

Michael Maclean

Football Data Analyst Portfolio

- MSc Sport Data Analytics student, University of Strathclyde
- Recruitment Analyst Intern, Dundee United FC
- Opposition Scout & Match Analyst Volunteer, Berwick Rangers FC

This portfolio presents selected examples of my work across football data analysis, video workflows, and performance reporting.

The examples provided combine event data, programming, video-review, and statistical modelling to show how I translate football information into practical outputs for recruitment and technical staff.

The collection, cleaning, and reporting workflow shown throughout is what I would apply to GPS, fitness-testing, and other physical performance data.

Contents

- Chelsea LB/LWB Summer 2026 Review
- Scottish Premiership 2025/26 Throw-in Analysis Dashboard
- Coding and Tagging Set-up
- Video & Post-Match Analysis Examples ([YouTube link](#))
- Opposition Analysis Sample
- Scouting Recruitment Example (Dundee United experience)
- Points Above Replacement (MSc dissertation project)
- Poisson-based Probability Model ([Google Sheets link](#))
- Kinovea Angle Export

Chelsea LB/LWB Summer 2026 Review

Following Chelsea's managerial appointment of Xabi Alonso and left back Pep Chavarría, I produced a compact, data-driven review of their options in the left back/left wing-back position.

The main finding was that Chavarría does not stand out, from a data point-of-view, as the ideal LWB that Alonso will be looking for in his system.

My presentation can be viewed [here on Google Slides](#).



The Replacement

- Pep Chavarría (28 years old)
 - Joined Chelsea for ~£16m from Rayo Vallecano
- Played last season at LB, usually in a 4-2-3-1
 - Question marks over his fit to LWB if Alonso plays 3-4-3
- His stats from last season do not compare closely to Grimaldo's
 - Will be expected to press higher and with more intensity
 - Attacking creativity will need to increase as well



Season performance	
Minutes played: 2,681	
Expected assists (xA)	0.11
Chances created	0.91
Touches in opposition box	0.97
Possession won final 3rd	0.13

Per 90

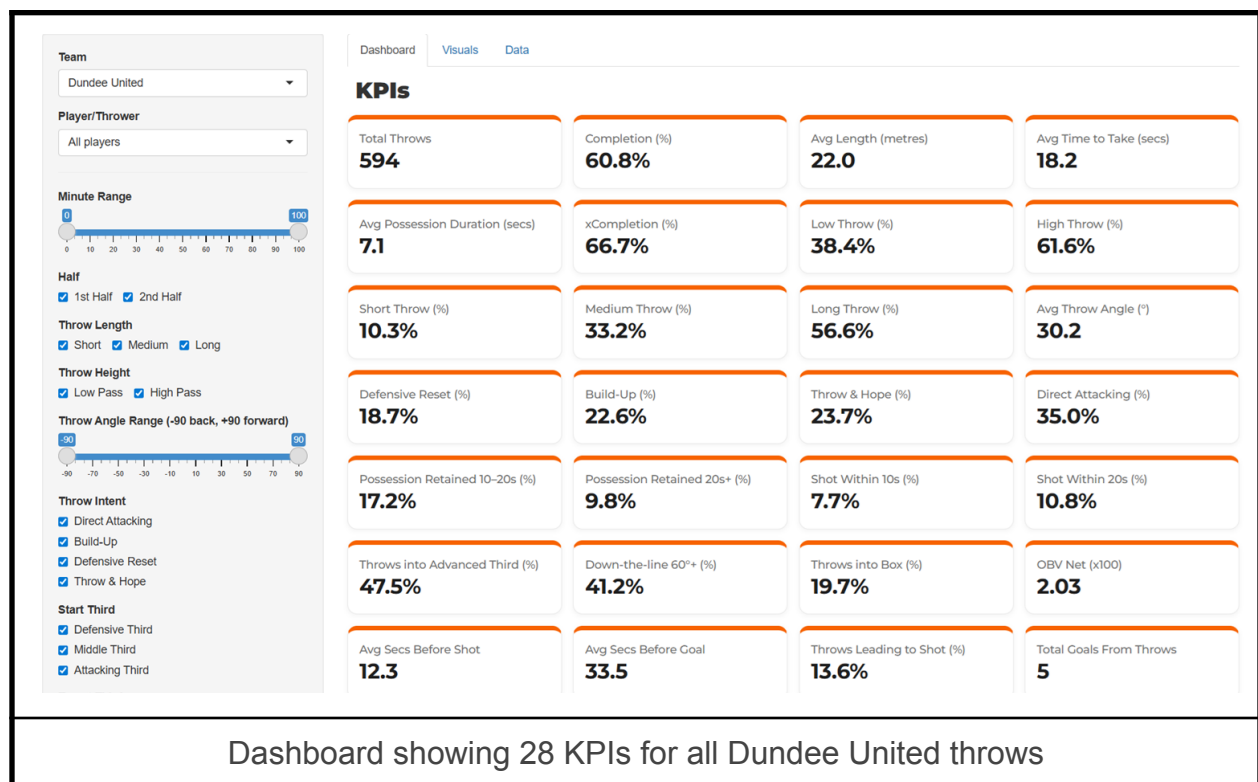
Scottish Premiership Throw-In Dashboard

This project is part of my professional placement at Dundee United and focuses on measuring throw-in outcomes across the Scottish Premiership using StatsBomb event data in R.

Starting from an initial brief around short throw-ins, I expanded the analysis to compare throw lengths, ball retention, end-of-possession outcomes, and on-ball value creation.

The underlying pipeline extracts event data from the StatsBomb API, cleans and structures it in R, computes custom metrics, and saves to a CSV file which the dashboard reads from. The same pipeline would be applied directly to GPS and performance-testing data.

The end product is an interactive Shiny R dashboard designed to improve visibility of team and player tendencies through KPI summaries, filters, and visual reporting.



