



Deciphering the **Liverpool** Attack

A submission for the Friends of Tracking Liverpool Analytics Challenge

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Objective

Present an analytics-driven opposition analysis of Liverpool's goals primarily using data from Last Row (**19 goals**).

This presentation has been prepared in a style which can be communicated to coaching staff/analysts of an opposition team about to play Liverpool.

The Basics

Liverpool Starting-11 2019/2020 (by min. played)



1. Alisson
Apps: 28
Min: 2485



4. Van Dijk
Apps: 41
Min: 3780



26. Robertson
Apps: 41
Min: 3574



12. Gomez
Apps: 34
Min: 2567



3. Fabinho
Apps: 31
Min: 2295



66. Alexander-Arnold
Apps: 40
Min: 3365



5. Wilnajdum
Apps: 38
Min: 3028



10. Mane
Apps: 38
Min: 3049



9. Firmino
Apps: 43
Min: 3339



14. Henderson
Apps: 35
Min: 2814



11. Salah
Apps: 40
Min: 3423

The Basics

Goals, goals, goals...

Stat Leaders

Source: Transfermarkt

Goals					
2019/20		2018/19			
1.		20	1.		27
2.		18	2.		26
3.		11	3.		16
4.		7	4.		7
5.		5	5.		7

Assists					
2019/20		2018/19			
1.		14	1.		16
2.		12	2.		13
3.		12	3.		12
4.		9	4.		8
5.		7	5.		7

The Basics

Goals, goals, goals...

All competitions	2019/20	2018/19
Total games played	48	53
Total goals scored	98	115
% scored by forwards	$55/98 = 56.1\%$	$86/115 = 74.7\%$
Total assists given	82	84
% assisted by forwards	$37/82 = 45\%$	$33/84 = 39.2\%$
% assisted by full-backs	$24/82 = 29.2\%$	$29/84 = 34.5\%$

Source: Transfermarkt

Deadly Front 3 – Liverpool's goal scorers are very top-heavy and are more or less dominated by the 'big three' of Salah Mane and Firmino. Much of this can be attributed to the amount of chemistry between the forwards (all three have played > 3000 min this season).

Attacking full-backs – As we already expected, a big facet of Liverpool's game plan relies on their bombarding full-back duo, who have assisted on average over 30% of Liverpool's goals across the 2 seasons.

The Basics

Some other takeaways

Watch the wings – Goal stats alone suggest Firmino plays more of a support striker role behind Mane and Salah despite being positioned centrally. Would also show that the front 3 are all equally capable of playing across the front line and being a threat from any side.

Midfield guard – Only midfielders to feature in any of the G/A top 5 are James Milner (note however that 8 of his 11 goals from the last 2 seasons have come from penalties) and Alex Oxlade-Chamberlain who hasn't been much of a starter since returning from long term injury.

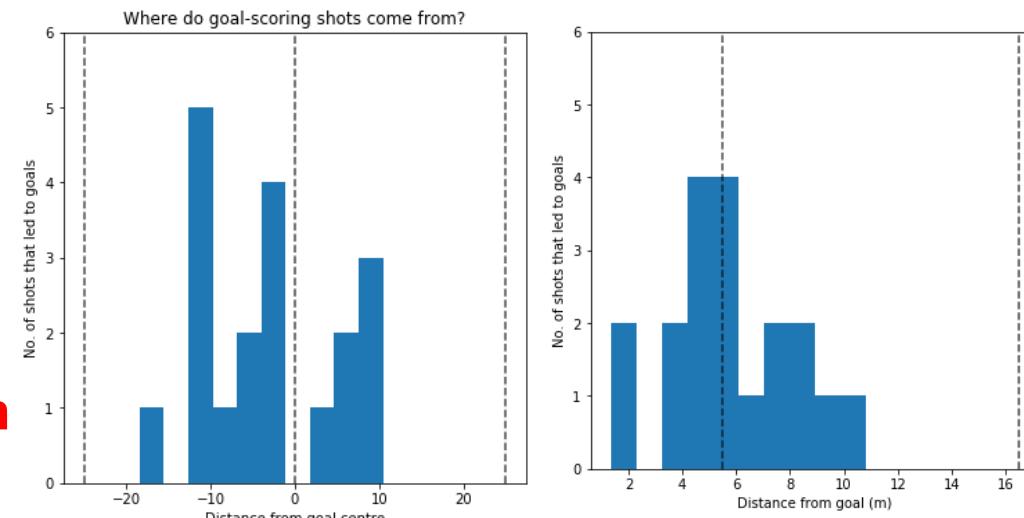
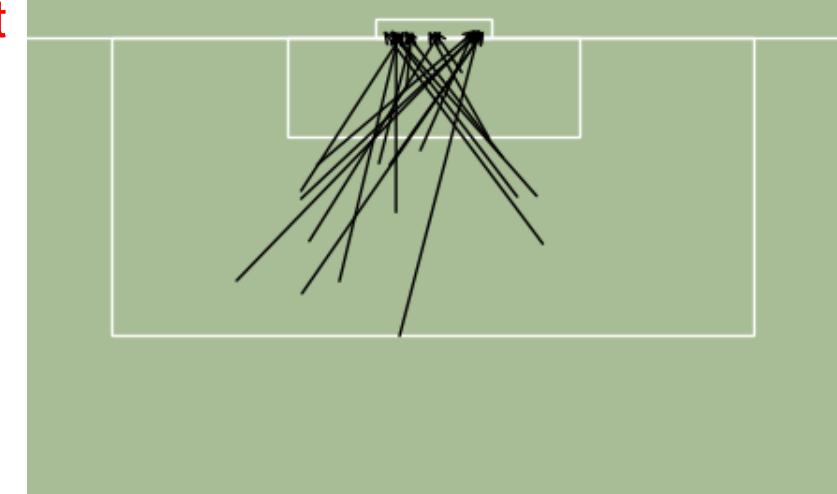
Improved teamplay – They've nearly matched their assist count from 18/19 with almost 20 fewer goals scored. This may hint that they are scoring a greater percentage of goals through deliberated crafted chances through team play as opposed to individual brilliance/defensive errors/luck. The goals have been more well spread out this current season with all their forwards accounting for "only" 56.1% of Liverpool's goals compared to 74.7% last season.

