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 (aproximately) of the time .

Solution

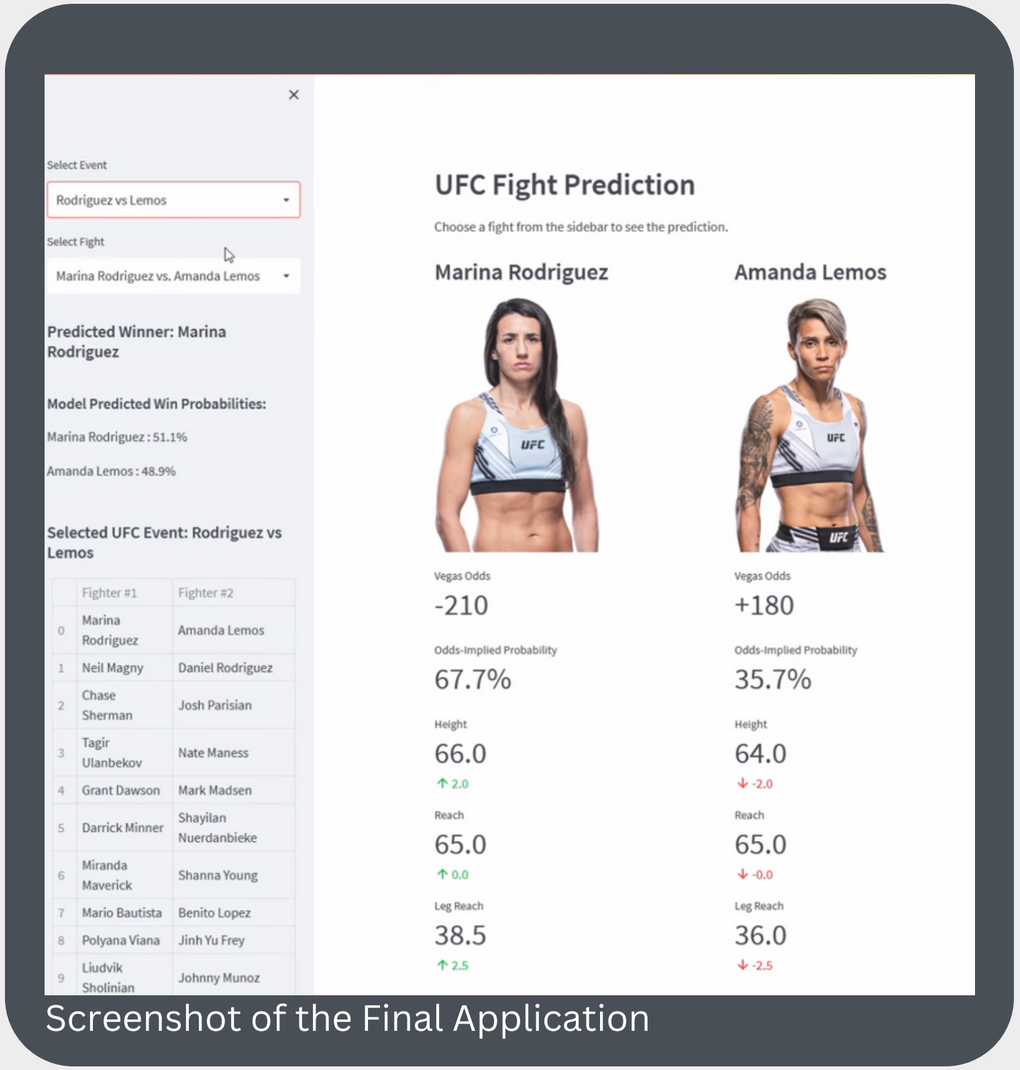
This project will increase these odds by creating an application which can model and predict the winner of individual fights and calculate model-predicted probabilities of who will win.

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.



