



UFC Prediction

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Project Overview



The purpose of this project is to create a machine learning model to predict the outcome of UFC (Ultimate Fighting Championship) fighting events.

Problem

Bookmaking (odds-setting) for UFC fights is difficult, with the "favorite" historically winning only 60 percent (approximately) of the time .

Solution

This project will increase these odds by creating an application which can model and predict the winner of individual fights and calculate model-predicted probabilities of who will win.

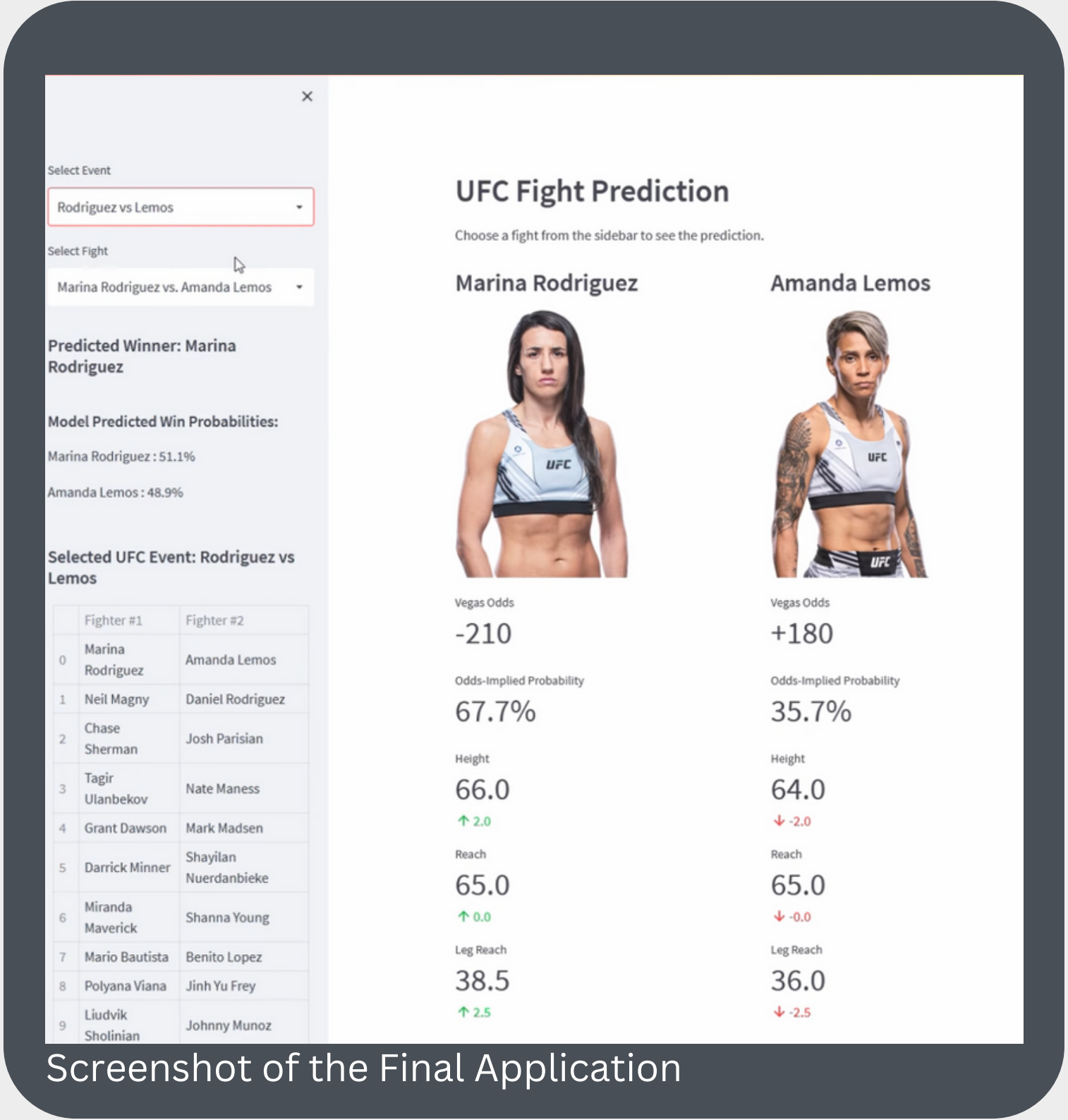


Product Overview

The final product is a web application that predicts the winner of a selected UFC match.