Analytics

Shot analysis

Shot map and histograms of the 19 goals from the Last Row dataset

- Fairly even spread of goals scored within the penalty area before and after the 6-yard box. Assuming this to be roughly representative of Liverpool's goals, they have no problem penetrating into the penalty box to shoot → **high quality chance creation.**
- Note the shot directions/ end-locations for these goals. Only 3/19 are directly at the goal centre → **high quality finishers.**
- Interestingly none of the shots from the right side (facing the goal) were hit near post → **possible hint at the left forward's (Salah) preference for far post finishes with his left.**

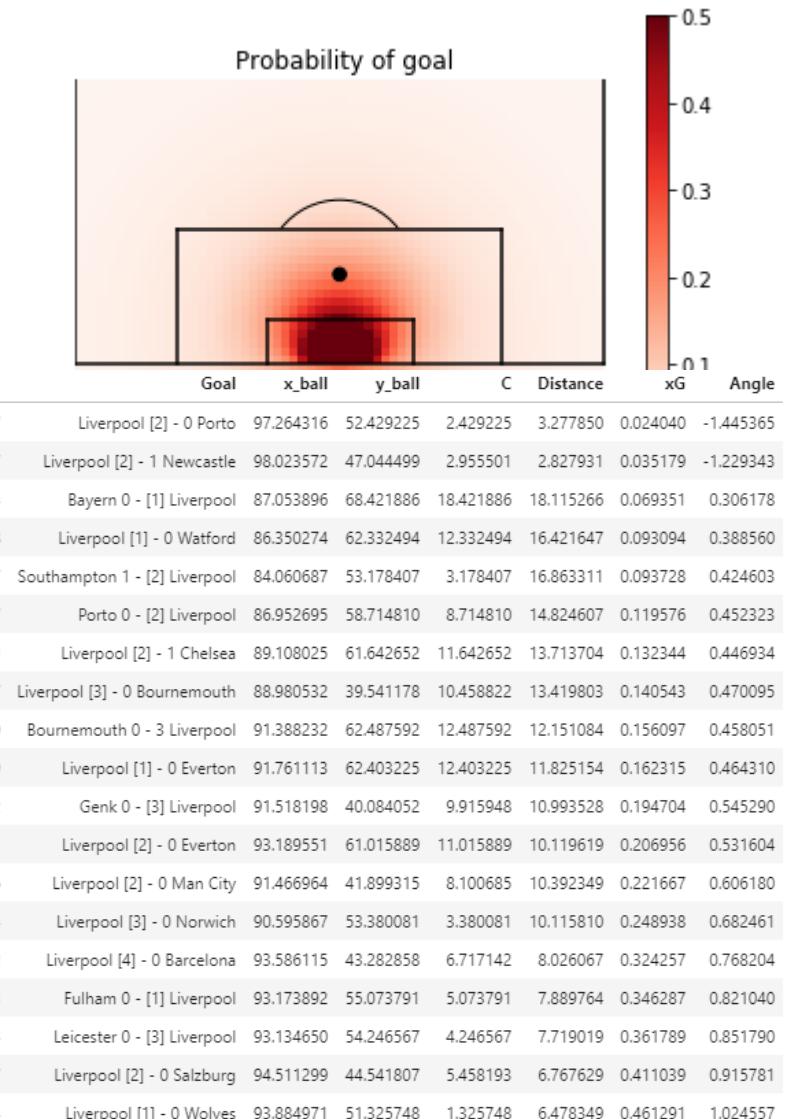
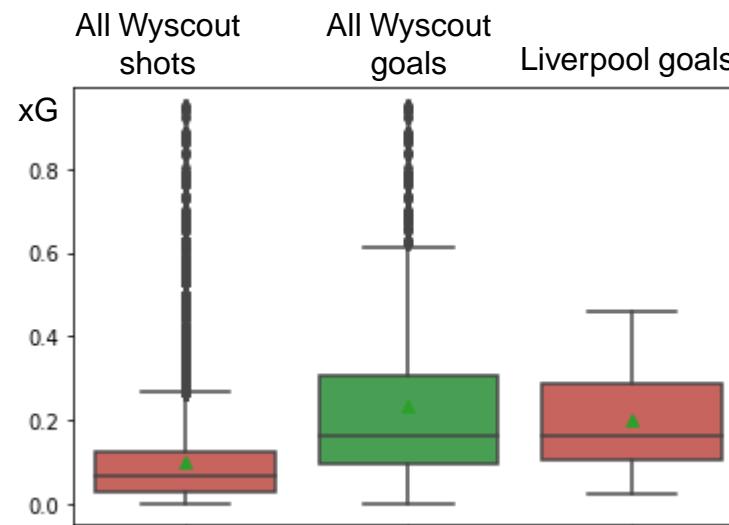


