



What goes into a shot on goal?

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Soccer is typically low-scoring, every shot counts!

- Team's averaged only 4.2 shots on target and 1.25 goals per game
- What factors into a shot resulting in a goal?
- Can xG be interpreted to improve tactics and assess performance?

Classification Workflow

I

Data Acquisition

2

Cleaning and EDA

3

**Model Evaluation
& Feature
Engineering**

4

**Final Testing &
Conclusions**



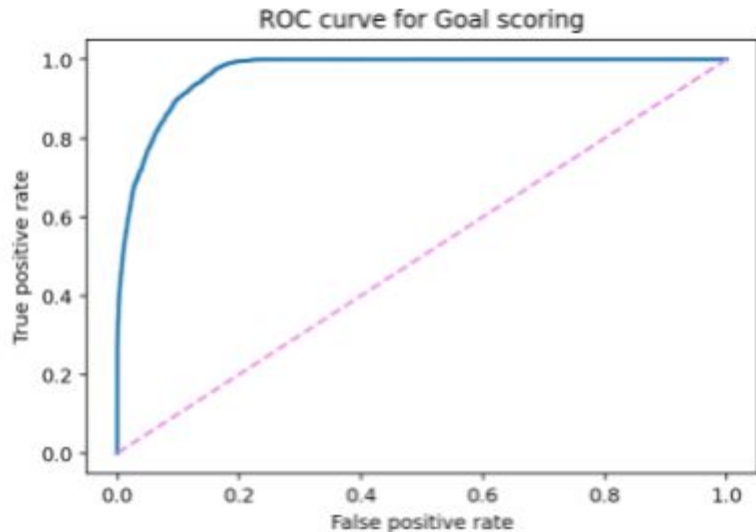
Desired outcomes of model

1. Interpretability
2. F1 score
3. Minimal log loss



Final Model

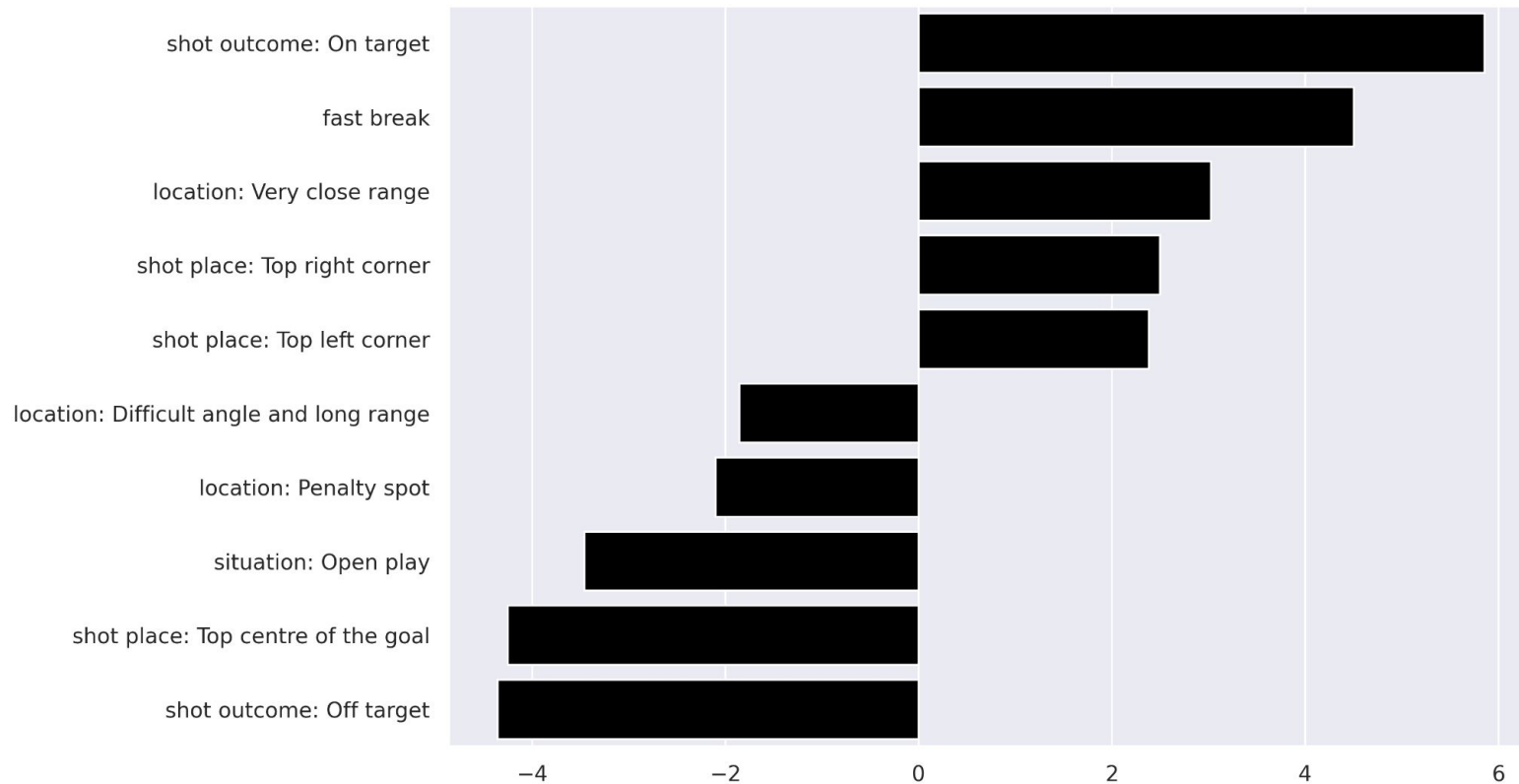
ROC AUC score = 0.9652781351938904



Logistic Regression model

- test set f1 = .56
- log loss = .24