The product also displays the "Vegas" odds and compares them to its own model-calculated odds.

This product could be used by **bookmakers** looking to **increase revenues** by **increasing the accuracy of their odds-making** above the abysmal 60 percent it stands at currently.



Stakeholder Metrics

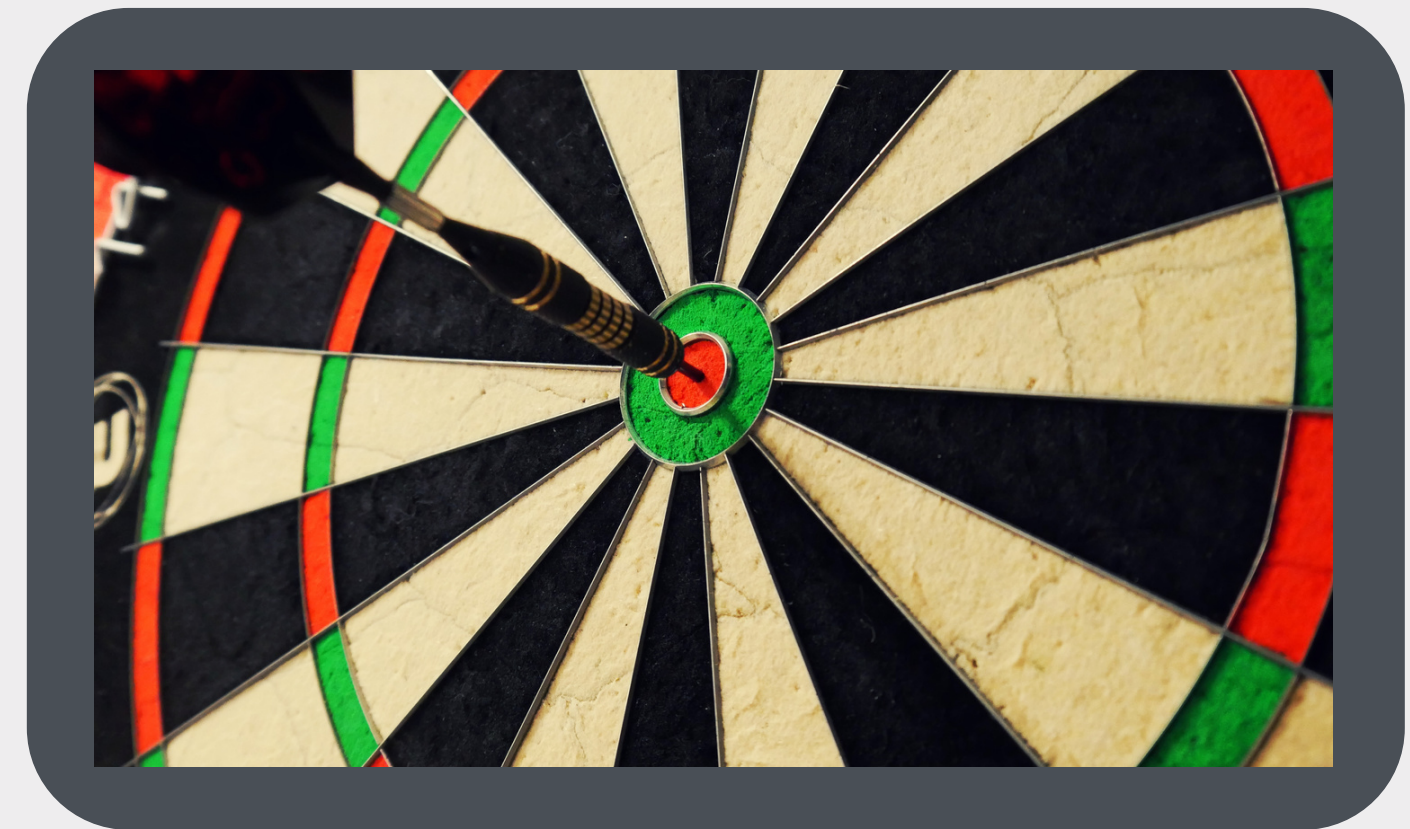
The appropriate optimization metric for a bookmaker is **accuracy**