Analytics

Shot analysis

Benchmarking chance quality creation with xG

- Using a xG model (built using data from WyScout) taught in one of the Friends of Tracking tutorials, we benchmark the xG of the 19 goals scored against the (min,max) bounds of the model to analyse the probability of each chance being created (and finished).
- Liverpool's 19 goals were together of higher than the average shot, of slightly less xG than the goals used to make the model.
- Good chances, better finishing



Analytics

Shot analysis

Benchmarking finishing ability with wider xG data

2019/20 PL	xG	Goals
Total	61.03	66
Open play	50.7	50
Corners	6.87	8
Set pieces	1.69	3
Direct FKS	0.83	0

The screenshot shows a dark-themed dashboard for the EPL 2019/2020 season. At the top, it says "EPL" and "2019/2020". Below that is a navigation bar with tabs for "Table", "Charts", and "overall", along with filters for "home", "away", "Start date", "End date", and a search bar. The main area is a table with the following columns: No, Team, M, W, D, L, G, GA, PTS, xG, xGA, xPTS. The table lists 20 teams from 1 to 20, including Manchester City at the top with 64.29 xG and 54.52 xPTS, and Crystal Palace at the bottom with 21.28 xG and 22.91 xPTS. Each row also includes a small green or red percentage change indicator next to the xG and xPTS values.

No	Team	M	W	D	L	G	GA	PTS	xG	xGA	xPTS
2	Manchester City	24	16	3	5	65	27	51	64.29 +0.71	24.87 +2.13	54.52 +3.52
1	Liverpool	23	22	1	0	54	15	87	47.98 -6.02	22.04 +7.04	46.99 +20.01
4	Chelsea	24	12	4	8	41	32	40	48.21 -7.21	26.17 +6.83	46.50 +6.50
5	Manchester United	24	9	7	8	36	29	34	41.72 +5.72	24.77 +4.27	44.08 +10.08
3	Leicester	24	15	3	6	52	24	48	40.30 +11.70	31.27 +7.27	39.81 +8.19
7	Wolverhampton Wanderers	24	8	10	6	35	32	34	35.21 +0.21	27.06 +4.92	38.91 +4.91
9	Southampton	24	9	4	11	31	42	31	35.51 +4.51	34.25 +7.75	36.47 +5.47
12	Everton	24	8	6	10	28	35	30	34.45 +6.45	30.91 +4.09	35.56 +5.56
6	Tottenham	24	9	7	8	38	32	34	32.34 +5.66	31.40 +0.80	34.37 +0.37
8	Sheffield United	24	8	9	7	25	23	33	30.77 -5.77	31.40 +8.40	33.29 +0.29
19	Watford	24	5	8	11	21	36	23	32.38 -11.38	37.23 +1.23	32.50 +9.50
15	Brighton	24	6	7	11	27	34	25	32.98 +5.98	37.36 +3.38	32.50 +7.50
10	Arsenal	24	6	12	6	32	34	30	30.53 +1.47	34.36 +0.36	31.80 +1.80
13	Burnley	24	9	3	12	28	38	30	29.58 -1.58	33.82 -6.18	30.15 +0.15
18	Bournemouth	24	6	5	13	23	37	23	25.81 +2.81	39.27 +2.27	23.84 +0.84
11	Crystal Palace	24	7	8	8	22	28	30	21.28 +0.72	37.24 +8.24	22.91 +7.09

Source: Understat

- Generally very good finishers who outperform their xG. More or less on par for open play goals.
- Big threat from corners and set pieces (Van Dijk 4 goals in 19/20, most notably scoring a brace vs Brighton (H))
- Only Firmino out of the front 3 has underperformed his xG (by 7.49) despite having the 2nd highest xG in the league (15.49) so prioritise restricting chances falling to Mane and Salah.

