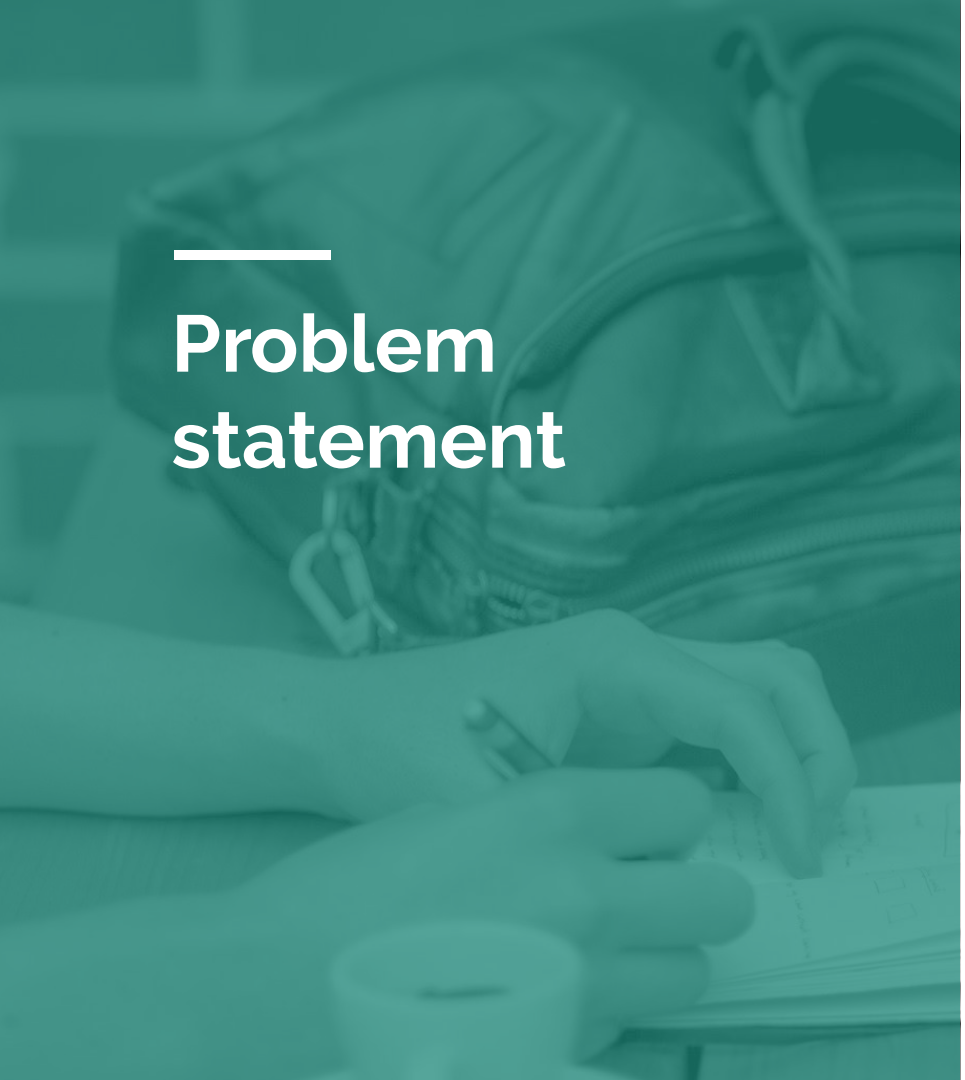
Predicting Goalscorers in Football

Modelling goalscorers to make profit in the sports betting market

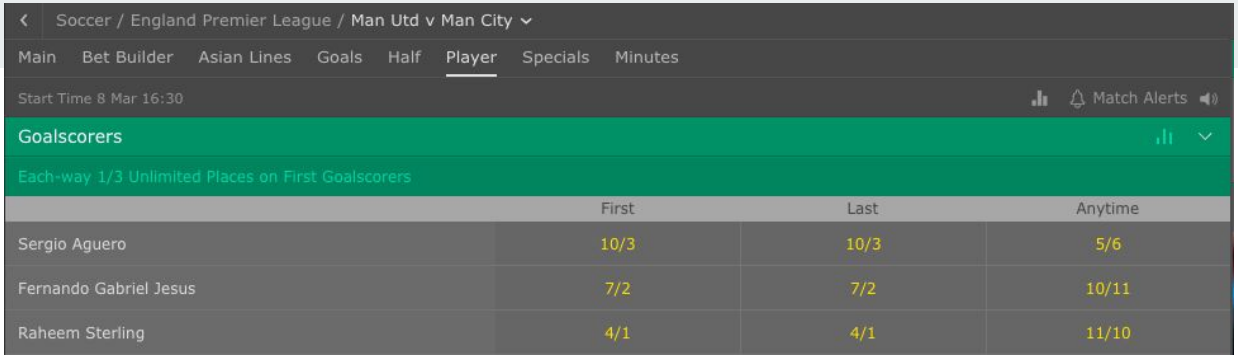


Problem statement

Quantifying a players chance of scoring in an individual football match .

By comparing my results to the betting market, I can quantify how successful I am and generate profit.

Example

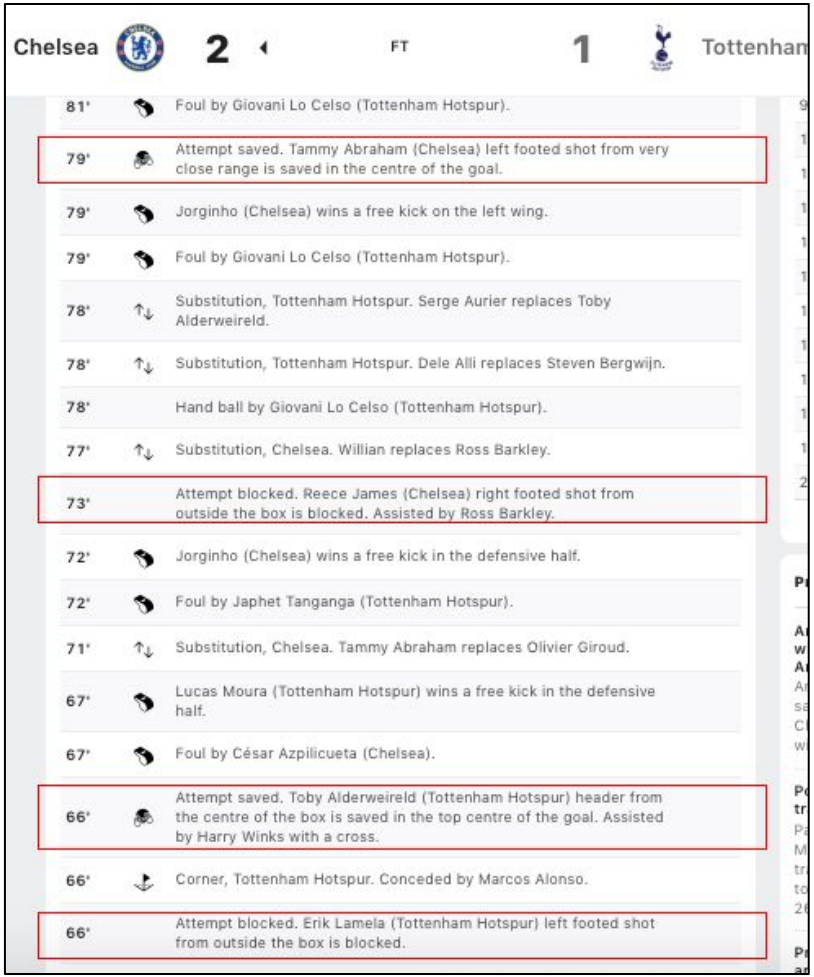


- The betting markets provides odds on a player to score
- Sergio Aguero is ⅝ to score, this can converted to a percentage. So we can say Sergio Aguero has a 54.64% chance to score.
- If my model predicts that Sergio Aguero will score 60% of the time. Then for that selection I can say I have an 9.8% edge on the market.
  - 0.6/0.5464 = 1.098
- Therefore my goal is to build a model that highlights players where my probabilistic projections are higher than the betting markets odds.