Team

Motherwell

Player/Thrower

All players

Minute Range

0100

Half

☒ 1st Half
☒ 2nd Half

Throw Length

☐ Short
☐ Medium
☒ Long

Throw Height

☒ Low Pass
☒ High Pass

Throw Angle Range (-90 back, +90 forward)

-9090

Throw Intent

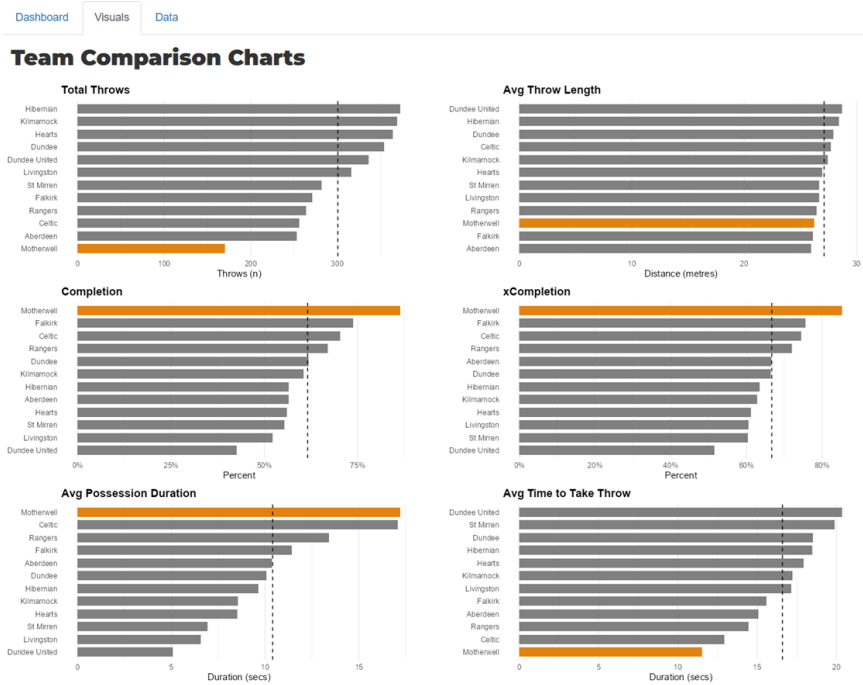
☒ Direct Attacking
☒ Build-Up
☒ Defensive Reset
☒ Throw & Hope

Start Third

☒ Defensive Third
☒ Middle Third
☒ Attacking Third

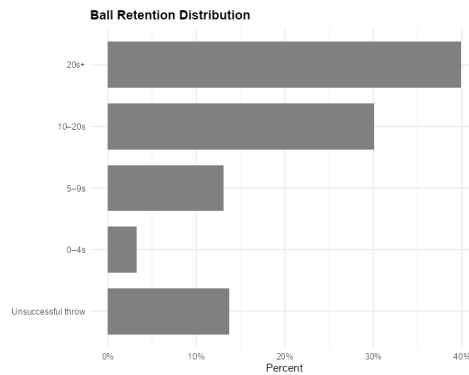
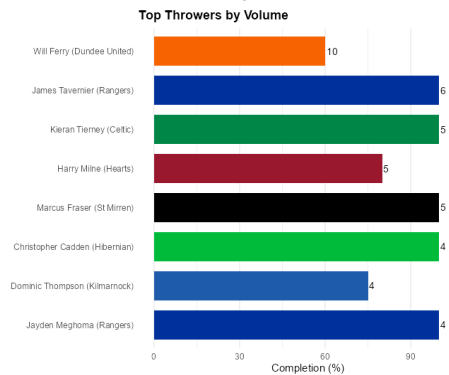
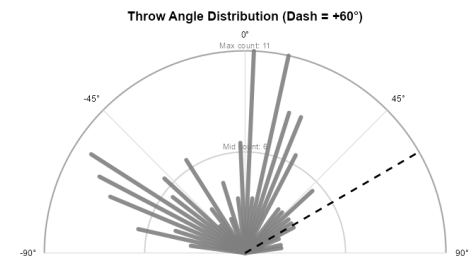
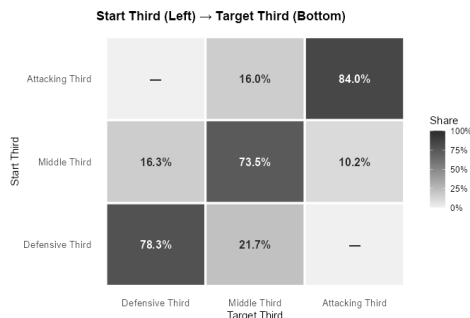
Target Third