- # of features = 48
- Feature coefficients!

Largest Logistic Regression Coefficients



Feature interpretation

- HIT THE TARGET!
- Get on the break
- don't settle for shots from outside the box
- if possible, place it in the corners of the goal



Conclusions

- Key attributes worth looking into when evaluating a team/player
- Not all variables in control of offensive player
- Counter attacks and set pieces could be worth practicing



Future Studies



GK and Defenders

Image learning AI to account for defender positioning



Physical metrics

Shot speed, ball spin, location as a distance from goal



Team vs Player

Do players or teams account for more high percentage chances

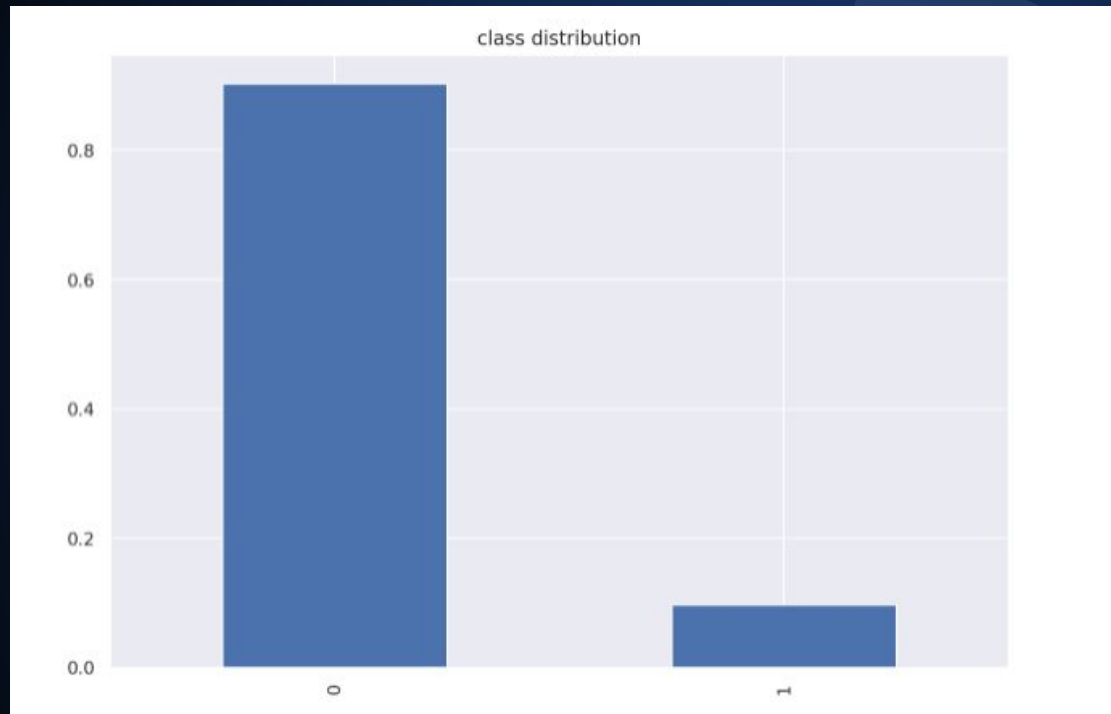
Questions?