When a bookmaker sets odds on a match, they either pick the favorite (i.e., winner) correctly, or they do not.

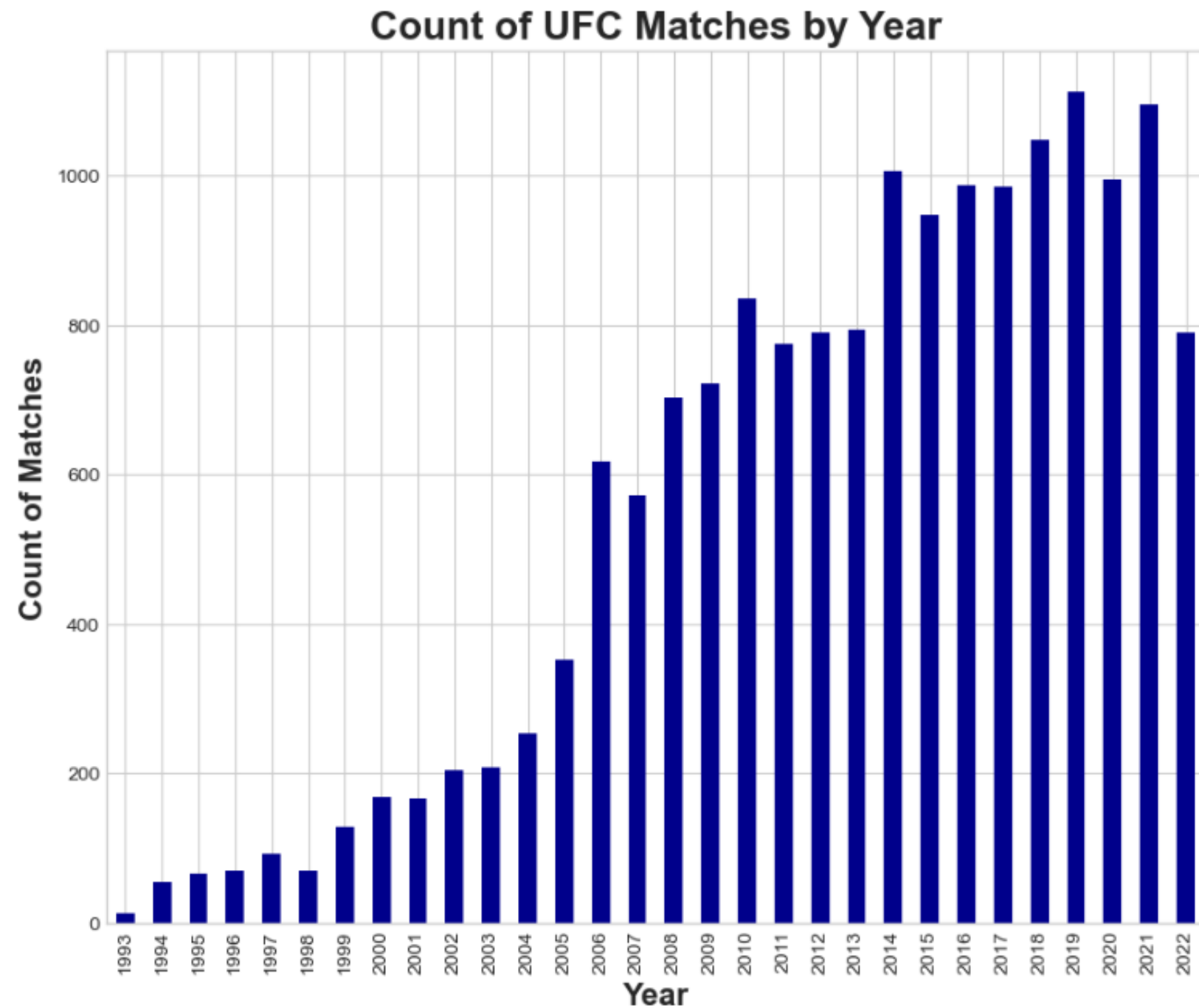
A **type 1 error** (false positive) would be predicting Fighter A to win, when in reality Fighter B wins.