Collecting data

01

- I scraped all the match commentary data from ESPN for over 20 leagues for the last 3 seasons.
- This totaled 642,045 shots taken by 42,533 players from 1,652 teams.



Creating Metrics

02

- The data gives me various shot locations, from this I can see the success rate of scoring a goal from each location
- I can also look at each individual players goal percentage from each location
- From this data I could calculate a expected goals metric for each player

	shot_location	shots	goal%
0	header - centre of the box	35593	0.11
1	header - difficult angle	571	0.03
2	header - side of six yard box	4360	0.19
3	header - side of the box	1701	0.03
4	header - very close range	4196	0.45
5	shot - centre of the box	53557	0.23
6	shot - difficult angle	4841	0.10
7	shot - difficult angle and long range	1336	0.08
8	shot - long range	3566	0.03
9	shot - outside the box	99134	0.04
10	shot - side of the box	40612	0.09
11	shot - side of the six yard box	5452	0.29
12	shot - very close range	6145	0.66

shot_location	player	shots	goal%
header - centre of the box	Lionel Messi	17	0.00
header - very close range	Lionel Messi	1	0.00
shot - centre of the box	Lionel Messi	117	0.35
shot - difficult angle	Lionel Messi	12	0.17
shot - difficult angle and long range	Lionel Messi	1	0.00
shot - long range	Lionel Messi	2	0.00
shot - outside the box	Lionel Messi	205	0.04
shot - side of the box	Lionel Messi	44	0.07
shot - side of the six yard box	Lionel Messi	10	0.20
shot - very close range	Lionel Messi	8	0.88

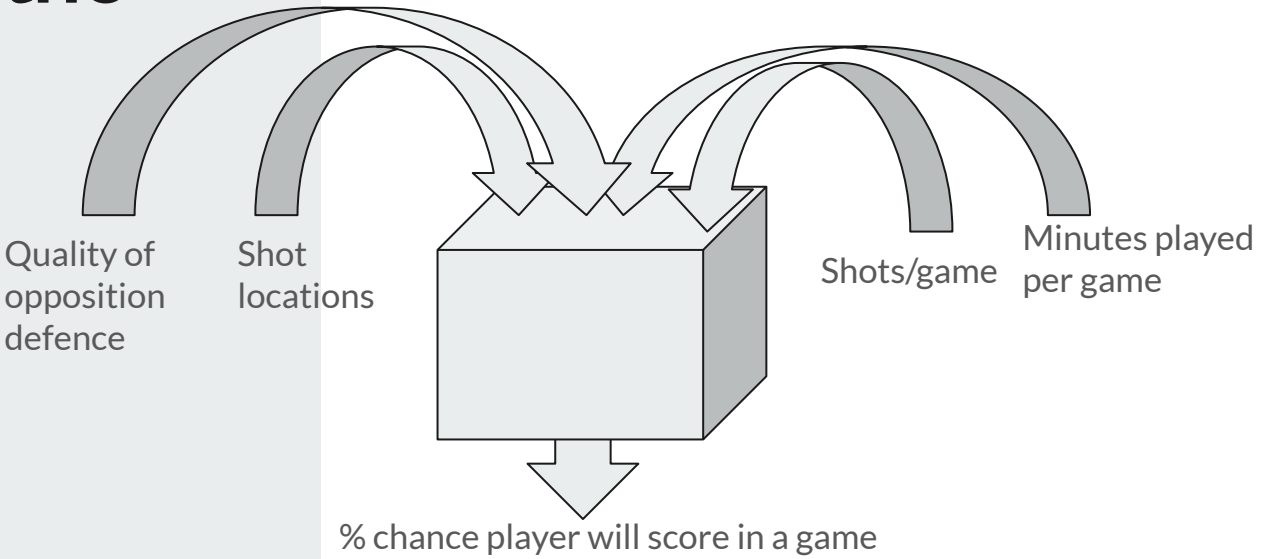
shot_location	player	shots	goal%
header - centre of the box	Cristiano Ronaldo	64	0.09
header - side of six yard box	Cristiano Ronaldo	6	0.17
header - side of the box	Cristiano Ronaldo	2	0.00
header - very close range	Cristiano Ronaldo	7	0.57
shot - centre of the box	Cristiano Ronaldo	102	0.22
shot - difficult angle	Cristiano Ronaldo	9	0.00
shot - difficult angle and long range	Cristiano Ronaldo	7	0.00
shot - long range	Cristiano Ronaldo	4	0.00
shot - outside the box	Cristiano Ronaldo	128	0.01
shot - side of the box	Cristiano Ronaldo	91	0.10
shot - side of the six yard box	Cristiano Ronaldo	10	0.30
shot - very close range	Cristiano Ronaldo	16	0.44