☒ Defensive Third
☒ Middle Third

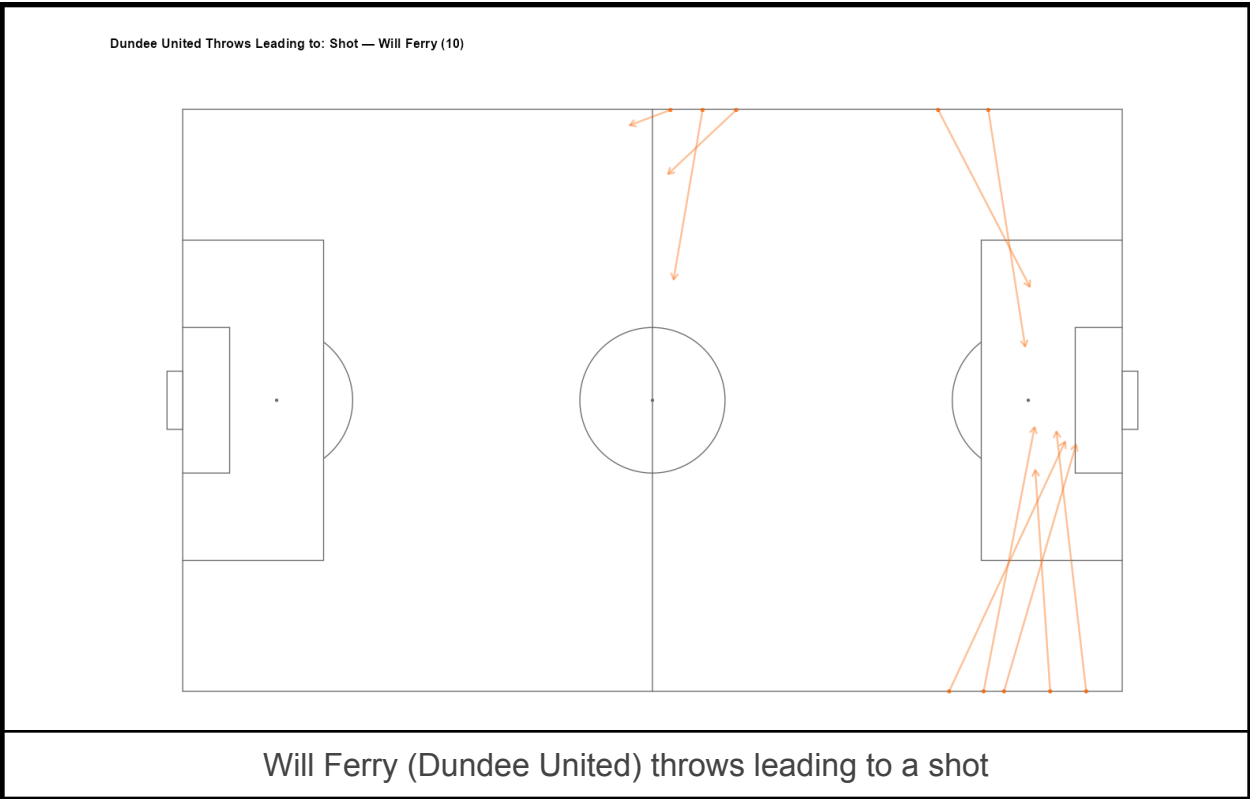
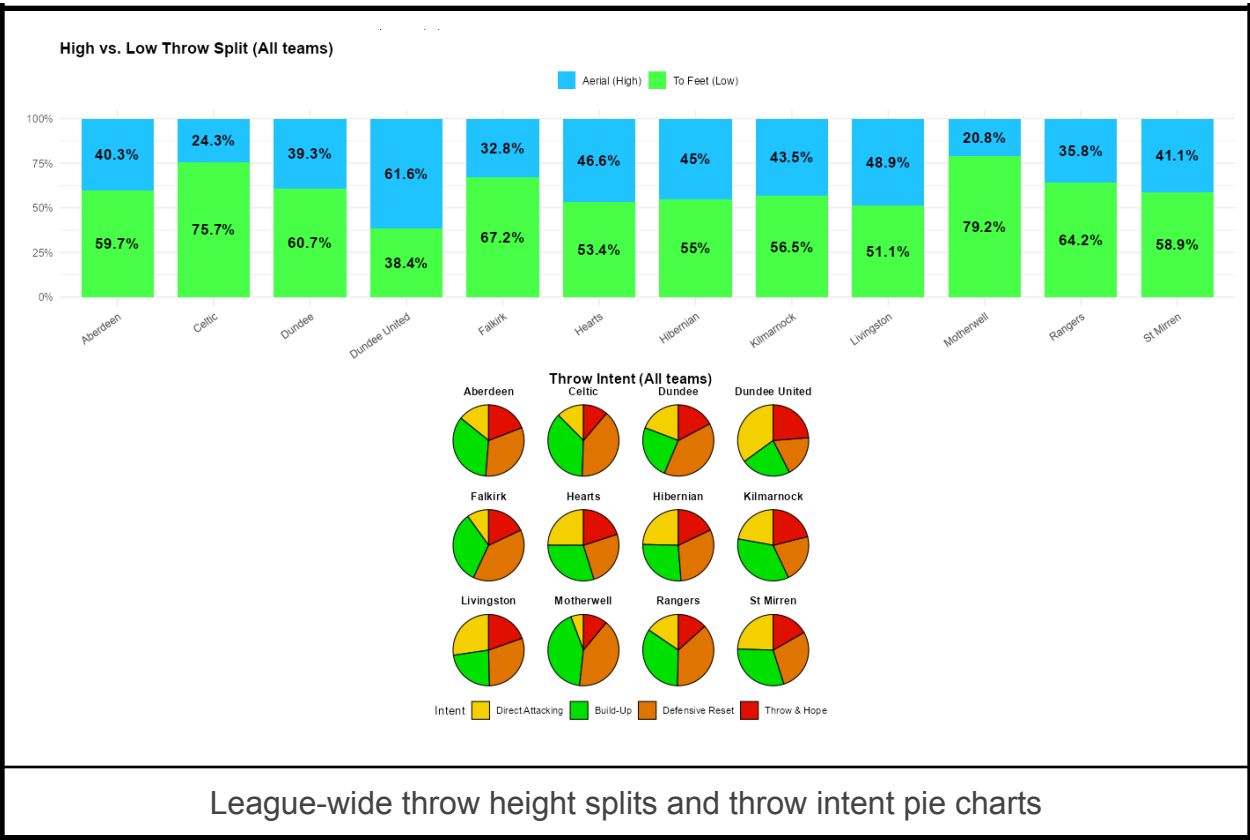


Selected team (Motherwell) visual comparisons for long throws (>20 metres)

Distribution Patterns



Distribution pattern visuals for throws which lead to a shot across all teams



Coding and Tagging Set-up

Coding and tagging footage is the foundation of my match and opposition analysis workflow.

Using Nacsport Scout, I built a custom tagging panel tailored to how the Berwick Rangers staff prioritise analysis, so that every meaningful action that they would like to see can be captured from footage and turned into a filterable clip database for coaching and recruitment use.

The panel below shows the main buttons group events by match phase (attacking outcomes, defensive actions, set-pieces, transition and organisation phases, and disciplinary events) which the coaching staff prioritise for review. Both teams' players are laid out by squad number and position down each side so every tagged event is attributed to a specific player and team.

Hotkeys are encoded to quicken the clip tagging workflow (for example, G for goal, C for clearance, and 4 for corner).