A **type 2 error** (false negative) would be predicting Fighter B to lose, when in reality Fighter A loses.

Because there are only two fighters to choose from per match, there **is no difference in these cases**, therefore **accuracy** remains the proper metric.



The Data



The UFC has seen a significant increase in popularity since inception

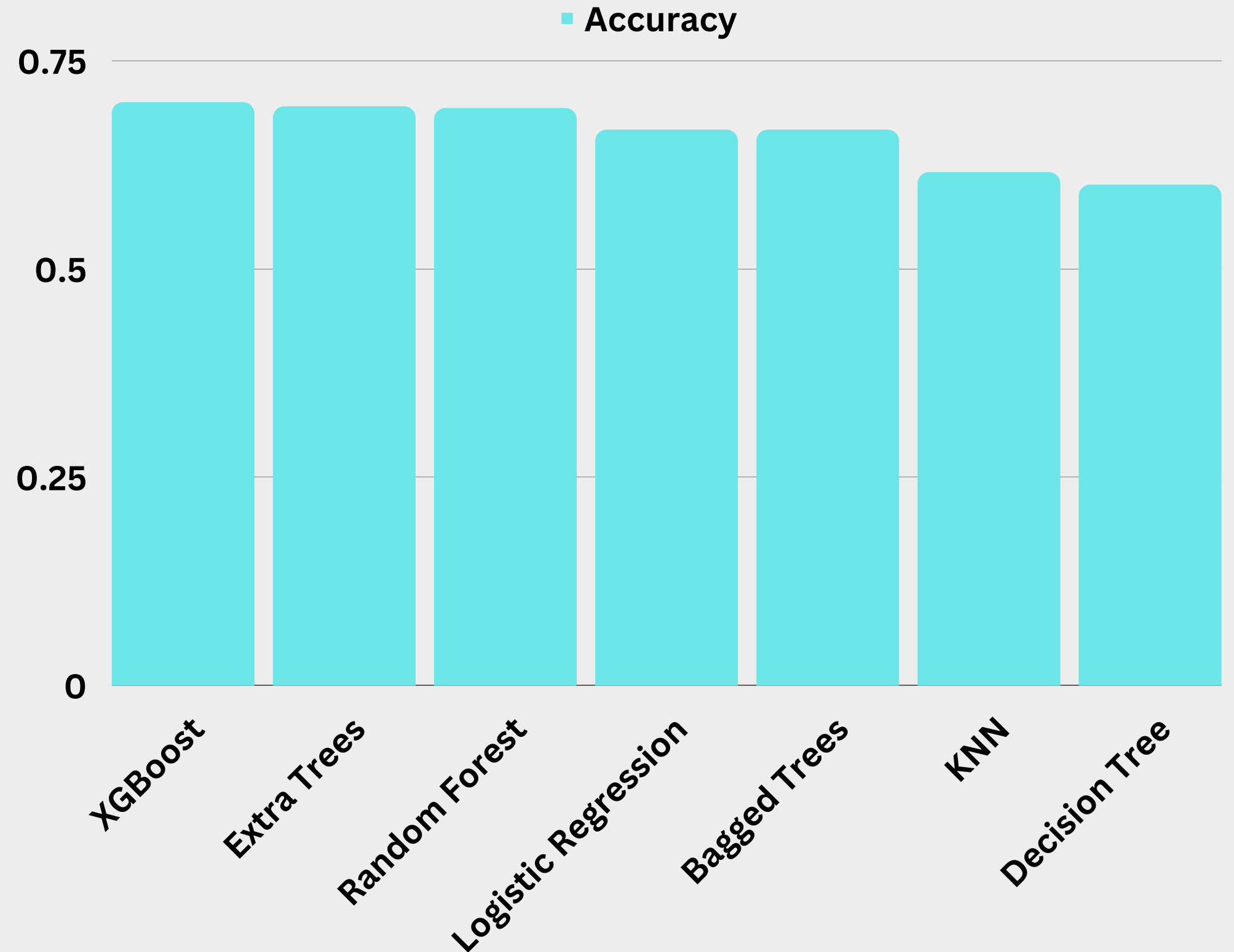
The data includes over **8,000 matches** (i.e., fights) which occurred over **19 years**.