Analytics

Shot analysis

Benchmarking finishing ability with wider xG data

2019/20 PL	xG	Goals
Total	61.03	66
Outside box	5.01	6
Penalty area	39.99	47
Six-yard box	16.92	11
OG	2	2

EPL 2019/2020																
Table	Charts	overall	home	away	Start date	End date	M	W	D	L	G	GA	PTS	xG	xGA	xPTS
2 Manchester City		24	16	3	5	65	27	51	64.28	0.71	24.87	-2.13	54.52	+3.52		
1 Liverpool		23	22	1	0	54	15	87	47.98	-6.02	22.04	+7.04	46.89	+20.01		
4 Chelsea		24	12	4	8	41	32	40	48.21	-7.21	26.17	-6.83	46.50	+6.50		
5 Manchester United		24	9	7	8	36	29	34	41.72	+5.72	24.77	-4.27	44.08	+10.08		
3 Leicester		24	15	3	6	52	24	48	40.30	+11.70	31.27	+7.27	39.81	+8.19		
7 Wolverhampton Wanderers		24	8	10	6	35	32	34	35.21	+0.21	27.06	-4.92	38.91	+4.91		
9 Southampton		24	9	4	11	31	42	31	35.51	-4.51	34.25	-7.75	36.47	+5.47		
12 Everton		24	8	6	10	28	35	30	34.45	+6.45	30.91	-4.09	35.56	+5.56		
6 Tottenham		24	9	7	8	38	32	34	32.34	-5.34	31.40	-6.80	34.37	+0.37		
8 Sheffield United		24	8	9	7	25	23	33	30.77	-5.77	31.40	+8.40	33.29	+0.29		
19 Watford		24	5	8	11	21	36	23	32.38	+11.38	37.23	+1.23	32.50	+9.50		
15 Brighton		24	6	7	11	27	34	25	32.98	-5.98	37.36	+3.36	32.50	+7.50		
10 Arsenal		24	6	12	6	32	34	30	30.53	-1.47	34.36	+0.36	31.80	+1.80		
13 Burnley		24	9	3	12	28	38	30	29.58	-1.58	33.82	-6.18	30.15	+0.15		
18 Bournemouth		24	6	5	13	23	37	23	25.81	+2.81	39.27	+2.27	23.84	+0.84		
11 Crystal Palace		24	7	8	8	22	28	30	21.28	-0.72	37.24	+8.24	22.91	+7.09		

Source: Understat

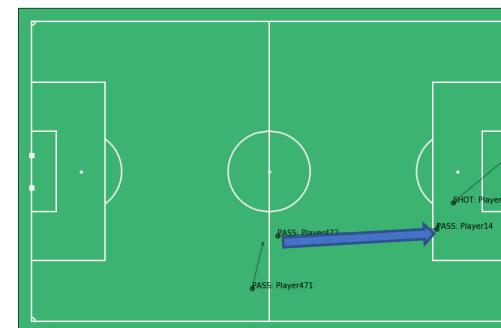
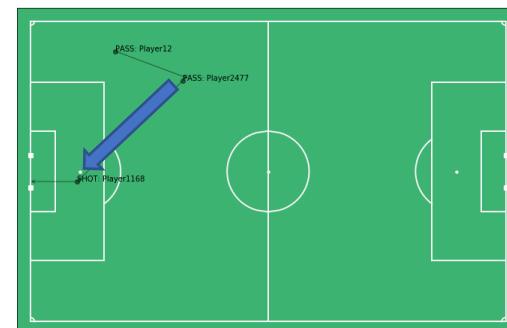
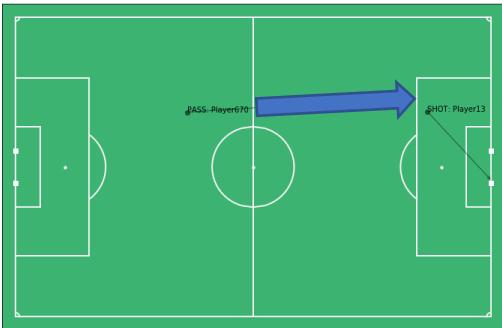
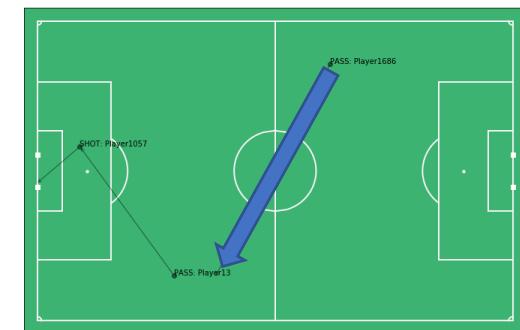
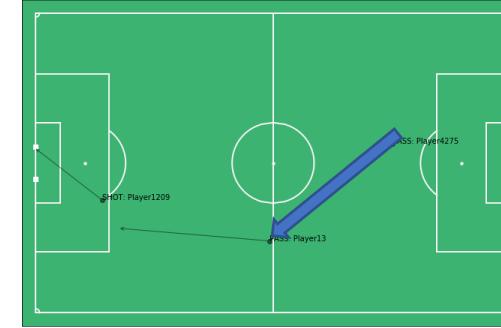
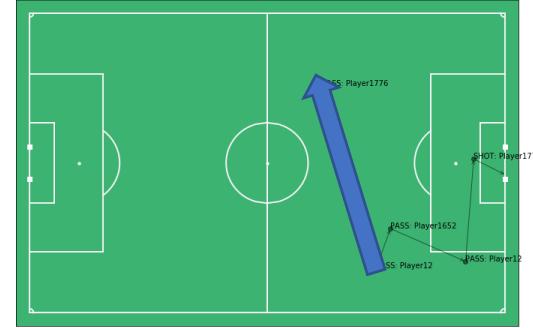
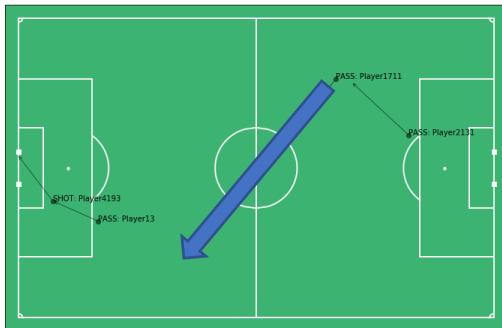
- Liverpool have vastly outperformed their xG inside the penalty area so this is by far their most effective finishing area
- Underperformed xG within the six-yard box suggests some challenges with very close-range finishing (associated with confined spaces/crammed box/fast instincts/reflexes needed rather than 'time to think about the shot'.)