The screenshot displays the Nacsport Scout interface during a match between Berwick Rangers and Clydebank. The main window shows a live video feed of the game. To the right, a custom tagging panel is visible, featuring a hexagonal grid of buttons for different event types, color-coded by category: green for attacking outcomes, red for defensive actions, yellow for set-pieces, and grey for transition and organisation phases. Below the grid, a list of player names and positions is shown for both teams. At the bottom, a clip database table lists tagged events with their time, category, and descriptors.

Time	Category	Descriptors	Notes
45:57.32	goal	Berwick Rangers: 19 RM	1-1
44:56.46	clearance	Berwick Rangers: 17 RCB	
43:56.11	goal-kick	Berwick Rangers: 24 GK	
42:55.48	tackle	17 RCB: Berwick Rangers	
41:55.29	throw-in	Clydebank: Away LB	
40:55.08	clearance	Away LB: Clydebank	
39:54.36	goal	Berwick Rangers: 19 RM	

Custom Nacsport tagging panel and coded output for Berwick Rangers v Clydebank

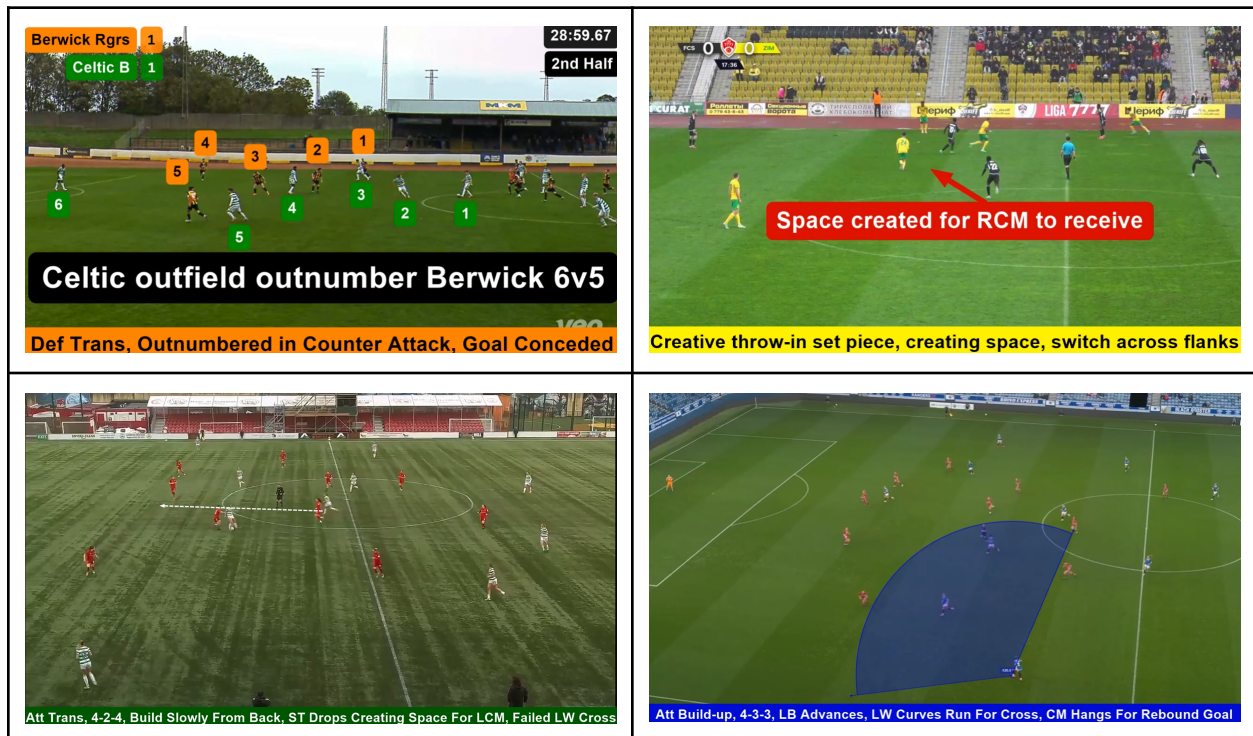
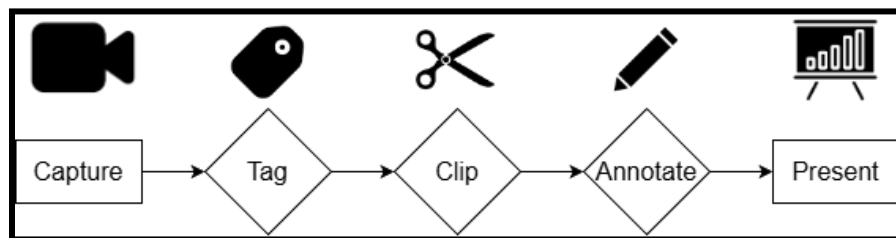
Video & Post-Match Analysis Examples

Video analysis is an important supporting part of my workflow, particularly when contextualising data-led observations and presenting concise visual evidence to staff.

Using tagged footage and Wyscout/Veo clips, I build short annotated sequences that highlight patterns, player actions, and key moments clearly and efficiently.

A number of video examples from men's and women's matches can be [found here on YouTube](#) where I show how I present my analysis for short segments.

- Clips used to support scouting and reporting
- Annotations used to highlight shapes, spaces, and player actions
- Presentation kept concise enough to preserve context without losing attention



Opposition Analysis Sample

As part of our opposition analysis reports at Berwick Rangers, we note team formations at different transition stages, patterns in set piece routines, and other general insights from the pre-recorded video of the fixture.

The following screenshots are a short selection of the scouting observations I made for an opposition analysis report of Hearts B from Veo recorded footage.