The final data set contains over **450 individual features**, including:

- fighter **size metrics**,
- biographical data,
- **previous fights**, and
- **advanced statistics** which describe those fights.

Model Testing Results

Multiple models
were **tested** to
determine the
best performing.



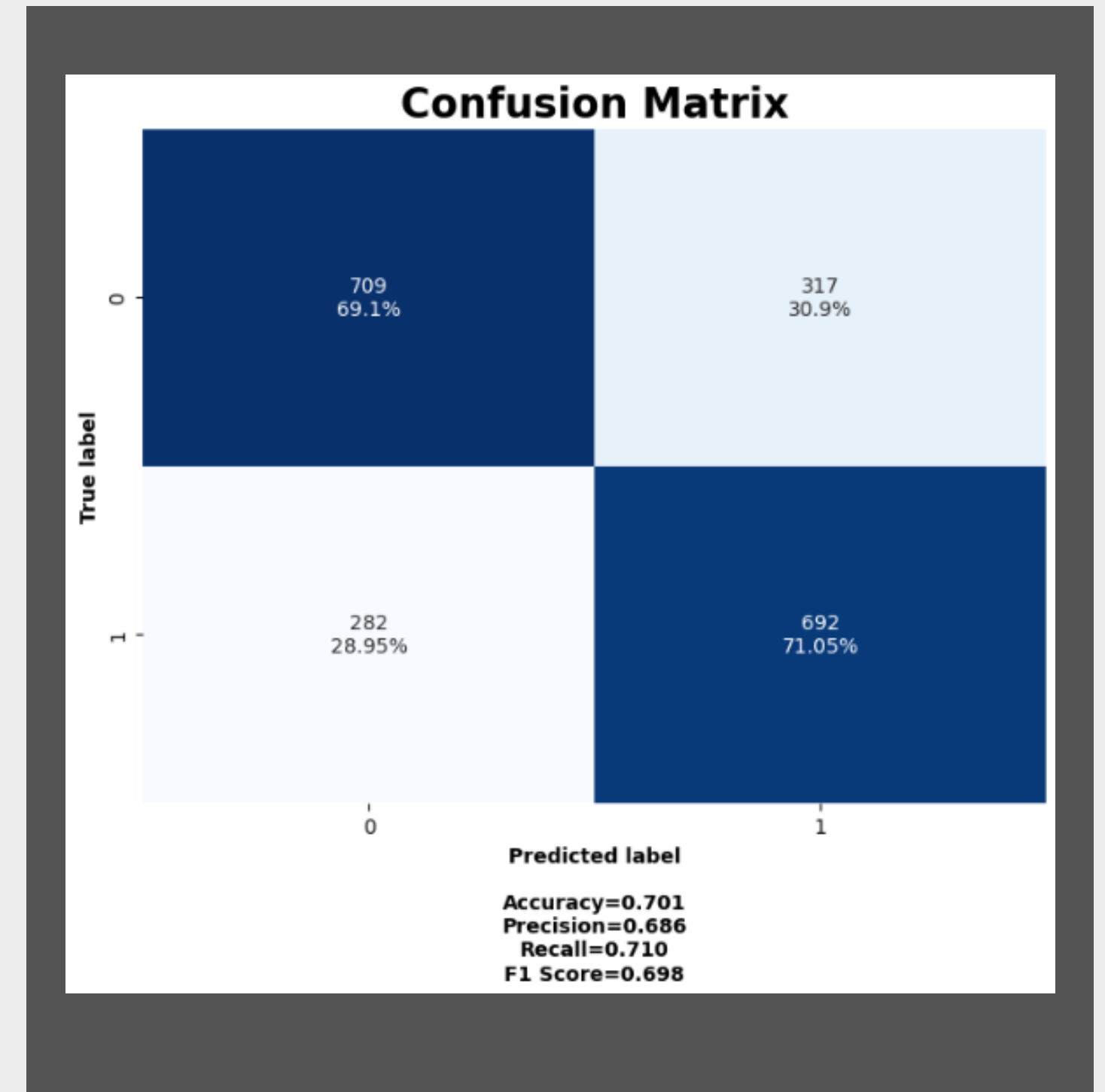
Final Model

XGBoost Model (Iteration #13)



The **final model** was an XGBoost model that achieved **70% accuracy**.

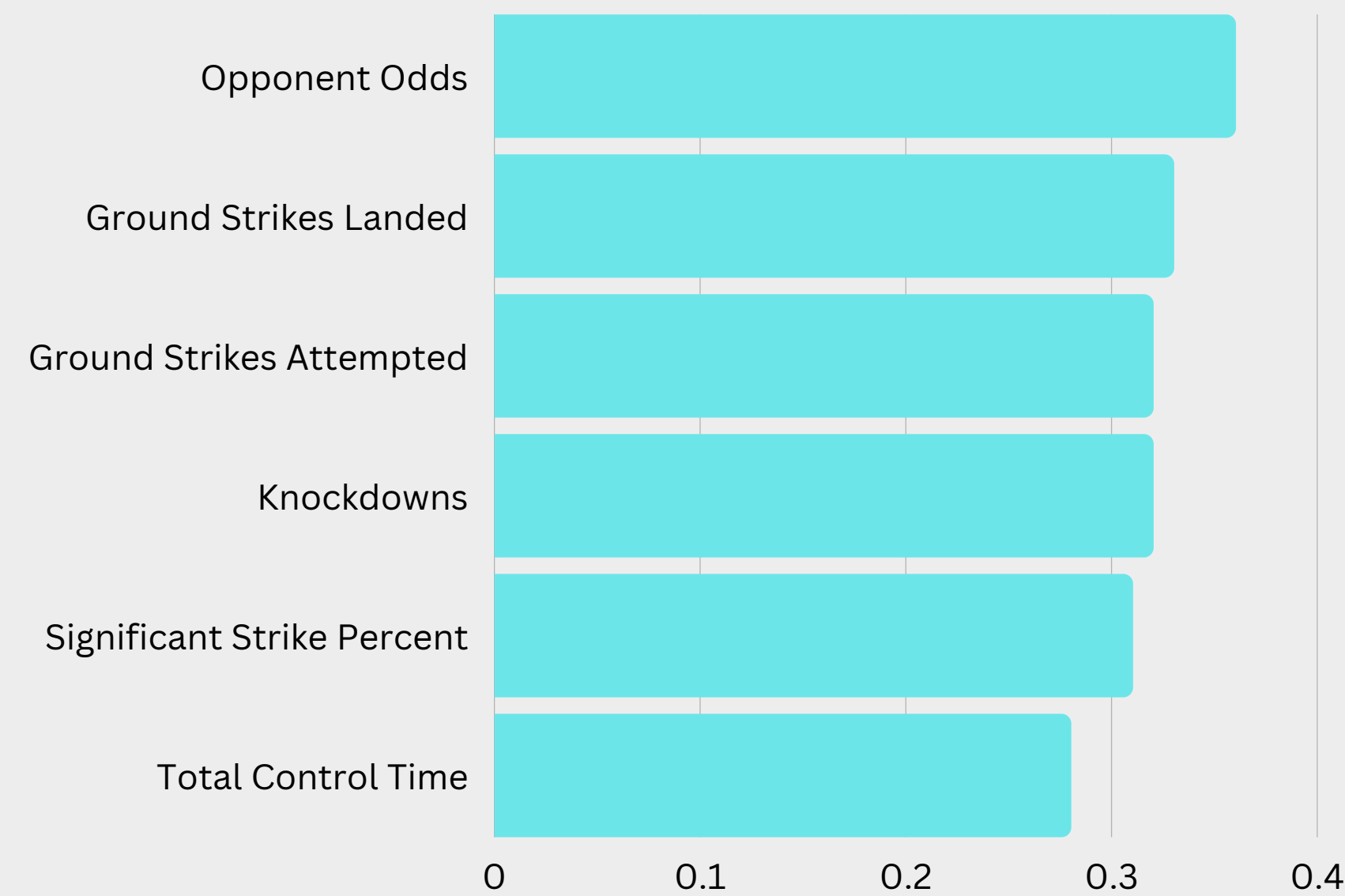
This was an approximate **10 percent increase** over the initial decision tree model.



