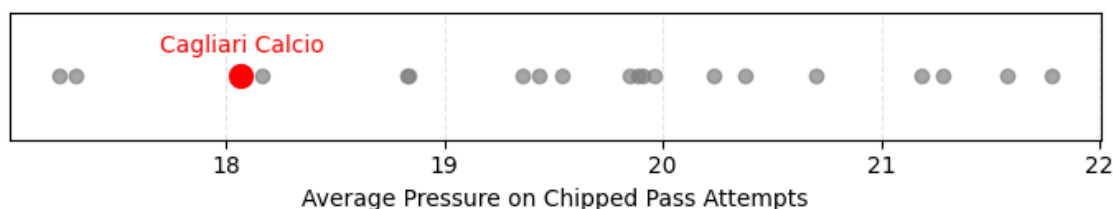


Figure 5: Average pressure received when attempting a chipped pass, by team.

Taken together, the high reliance on chipped passes and their limited accuracy suggests a style of progression that prioritizes direct, high-variance actions over sustained positional circulation. This may help explain both Cagliari's low number of receptions between lines and their difficulty in consistently bypassing opponents through passing combinations.

### Fixture and player level analysis:

Given the team-level evidence of limited positional progression and an overreliance on direct passes, the next step is to examine which players are most involved in bypassing opponents, either as passers or receivers, and how this responsibility is distributed across the team.

In order to produce a more detailed player- and fixture-level analysis, I focus on a subset of games. I put myself in the context of the remaining five games of the league season. Cagliari finds itself 17th in the standings, in need of points to avoid relegation. In these final fixtures, the team has to

face three other teams directly involved in the relegation battle<sup>2</sup>. Given this context, the objective is to identify key insights that could potentially help the team obtain crucial results to remain in Serie A.

Match Day	Fixture
34	Genoa (A)
35	Hellas Verona (H)
36	Salernitana (A)
37	Inter (H)
38	Venezia (A)

*Table 2: Last five games of the league season for Cagliari.*

To prepare for these games, a useful starting point is to examine which players have been most relevant at bypassing opponents, either by giving or by receiving passes. To do so, I focus on the five games preceding matchday 34, in order to obtain a more representative picture of the team's recent performance.

From Table 3, we can observe the importance of central defenders in bypassing opponents through passes<sup>3</sup>. This is partly expected given their high involvement in build-up, but it also highlights how much responsibility for progression falls on the back line. Table 4 complements this view by showing the relevance of centre forwards as receivers. This is particularly striking considering that Cagliari usually plays with two centre forwards, yet three different forwards appear in the top five. Even when accounting for differences in minutes played, this suggests that progression often relies on direct passes into the forward line rather than through midfield combinations. Both tables once again point towards the midfield area as a potential weakness in the team's overall passing structure.

Player	Position	# Passes	Bypassed Opponents by Passes	Bypassed Opponents per Pass
Giorgio Altare	Central Defender	193	112.8	0.6
Edoardo Goldaniga	Central Defender	138	105.9	0.8
Matteo Lovato	Central Defender	152	78.9	0.5
Alessio Cragno	Goalkeeper	75	78.3	1.0
Alberto Grassi	Defensive Midfield	163	68.3	0.4

*Table 3: Top players bypassing opponents by passes.*

<sup>2</sup> In reality, Cagliari just won two points from this sequence of games, drawing against Venezia and Salernitana, who avoided relegation with just one more point than Cagliari.

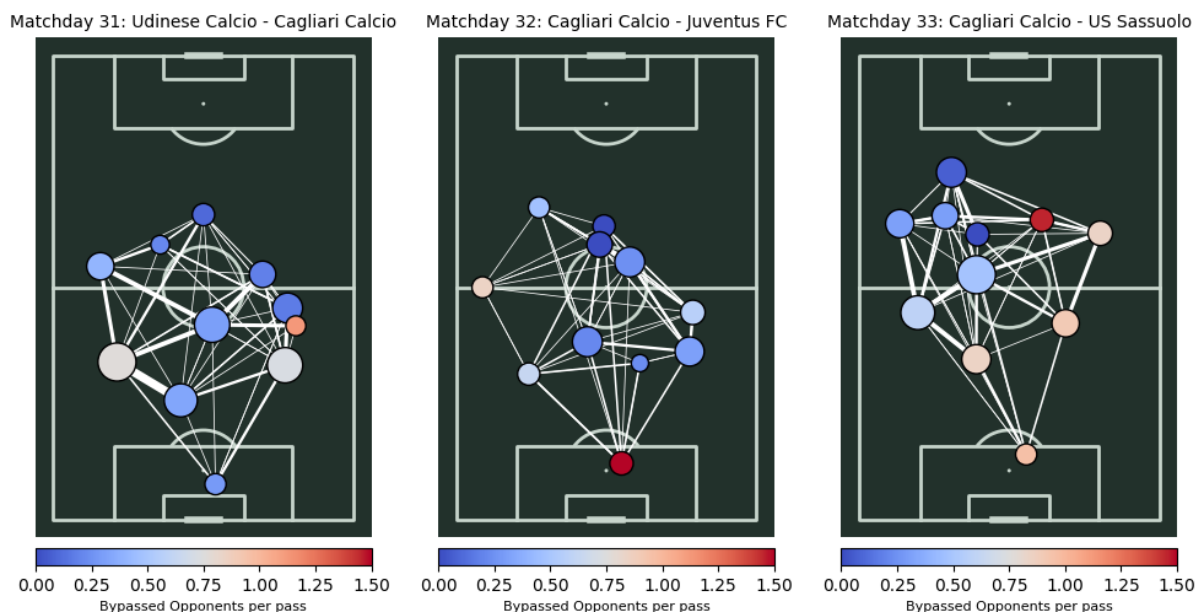
<sup>3</sup> A similar analysis was done for Groupwork 1, but here we are looking at the team's players, instead of players of a selected opponent.