Date: 19/08/2025	Venue: Ainslie Park Stadium
Home Team: Hearts B	Away Team: Gala Fairydean Rovers
Base Formation: 4-2-4	Base Formation: 4-2-3-1
Competition: Scottish Lowland League	Score: (HT 0-1) (FT 0-2)
Weather: Dry, cloudy, and eventually dark, 15°C	Scout: Michael Maclean
Team Report: Hearts B	

Formations

	Attacking Shape
	This is based on a left sided attack (which was most common) • 11 attacks directly and aggressively with 3 behind in support • 9 drops into a CAM role as 27 takes the main poacher role. • 15 just in around/behind 9 for further support • 2 looks to cover the gap in LB area • 17 tucks into a more RCB role

Set-Piece Routines

Free-Kick	Attacking Set Play
	• Frequently played short as quickly as possible • Depending on distance to goal, the next pass is always either a low-cross or a long ball • Cross is floated with no real pace on it • In the image shown, 11 passes the free-kick short to 3 He then plays a poor low-cross to the right side which is cleared easily
Free-Kick	Defending Set Play
	• Strikers not overly involved in defence, - look spring on the counter attack • Wingers are utilised defensively • Defensive players hold a fairly high line when possible

Key Takeaways

Strengths	Weakness
Energy - they are full of it They play quick, fast, and instant	Attacking players aren't up to the physicality levels of GF Rovers defenders Aerial duels, except the 2 CBs Sometimes their fast play is too fast for themselves
Key Player	Opposition Success
Dom Plank #11 (LW) He is <i>the</i> ever beating drum of the Hearts B attack. • Speedy • Tricky • Full of energy • Hard worker defensively	Catching opposition sleeping with their quick, instant set-pieces. Tricky play from the more skillful players drew in fouls.

Scouting Recruitment Example

As part of my recruitment analyst placement with Dundee United, I supported the recruitment workflow by reviewing prospective signings identified through a data-first process on a weekly basis.

My role was to assess whether the Wyscout video aligned with the underlying data profile, summarise the player’s style and performance in a concise written report, and score key recruitment traits including athleticism, physicality, technical ability, off-ball movement, and overall suitability.

All reports are produced under strict confidentiality protocols. The example below has been anonymised and has been written in Google Docs instead of the shared scouting database, but it reflects the same workflow used in practice. Where StatsBomb data is available, I create a simple radar chart in R to profile the player before video review.

Wide Player A #7

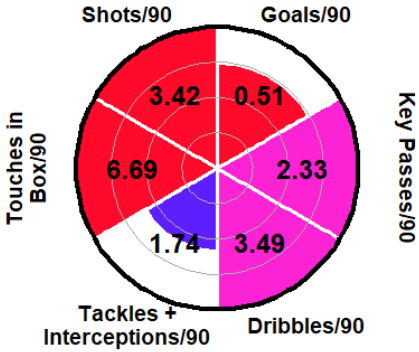
Club, Country 1st Tier

Report	
DD Mon 2026, Home v Away	
Very energetic, speedy, composed right-winger. Finished the match with 2 goals, but could easily have left the game with more, as well as assists. This match aligned extremely well with his season player data profile. Used his explosive pace to great effect late in the first half as he sped past the opposition defensive line to get himself a nicely finished right-footed goal. His second came from pouncing on an opposition defensive error and anticipating the mistake correctly - scored with his left foot. Very confident in his ability to directly attack defenders 1v1 with his speed and comfortable with his technical ability (further strengthened with his two-footedness). His out-of-possession contribution was less consistent across the full match, although he reacted well in pressing transitions when nearby. Overall, this was a very strong viewing that strongly matches the data profile. Shots on-target (4/4) Successful dribbles (5/7)	

Scoring	
Athleticism	9
Physicality	6
Technical Ability	9
Off-ball Movement	8
Overall	9

Wide Player A

Compared to similar position players from the same 2024/25 league season with 720+ minutes



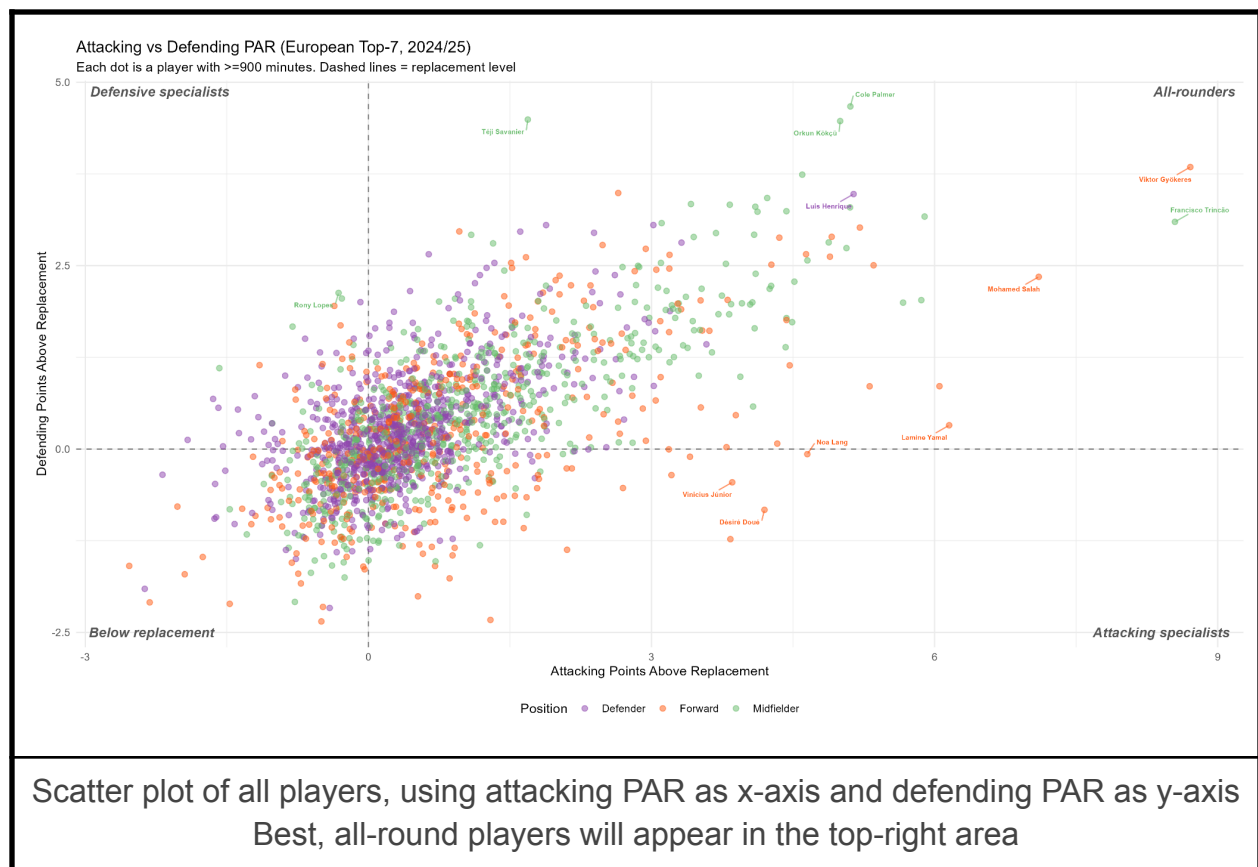
Stat	Value
Shots/90	3.42
Goals/90	0.51
Key Passes/90	2.33
Dribbles/90	3.49
Tackles + Interceptions/90	1.74
Touches in Box/90	6.69