Analytics

Passing analysis

Let's look at some passages of play from the Last Row dataset, can you guess some goals? (passes, shots denoted by black arrows)

Long Passes (highlighted in blue): Diagonal + Cross Field + Down the pitch → Risk taking, defenders capable at passing from either side, fast forwards (watch their runs)



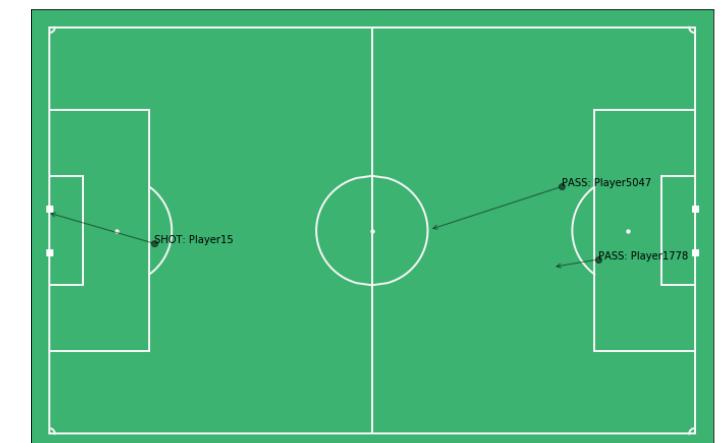
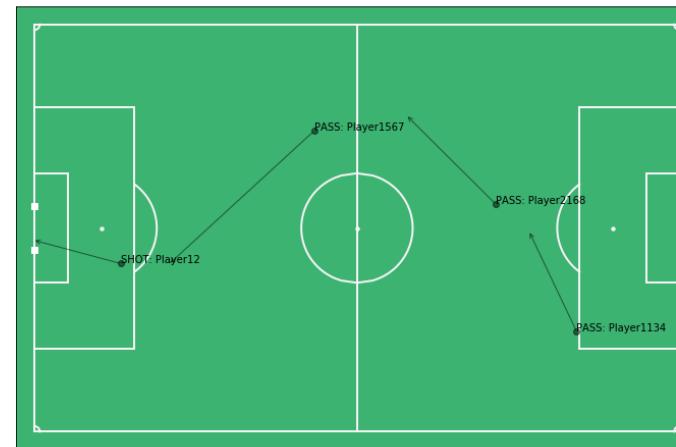
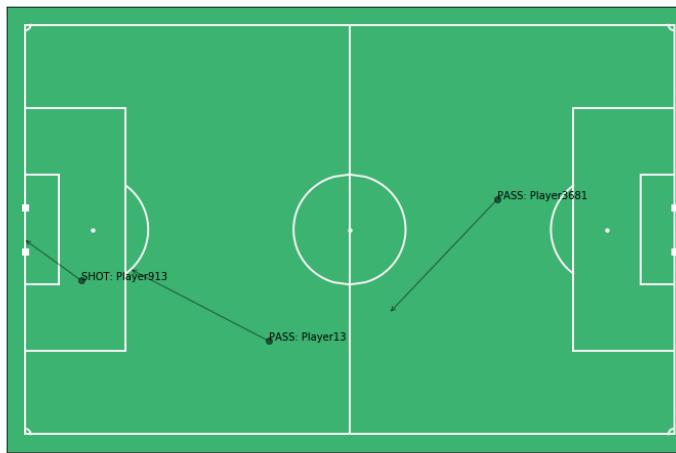
Note that the player numbers are still tied to those in the Last Row dataset (don't correspond to any real shirt numbers)

Analytics

Passing analysis

Let's look at some passages of play from the Last Row dataset, can you guess some goals? (passes, shots denoted by arrows)

Gaps between arrows → Confident dribbling of ball and ball progression through midfield into the attacking half; quick transition play and spotting of runs