Screenshot of the Final Application

Stakeholder Metrics

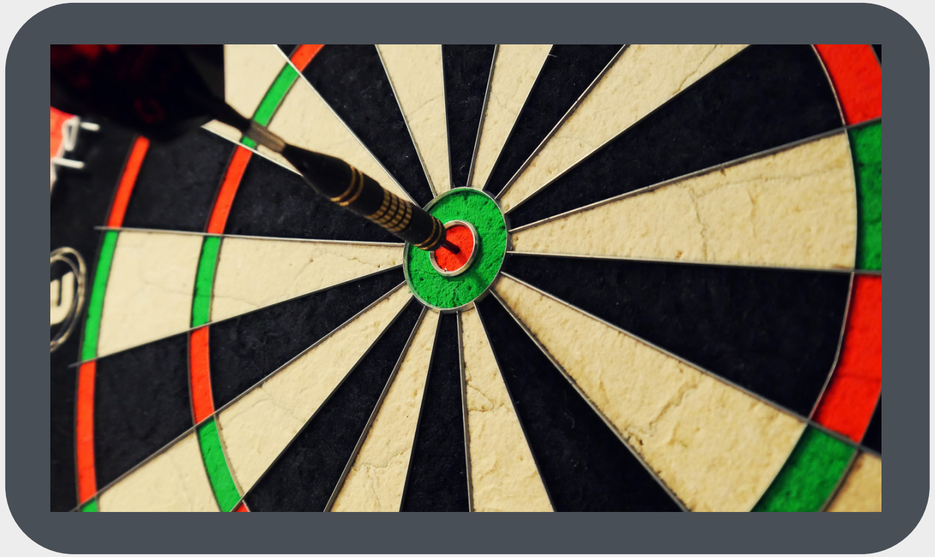
The appropriate optimization metric for a bookmaker is **accuracy**

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

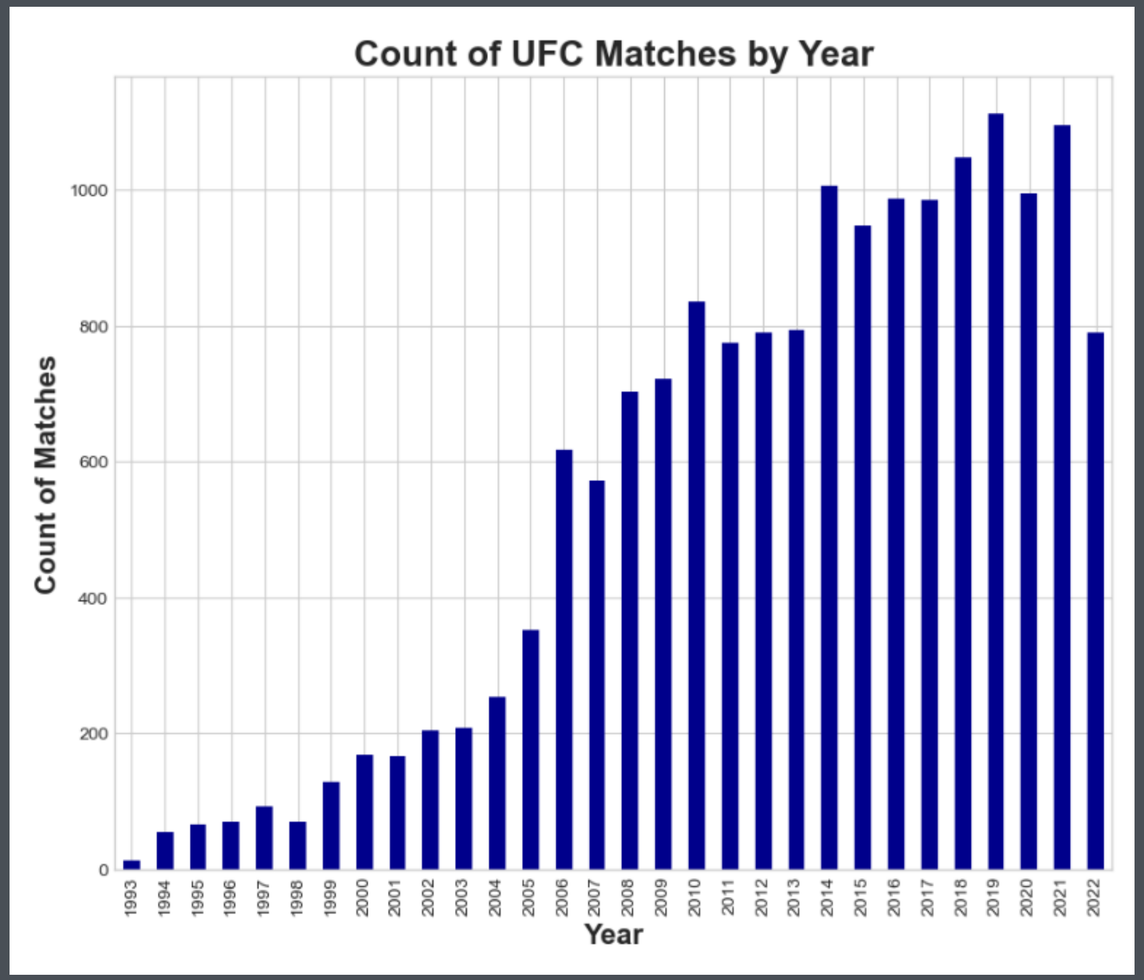
A **type 1 error** (false positive) would be predicting Fighter A to win, when in reality Fighter B wins.