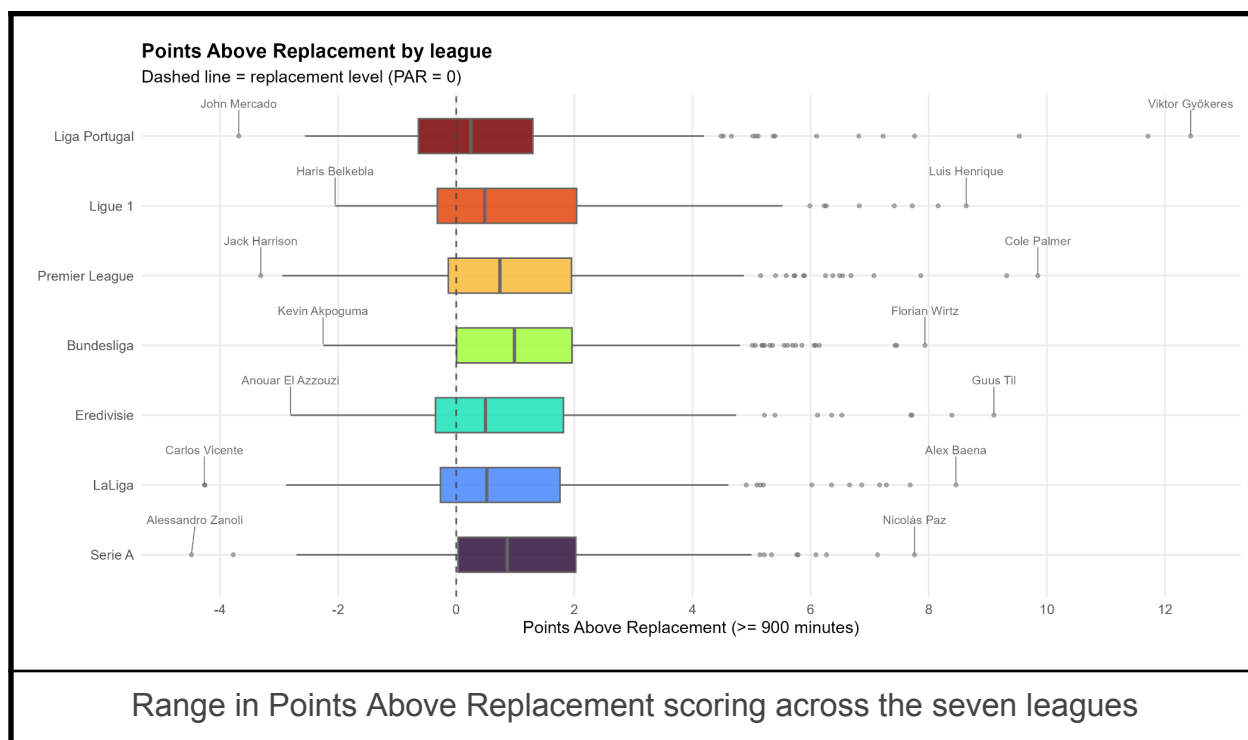
Points Above Replacement Model

My MSc dissertation research explores a football adaptation of baseball's Wins Above Replacement (WAR) sabermetric by building a footballing Points Above Replacement (PAR) framework for outfield players across Europe's top seven men's leagues.

The aim is to evaluate player contribution from the 2024/25 season relative to replacement-level alternatives and support a robust player comparison model in performance and recruitment contexts by using web scraped FBref data.

Findings showed that Viktor Gyökeres was the most valuable player in the dataset. He scored 12.4, meaning had Sporting Lisbon replaced him with a replacement-level striker they'd be 12 points (4 wins) worse off.





Only one player who ranked top in PAR also won their league's real-world Player of the Season award, with 5/7 Player of the Season winners ranking in the PAR top 3.

Player of the Season (Real world)	League	PAR Ranking	Player of the Season (Using PAR #1)
Viktor Gyökeres	Liga Portugal	1	Viktor Gyökeres
Mohamed Salah	Premier League	2	Cole Palmer
Ousmane Dembélé	Ligue 1	2	Luis Henrique
Sem Steijn	Eredivisie	2	Guus Til
Harry Kane	Bundesliga	3	Florian Wirtz
Raphinha	La Liga	6	Alex Baena
Scott McTominay	Serie A	7	Nicolás Paz

Poisson-Based Football Probability Model

This long-running modelling project estimates match outcome probabilities across multiple leagues using a Poisson distribution. Statistics are season-long and can display trends and movements within team performance.

The model began in Google Sheets and covered around 100 leagues, before moving to a Python platform for improved scalability, automation, and processing speed.