Important Features

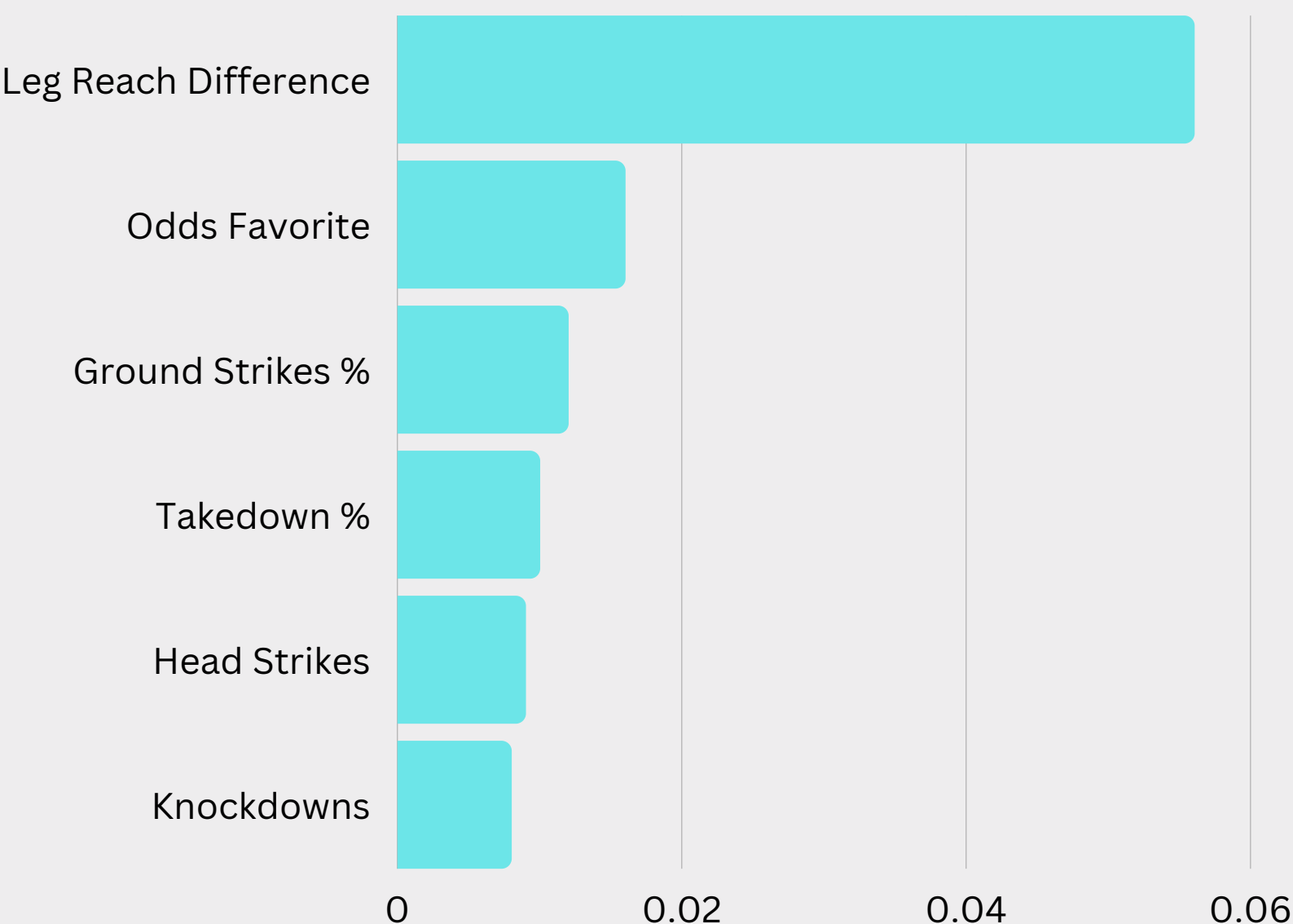
Feature Correlations with Wins

These were the features in the data that were the highest correlated with winning a match (fight).



Feature Importance

These were the features in the data that were the most important to the final model.



Conclusion

- The **final product** can be used by bookmakers to increase the accuracy with which they **predict winners** and **make betting lines**.
- This accuracy would **increase** both **revenue** and **profits** and give the bookmaker an **informational competitive advantage**.

This final application can:

- 1) **Predict** the winning martial artist,
- 2) **display odds** based on the final machine learning model, and
- 3) **depict the primary features** in the data that were most important to the model.

Select Event

Rodriguez vs Lemos

Select Fight

Neil Magny vs. Daniel Rodriguez

Predicted Winner: Daniel Rodriguez