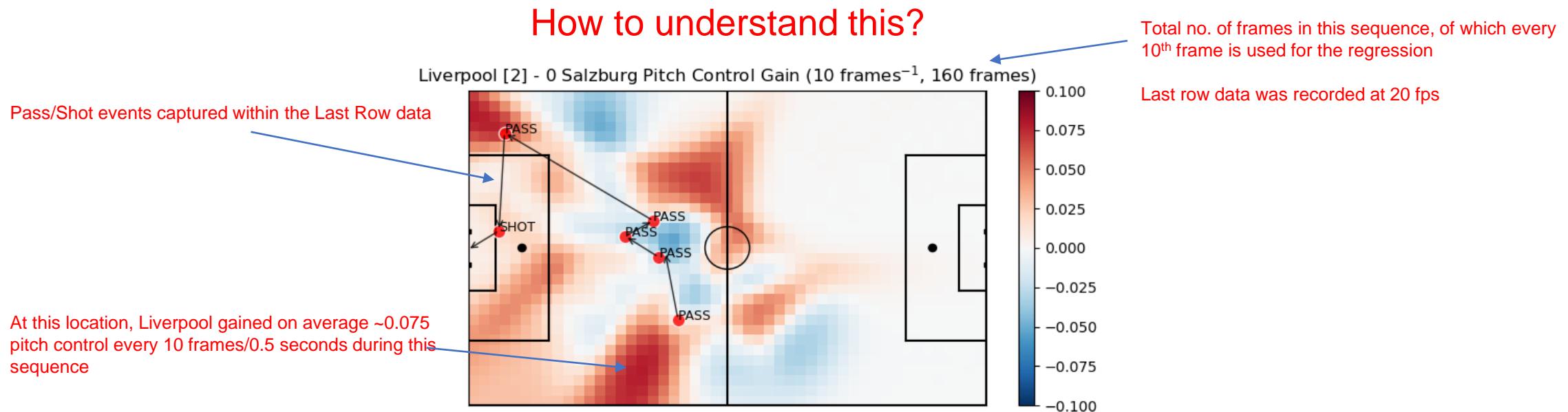


Analytics

Pitch Control

Using the Pitch Control (PC) model (Spearman et al., 2017) implemented in Python by Laurie Shaw (Metrica Sports), we can see **how much** PC Liverpool gains and **where** over the course of each sequence of play for the 19 provided goals.

Pitch control gain per grid cell is calculated as the Linear regression slope from every 10th frame from frame 0 up to the last (stated) frame (approx. the point of the goal shot being taken).