Alongside expected scorelines and result probabilities, I developed a weighted form metric that places greater emphasis on recent fixtures to better capture short-term team movement over the season. The scoring ranges from zero (6 straight losses) to one (6 straight wins), which can be interpreted as a 0%–100% scale.

I have a small selection of leagues available [to view here on Google Sheets](#) from men's and women's football. To prevent scraping errors, leagues are likely not up-to-date and captured from a previous date.

Team	League	Index	GP	HGP	AGP	GF	HGF	AGF	OSTrength	HS	AS	GC	HGC	AGC	OWeakness	HW	AW	HomePower	AwayPower	Overall	Form	AGS
AFC Wimbledon	Eng L1	2	45	22	23	51	25	26	0.871	0.752	1.028	68	27	41	1.162	1.068	1.233	-0.316	-0.205	-0.290	0.222	58.542
Barnsley	Eng L1	3	45	22	23	67	38	29	1.144	1.143	1.147	70	34	36	1.196	1.344	1.083	-0.201	0.064	-0.051	0.430	AGS by HT
Blackpool	Eng L1	4	45	23	22	53	35	18	0.905	1.053	0.712	65	29	36	1.110	1.147	1.083	-0.094	-0.371	-0.205	0.844	33.250
Bolton	Eng L1	5	45	22	23	68	44	24	1.162	1.323	0.949	49	21	28	0.837	0.830	0.842	0.493	0.107	0.325	0.474	AGS by AT
Bradford	Eng L1	6	45	23	22	56	32	24	0.957	0.962	0.949	50	17	33	0.854	0.672	0.992	0.290	-0.044	0.102	0.444	25.292
Burton Albion	Eng L1	7	45	23	22	48	27	21	0.820	0.812	0.830	58	28	30	0.991	1.107	0.902	-0.295	-0.072	-0.171	0.415	AGS by HT pM
Cardiff City	Eng L1	8	45	23	22	86	50	36	1.469	1.504	1.423	45	23	22	0.769	0.909	0.662	0.594	0.762	0.700	0.822	1.478
Doncaster	Eng L1	9	45	23	22	47	27	20	0.803	0.812	0.791	68	32	36	1.162	1.265	1.083	-0.453	-0.292	-0.359	0.407	AGS by AT pM
Exeter City	Eng L1	10	45	22	23	51	29	22	0.871	0.872	0.870	59	27	32	1.008	1.068	0.962	-0.195	-0.093	-0.137	0.393	1.124
Huddersfield	Eng L1	11	45	23	22	70	42	28	1.196	1.263	1.107	64	27	37	1.093	1.068	1.113	0.196	-0.006	0.102	0.348	Season Games
Leyton Orient	Eng L1	12	45	22	23	57	30	27	0.974	0.902	1.068	69	28	41	1.179	1.107	1.233	-0.205	-0.166	-0.205	0.096	552
Lincoln City	Eng L1	13	45	23	22	87	53	34	1.486	1.594	1.344	41	20	21	0.700	0.791	0.632	0.803	0.713	0.796	0.881	Games so far
Luton Town	Eng L1	14	45	23	22	65	37	28	1.110	1.113	1.107	54	24	30	0.922	0.949	0.902	0.164	0.205	0.188	0.881	540
Mansfield	Eng L1	15	45	22	23	57	33	24	0.974	0.992	0.949	46	23	23	0.786	0.909	0.692	0.083	0.257	0.188	0.548	97.83%
Northampton	Eng L1	16	45	22	23	37	21	16	0.632	0.632	0.633	71	28	43	1.213	1.107	1.293	-0.476	-0.661	-0.581	0.000	Home table
Peterborough	Eng L1	17	45	22	23	63	38	25	1.076	1.143	0.988	65	27	38	1.110	1.068	1.143	0.075	-0.154	-0.034	0.170	9
Plymouth	Eng L1	18	45	23	22	72	33	39	1.230	0.992	1.542	61	33	28	1.042	1.305	0.842	-0.312	0.700	0.188	0.652	https
Port Vale	Eng L1	19	45	22	23	36	17	19	0.615	0.511	0.751	59	23	36	1.008	0.909	1.083	-0.398	-0.331	-0.393	0.444	Away table
Reading	Eng L1	20	45	22	23	64	33	31	1.093	0.992	1.226	59	27	32	1.008	1.068	0.962	-0.075	0.263	0.095	0.230	10
Rotherham	Eng L1	21	45	23	22	39	24	15	0.666	0.722	0.503	68	32	36	1.162	1.265	1.083	-0.543	-0.490	-0.495	0.252	https
Stevenage	Eng L1	22	45	22	23	48	26	22	0.820	0.782	0.870	46	13	33	0.786	0.514	0.992	0.268	-0.123	0.034	0.578	Form tables
Stockport	Eng L1	23	45	23	22	68	38	30	1.162	1.143	1.186	57	26	31	0.974	1.028	0.932	0.115	0.254	0.188	0.422	14
Wigan Athletic	Eng L1	24	45	23	22	49	24	25	0.837	0.722	0.988	57	17	40	0.974	0.672	1.203	0.050	-0.215	-0.137	0.570	Nation
Wycombe	Eng L1	25	45	22	23	66	42	24	1.127	1.263	0.949	56	21	35	0.957	0.830	1.053	0.433	-0.104	0.171	0.170	england3

League One stats table (from before final gameweek 2025/26)
Lincoln City best overall score (0.786), Northampton worst overall score (-0.581)
Lincoln City and Luton Town both claim best form (0.881)
Plymouth Argyle best away attack (1.542), Rotherham best home defence (0.514)

Screenshot taken 02 May 2026

Plymouth	0.652	Away	2 Mayton - *h2hymout	17	h2h
(Most recent) Win	2	6	Home25 Aprth* - F*2:1*	http	2:1
Draw	1.8	1.8	Away21 Aprd - *Pl*1:1*ymoutam.as		1:1
Win	1.6	4.8	Away18 Apedon - *1:3*ymouth*		1:3
Draw	1.4	1.4	Home11 Aprh* - E*2:2*	Fine	2:2
Win	1.2	3.6	Away6 Apry - *Pl*0:3*ymouth*		0:3
(Least recent) Loss	1	0	Home3 Apruth* - *1:2*		1:2