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

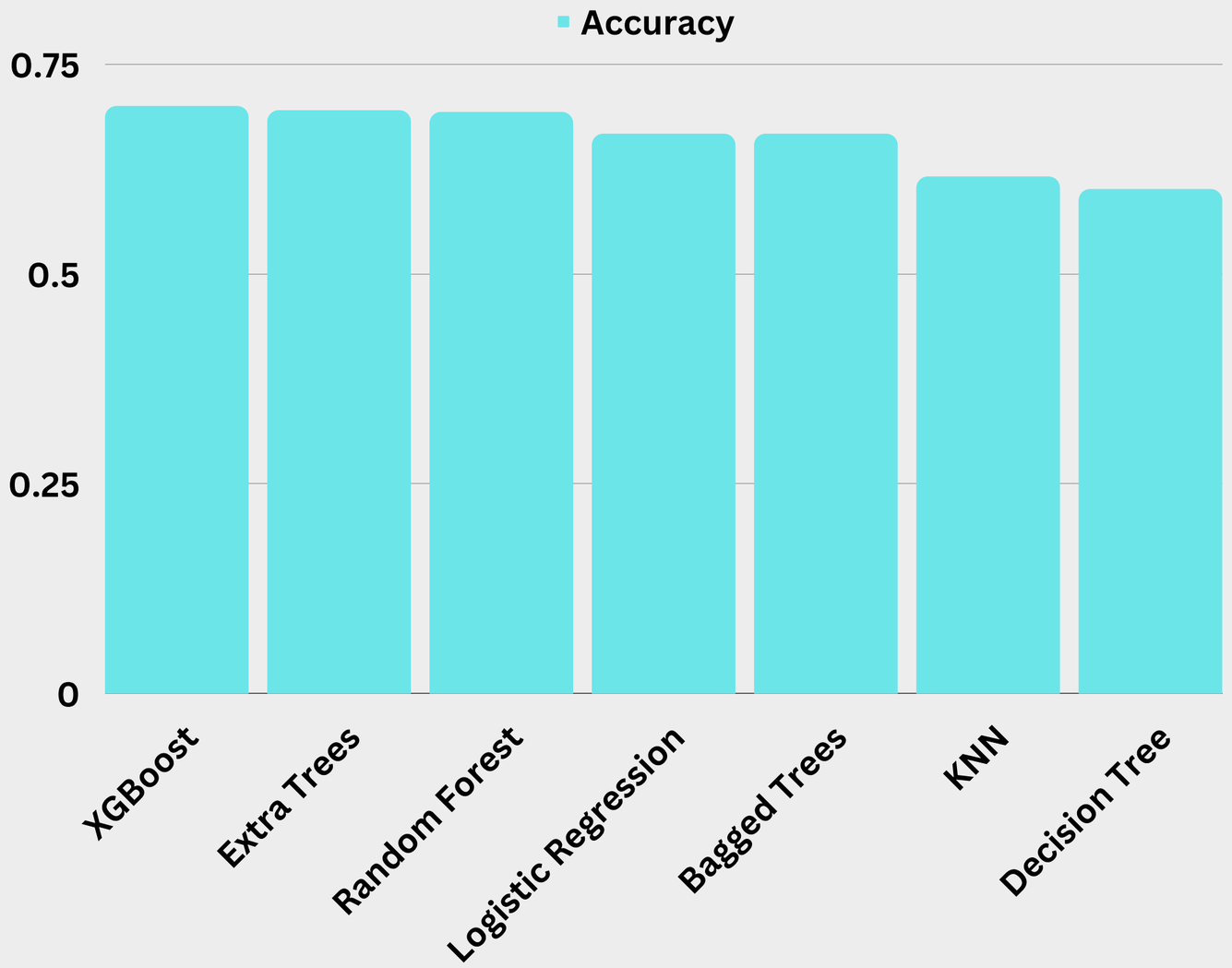
The data includes over **8,000 matches** (i.e., fights) which occurred over **19 years.**