Analytics

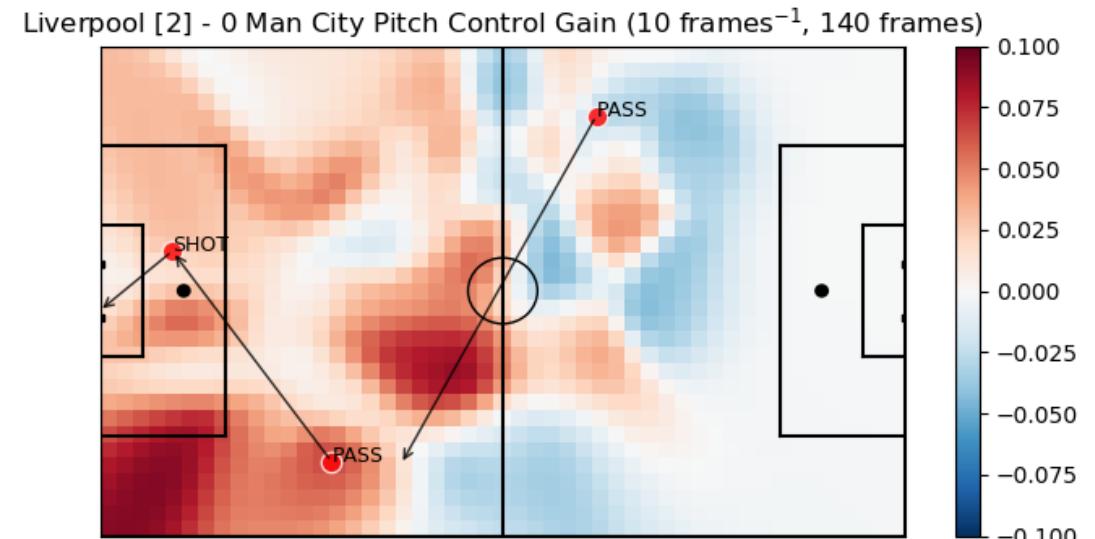
Pitch Control

Case Study 1: Liverpool [2] – 0 Man City, 10 Nov 2019

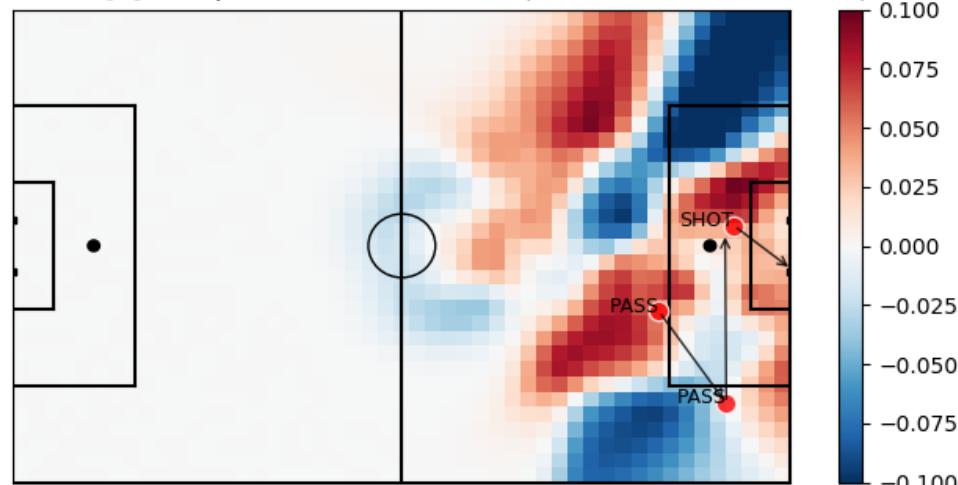
A textbook Klopp LFC goal that encapsulates the **speed** of his Liverpool's break, Salah's header to make it 2-0 back in November.

The successful long diagonal spearheads a surge in Liverpool's pitch control from the centre circle into left midfield.

By the time of Salah's shot (frame 140), Liverpool have made gains all across City's box thanks to the runs of Liverpool's 3 forwards.



Leicester 0 - [3] Liverpool Pitch Control Gain (10 frames⁻¹, 100 frames)



Case Study 2: Leicester City [0] – [3] Liverpool, 26 Dec 2019

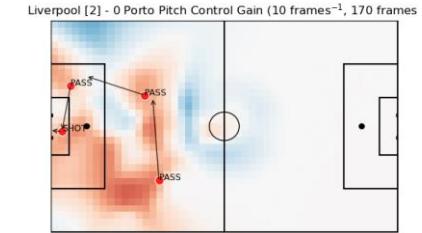
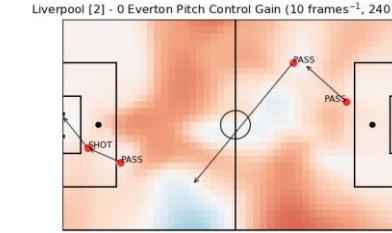
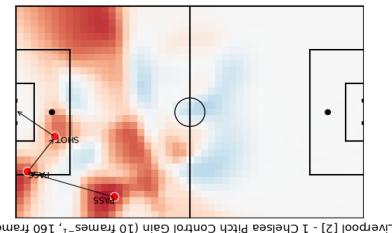
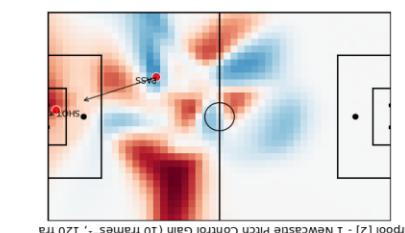
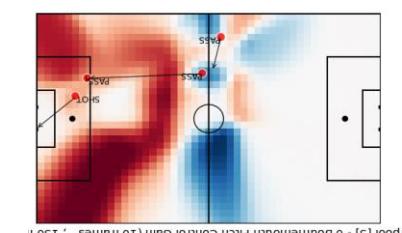
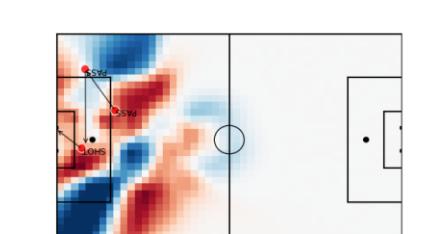
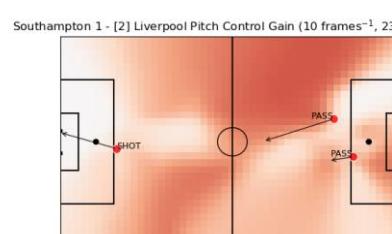
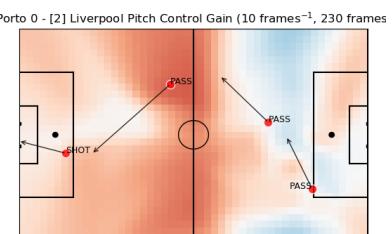
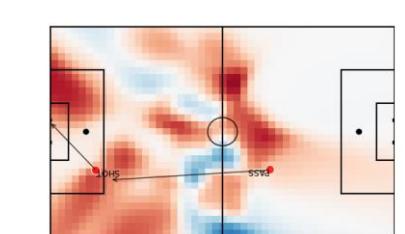
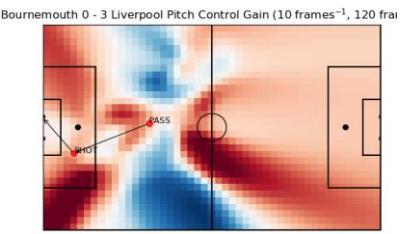
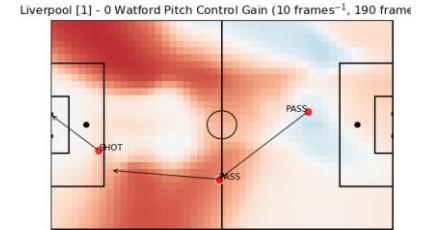
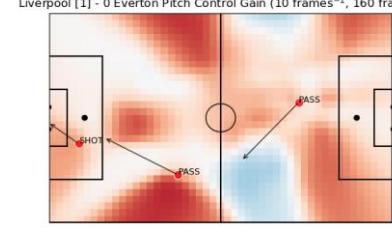
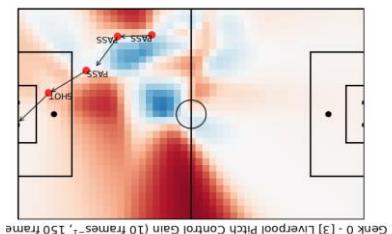
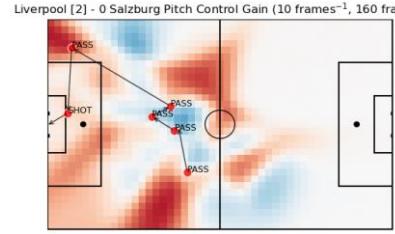
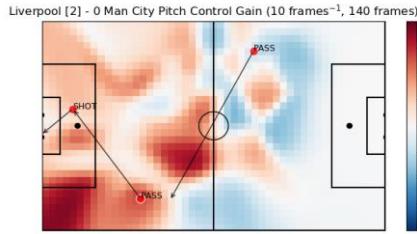
Although the pass before this (from Firmino) which I consider to be the most important in this sequence isn't in the Last Row dataset, the runs of 4 players (inc. Firmino himself who scored) lead to huge gains diagonally up to where Firmino takes his shot.