Model Predicted Win Probabilities:

Neil Magny : 44.9%

Daniel Rodriguez : 55.1%


Selected UFC Event: Rodriguez vs Lemos

	Fighter #1	Fighter #2
0	Marina Rodriguez	Amanda Lemos
1	Neil Magny	Daniel Rodriguez
2	Chase Sherman	Josh Parisian
3	Tagir Ulanbekov	Nate Maness
4	Grant Dawson	Mark Madsen
5	Darrick Minner	Shayilan Nuerdanbieke
6	Miranda Maverick	Shanna Young
7	Mario Bautista	Benito Lopez
8	Polyana Viana	Jinh Yu Frey
9	Liudvik Sholinian	Johnny Munoz

UFC Fight Prediction

Choose a fight from the sidebar to see the prediction.

Neil Magny



Vegas Odds

-115

Odds-Implied Probability

53.5%

Height

75.0

↑ 2.0

Reach

80.0


↑ 6.0

Leg Reach

45.0

↑ 4.0

Daniel Rodriguez



Vegas Odds

-105

Odds-Implied Probability

51.2%

Height

73.0

↓ -2.0

Reach

74.0

↓ -6.0

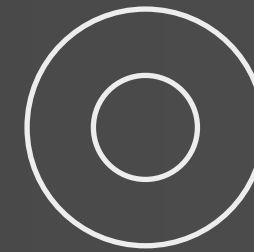
Leg Reach

41.0

↓ -4.0



THANK YOU



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