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.**

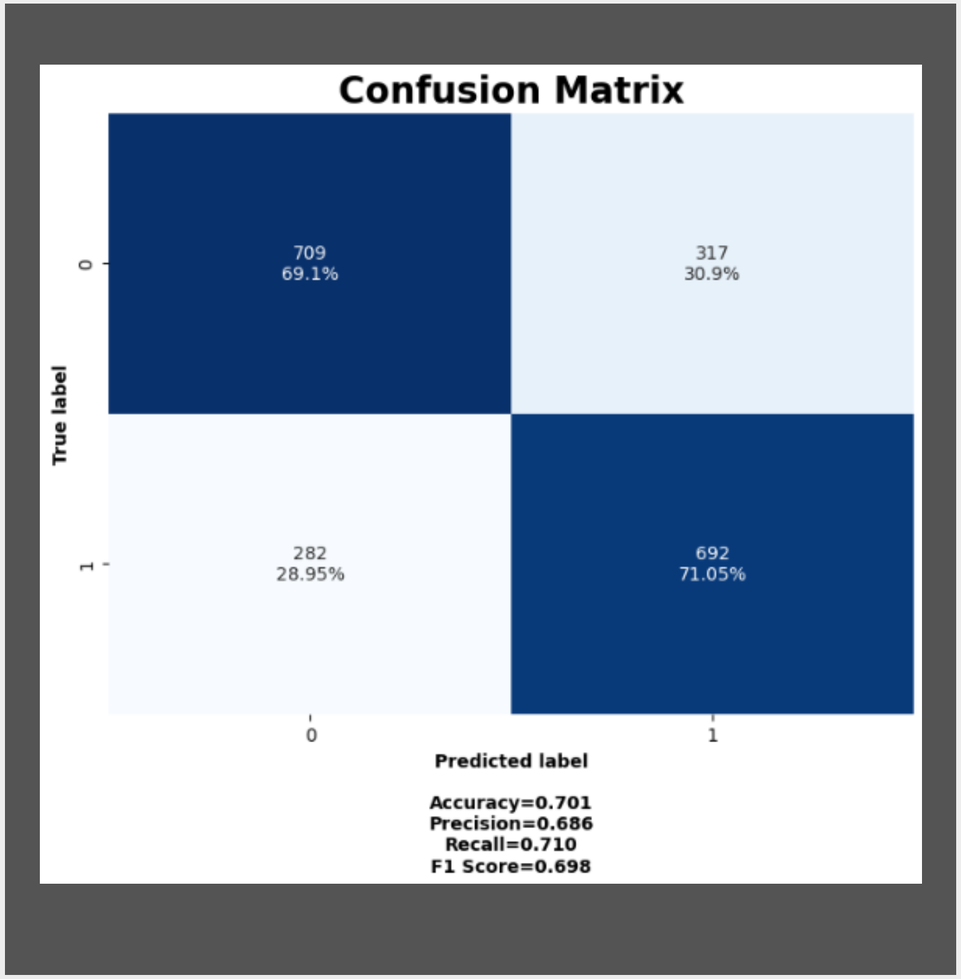


Final Model

XGBoost Model (Iteration #13)

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