Leicester gain a lot of **(unproductive) control** near the left corner and a bit on their left penalty box but ultimately TAA's driven ball bypasses the defence into a Liverpool controlled area.

Analytics

Pitch Control

Can we identify patterns of play from these maps of Pitch Control Gain?



*all maps below have been (lazily) oriented and cropped such that Liverpool score on the left goal. All colourmaps share the same range, more intense red = more Liverpool gain

Analytics

Pitch Control

Can we identify patterns of play from these maps of Pitch Control Gain?

Some first impressions:

- Liverpool appear to gain a lot of / the most Pitch Control down the left flank during these successful attacking sequences → dangerous runs made by LB (Robertson), Mane (LF), even if not directly involved in the goal.
- Generally though the Pitch Control gain is well spread across the attacking third/ opponent box with slightly more emphasis of making breakthroughs down the wings → well coordinated attack with threat from all sides by the time of the shot being hit.
- Might be useful to seek more robust patterns of Pitch Control gain from a much larger dataset that also includes chances created by Liverpool.

Discussion

Challenges

1. Limited dataset (only 19 goals), data might've been cherry picked/ not representative of the typical attacking patterns/plays Liverpool employs.
2. Not all goals include the full sequence of events that lead up to a goal. What defines the 'start' of an attack sequence?
3. xG model used is still very raw (only based on angle subtended by the goal posts and distance of shot). Some inaccuracies e.g. Firmino 2-0 goal against Porto was assigned xG of 0.02 despite being scored from within the six-yard box.

Need to perform further checks



Discussion

Future work

1. Using more data to pick out recurring patterns in Liverpool's play and pitch control.
2. Where does Liverpool control the most on average? Where can we **exploit any failings** in their positioning and decision making?
3. Is it possible, with a large amount of pitch control gain maps, to segment them into clusters which identify the common ways Liverpool gain pitch control during their attacks which could help (e.g. if Liverpool are conceding control most of the time in a certain area during successful attacks, it may be worth **valuing that area less** when defending against them).
4. Looking at individual player actions and contributions to control. The work so far has focused on a team level picture, analysing overall team shape over individual play. Hence each player's actions are relatively "blurred" out in the pitch control gain maps. Knowledge of individual player's pitch control tendencies can help inform more **bespoke defensive making decisions** (e.g. man/zonal marking)

Summary

The Liverpool Attack:

1. Highly potent Front 3 and attacking Full-Backs. Mark the Full-Backs tightly and prevent crosses from the flanks.
2. High quality chance creation and above average finishing quality. Underperforming xG inside six yards.
3. Long Balls (forward, cross-field), speedy runners and highly coordinated passing (watch for passing cues!)
4. Dribbling ability and ball progressing from deep. Don't allow the players to pick up and pace and be prepared to foul whenever necessary.
5. Avoid the loss of pitch control, especially on their flanks by occupying the right spaces and marking runners.

Thank You

Acknowledgements: David Sumpter (@soccermatics) and the Friends of Tracking initiative

Liverpool tracking data: Ricardo Tavares (@lastrowview)

Event data for xG: WyScout

Misc stats: Transfermarkt, Understat

Pitch Control model: William Spearman (Liverpool FC), Laurie Shaw (Metrica Sports)

Links to own code used will be provided soon (separately)