Player	Position	# Passes	Bypassed Opponents by Passes	Bypassed Opponents per Pass
Leonardo Pavoletti	Center Forward	60	132.4	2.2
João Pedro	Center Forward	75	130.5	1.7
Răzvan Marin	Center Midfield	80	73.6	0.9
Keita Baldé	Center Forward	48	71.8	1.5
Dalbert	Left Wingback	70	62.1	0.9

*Table 4: Top players bypassing opponents by receiving passes.*

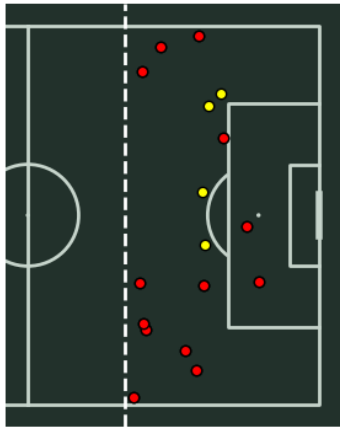
To examine the team's passing system in more detail, we can plot a passing network that shows the number of passes between players in a spatial context. Figure 6 displays Cagliari's passing network during the first halves of the three previous matches. The first-half filter is applied to reduce the impact of substitutions and to better capture the team's baseline structure, as later phases of matches are often heavily influenced by the scoreline.

An additional advantage of focusing on these three matches is that they represent different outcomes. Cagliari were defeated 5–1 and 1–2 in matchdays 31 and 32, respectively, but managed a 1–0 win against US Sassuolo in matchday 33. From Figure 6, we can first observe a more advanced average positioning against US Sassuolo compared to the two previous matches. Moreover, the distribution of passes appears more balanced, with less reliance on a small number of players than against Udinese, and a more compact structure than against Juventus. Finally, bypassed opponents per pass are generally higher across most positions, and this relates as well with the highest amount of successful passes in the final third, as shown by Figure 7.

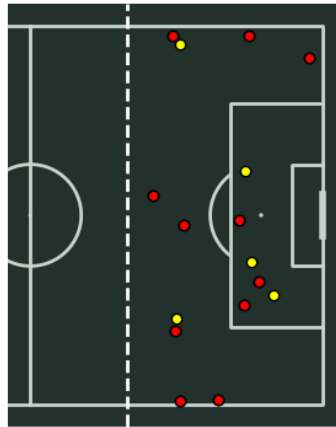


*Figure 6: Cagliari's passing network for selected games. Each node corresponds to a player, positioned at the average location of their pass attempts (as was done in Groupwork 3). Node colour represents the average number of bypassed opponents per pass attempted, while the width and opacity of the lines indicate the number of passes exchanged between players. Only first-half passes are considered.*

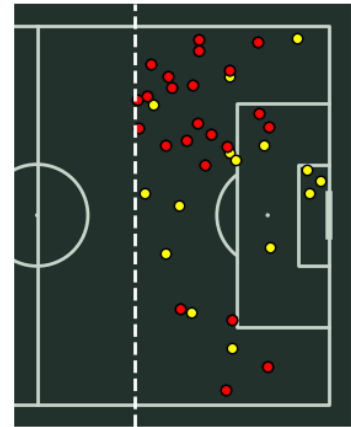
Matchday 31: Udinese Calcio - Cagliari Calcio



Matchday 32: Cagliari Calcio - Juventus FC



Matchday 33: Cagliari Calcio - US Sassuolo



*Figure 7: Cagliari's successful passes in the final third for selected games. Red dots marked low passes, while all other types of passes are in yellow. Location corresponds to the coordinates where passes were received.<sup>4</sup>*

## Conclusions and future work

The analysis suggests that Cagliari's attacking problems are mainly linked to how the team progresses the ball, rather than to isolated execution errors. Compared to the rest of the league, Cagliari consistently ranks poorly in progression-related metrics such as bypassed opponents by passes, receptions between lines, and entries into advanced areas. This helps explain the team's low xG output and overall lack of attacking threat.

A key finding is Cagliari's high reliance on chipped passes and relatively low use of low passes. This tendency does not appear to be driven by higher defensive pressure, suggesting it is more likely a tactical choice or related to player profiles. While chipped passes can occasionally bypass several opponents, they seem to limit sustained possession and reduce midfield involvement. Player-level and passing network analyses support this view, showing that progression often comes from central defenders or direct balls into forwards, with midfielders playing a more limited role after receiving the ball.

Future work could explore pass sequences in more detail, linking different types of progression to shots or high-quality chances. Further player-level analysis and, ideally, tracking data would also help better understand space, pressure, and passing options available to the team.

<sup>4</sup> Groupwork 3 already included visualization of successful passes in the final third in a selected game. The only difference here is highlighting low passes, due to previous discussion in this report.