player	xg	goals	dif
Robert Lewandowski	69.444	63	6.444
Lionel Messi	64.354	64	0.354
Mohamed Salah	61.213	62	-0.787
Cristiano Ronaldo	57.458	53	4.458
Kylian Mbappé	56.841	54	2.841
Paulinho	52.016	48	4.016
Ciro Immobile	51.274	50	1.274
Pierre-Emerick Aubameyang	50.553	52	-1.447
Sergio Agüero	50.046	50	0.046
Harry Kane	48.636	50	-1.364
Luis Suárez	48.092	53	-4.908
Lawrence Shankland	47.679	63	-15.321
Sadio Mané	46.459	45	1.459
Timo Werner	45.805	45	0.805
Jarrod Bowen	44.742	47	-2.258
Aleksandar Mitrovic	43.985	44	-0.015
Romelu Lukaku	43.464	41	2.464
Edinson Cavani	43.139	41	2.139
Ollie Watkins	41.986	43	-1.014
Mauro Icardi	41.750	41	0.750

Modelling and Automating the Data

03

- I then used various statistical techniques to model this data (linear regression, logistic regression, conditional algorithms, monte carlo simulations)
- I also wanted to make the model fully automated so I could click a button and it would give me the suggested bets.



Outputs

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- ➔ Merge the odds dataset with the goalscorer dataset
- ➔ Calculate the selections which are projected to be profitable
- ➔ Output the selections that are profitable

date	league	player	H	A	Odds	Games	Avg/mins	Proj_ROI
2020-01-11 14:00:00	2019-20 Italian Serie A	Radja Nainggolan/Cagliari	Cagliari	AC Milan	6.50	15	80.67	46.25%
2020-01-11 15:00:00	2019-20 English League Two	Joss Labadie/Newport County	Scunthorpe	Newport County	8.50	17	79.24	126.95%
2020-01-11 15:00:00	2019-20 English League One	Ian Henderson/Rochdale	Rochdale	Bolton	2.60	18	83.72	28.7%
2020-01-11 15:00:00	2019-20 English League One	Ivan Toney/Peterborough United	Peterborough United	Gillingham	2.70	20	88.75	51.2%
2020-01-11 15:00:00	2019-20 English League Championship	Jake Cooper/Millwall	Stoke	Millwall	17.00	24	90.00	97.2%
2020-01-11 15:00:00	2019-20 English League Two	Padraig Amond/Newport County	Scunthorpe	Newport County	3.30	21	71.10	49.16%
2020-01-11 15:00:00	2019-20 English League Two	Josh Gordon/Walsall	Cheltenham	Walsall	4.00	22	65.14	38.8%
2020-01-11 15:00:00	2019-20 English League Championship	Alex Mowatt/Barnsley	Barnsley	Huddersfield	8.00	23	88.13	72.8%

Results!

05

➔ After optimising and subsetting the dataset I have the following results.

Bets: 152
Profit: 45.15
Return on Investment: 29.7%

Picks for the weekend

06

Picks here.....

Questions?