 **Results**
  **Multiplier**
  **Result * Multiplier = Scoring**

Plymouth Argyle form explained

Form from least recent to most recent: LWDWDW

Fluctuating pattern of wins and draws recently, although their only loss was in their least recent game

Final form score: 0.652 (65.2%)

Screenshot taken 02 May 2026

Game Number	Date and Time	Team Name	Expected Goals	0	1	2	3	4	5	6	HW	Draw	AW
11	Sat 2 May 15:00	Stevenage	1.390	24.90%	34.62%	24.06%	11.15%	3.88%	1.08%	0.25%	Stevenage	X	Wigan Athletic
	Eng L1	Wigan Athletic	0.571	56.49%	32.26%	9.21%	1.75%	0.25%	0.03%	0.00%	57.03%	27.66%	15.25%
				40.70%	33.44%	16.64%	6.45%	2.06%	0.55%	0.13%	1.75	3.61	6.55
											0.578	Form	0.570
22		24	Score H/A				Chance				1.390	xG	0.571
		130	0 - n	14.07%	8.03%	2.29%	0.44%	0.06%	0.01%	0.00%	75.04%	Scoring	43.48%
			1 - n	19.56%	11.17%	3.19%	0.61%	0.09%	0.01%	0.00%	56.46%	CS	24.90%
			2 - n	13.59%	7.76%	2.22%	0.42%	0.06%	0.01%	0.00%	32.63%	<-BTTS	
	r - BTTS	r - Nil	3 - n	6.30%	3.60%	1.03%	0.20%	0.03%	0.00%	0.00%	42.39%	Win to nil	10.84%
HW	14.64%	42.39%	4 - n	2.19%	1.25%	0.36%	0.07%	0.01%	0.00%	0.00%			
D	13.59%	14.07%	5 - n	0.61%	0.35%	0.10%	0.02%	0.00%	0.00%	0.00%			
AW	4.42%	10.84%	6 - n	0.14%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%			

Stevenage vs Wigan Athletic match prediction

Predicted to be low-scoring but edged towards the home side

Stevenage in slightly better form (0.578 v 0.570)

A Stevenage 1-0 win has highest probability @19.56% (which was the final score)

Screenshot taken 02 May 2026

Kinovea Angle Export

Kinovea is a free, open-source video analysis tool used widely across sport science and strength & conditioning to measure joint angles, analyse movement, and provide video-based technique feedback to athletes.

For my BSc Data Science Honours project, I contributed to the tool directly via GitHub, extending its CSV export so that frame-by-frame joint-angle measurements are saved alongside the existing coordinate data for further analysis in spreadsheet or statistical software. The patch was reviewed, merged into the main repository, and remains part of the Kinovea release today.

The poster below shows the pre-patch export (x/y coordinates only), in-app angle annotation, and the post-patch output (which adds the angle measurements).

Video Analysis of Limb Angle During Training

Michael Maclean
BSc Data Science

Kinovea

Staff within the University's sports department use a free software application called Kinovea.

Kinovea is an open-source video analysis tool which is used by athletes, coaches, and sport scientists around the world.

Staff find it frustrating that angle values are not included when Kinovea exports data to a spreadsheet file.

	A	B	C	D	E	F	G	H
1	Key Images							
2	Name	Time (s)						
3	0.00	0.000						
4								
5	Angles							
6	Name	Time (s)	Value (°)					
7	Angle 1	0.000	108.32					
8								
9								
10	Angle 1							
11		a	b					
12	Time (s)	X (px)	Y (px)	X (px)	Y (px)	X (px)	Y (px)	
13	0.000	96.10	32.06	38.45	-112.67	-34.49	141.79	
14	0.033	86.00	16.00	34.00	-130.00	-34.00	139.00	
15	0.067	73.00	1.00	27.00	-144.00	-34.00	136.00	
16	0.100	62.00	-10.00	16.00	-154.00	-33.00	135.00	
17	0.133	52.00	-18.00	3.00	-159.00	-33.00	134.00	
18	0.167	46.00	-22.00	-11.00	-159.00	-33.00	132.00	
19	0.200	45.00	-23.00	-24.00	-154.00	-34.00	133.00	



	B	C	D	E	F	G	H
1	Key Image						
2	Name	Time (s)					
3	0.00	0.000					
4							
5	Angles						
6	Name	Time (s)	Value (°)				
7	Angle 1	0.000	108.32				
8							
9							
10	Angle 1						
11		a	b				
12	Time (s)	X (px)	Y (px)	X (px)	Y (px)	X (px)	Angle (°)
13	0.000	96.10	32.06	38.45	-112.67	-34.49	141.79 108.32
14	0.033	86.00	16.00	34.00	-130.00	-34.00	139.00 116.10
15	0.067	73.00	1.00	27.00	-144.00	-34.00	136.00 124.00
16	0.100	62.00	-10.00	16.00	-154.00	-33.00	135.00 129.05
17	0.133	52.00	-18.00	3.00	-159.00	-33.00	134.00 131.62
18	0.167	46.00	-22.00	-11.00	-159.00	-33.00	132.00 130.25
19	0.200	45.00	-23.00	-24.00	-154.00	-34.00	133.00 125.37

UNIVERSITY of
STIRLING



Solution 1

I have created a graphical user interface (GUI) in Python which the staff can use as a secondary tool alongside Kinovea. This GUI will allow the user to upload videos and spreadsheet files so the angle values can be amended. They will also be able to view a view with angle overlay and graphs relevant to their data.

Solution 2

Given Kinovea is open-source software available on GitHub, I have written code in C# which fixes the issue directly at the source.

My pull request was accepted by the Kinovea admin and will now provide angle measurements to all spreadsheet exports.

stir.ac.uk

For further information contact: Michael Maclean

BE THE DIFFERENCE

Dissertation poster presentation