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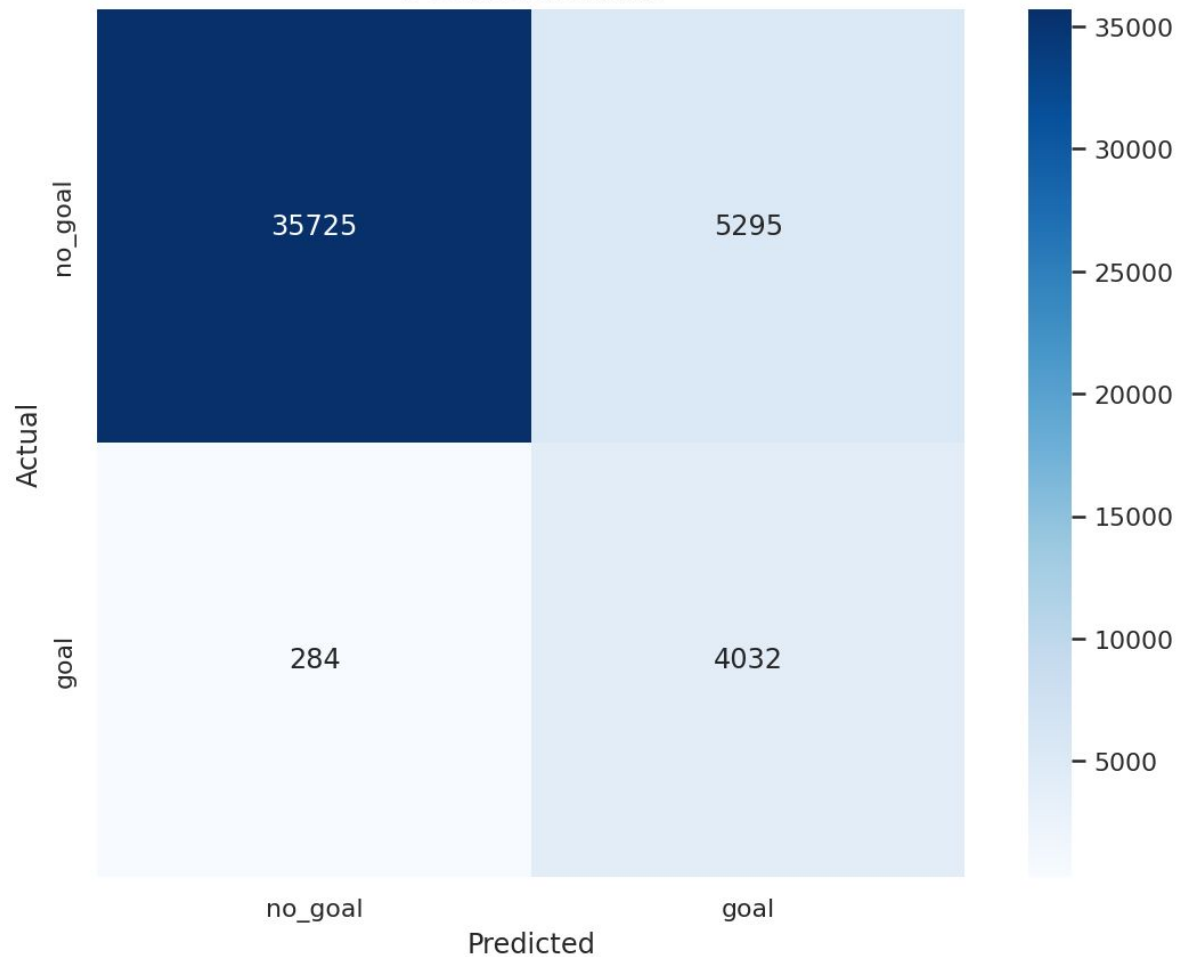
Appendix





event_team	opponent	player	player2	shot_place	shot_outcome	is_goal	location	bodypart	assist_method	situation	fast_break	Near_or_far_post
Hamburg SV	Borussia Dortmund	mladen petric	gokhan tore	High and wide	Off target	0	Left side of the box	left foot	Pass	Open play	0	NaN
Borussia Dortmund	Hamburg SV	shinji kagawa	mario gotze	Top right corner	Off target	0	Outside the box	right foot	Pass	Open play	0	NaN
Borussia Dortmund	Hamburg SV	kevin grosskreutz	mario gotze	Bottom right corner	On target	1	Left side of the box	left foot	Pass	Open play	0	Far post
Borussia Dortmund	Hamburg SV	mats hummels	NaN	Blocked	Blocked	0	Outside the box	right foot	None	Open play	0	NaN
Hamburg SV	Borussia Dortmund	tomas rincon	NaN	Blocked	Blocked	0	Outside the box	right foot	None	Open play	0	NaN

lr confusion matrix



Precision and Recall Curves