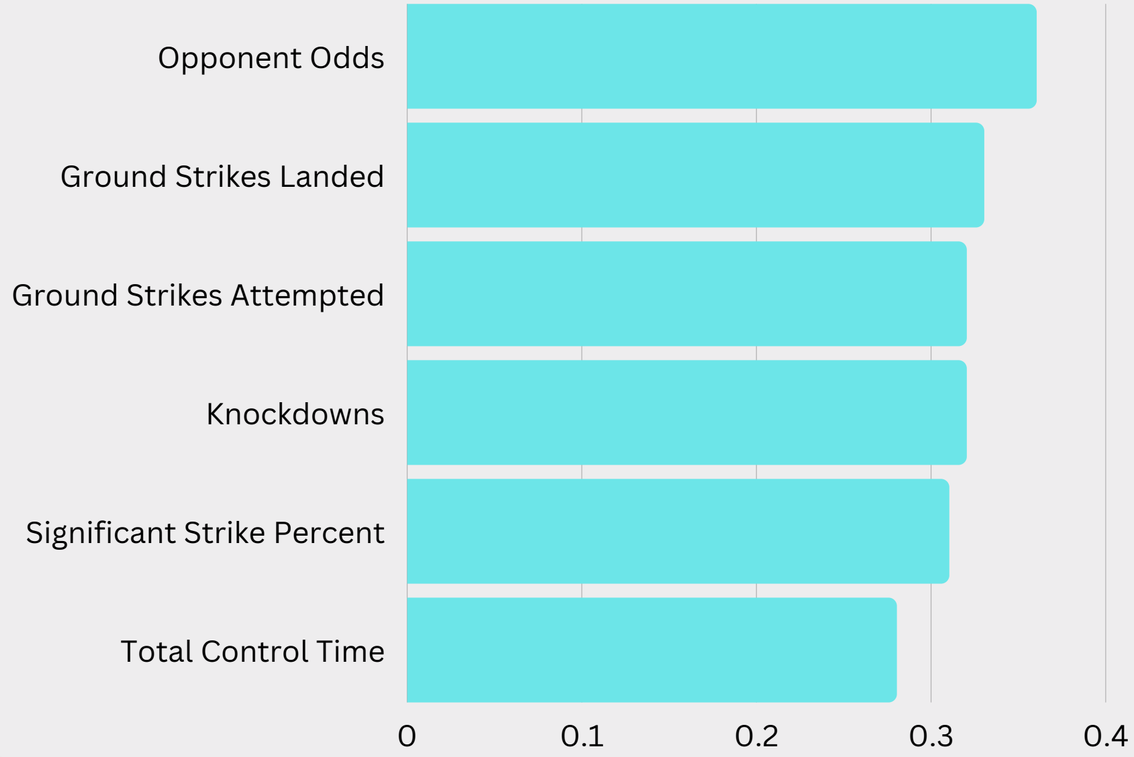
This was an approximate **10 percent increase** over the initial decision tree model.



Important Features

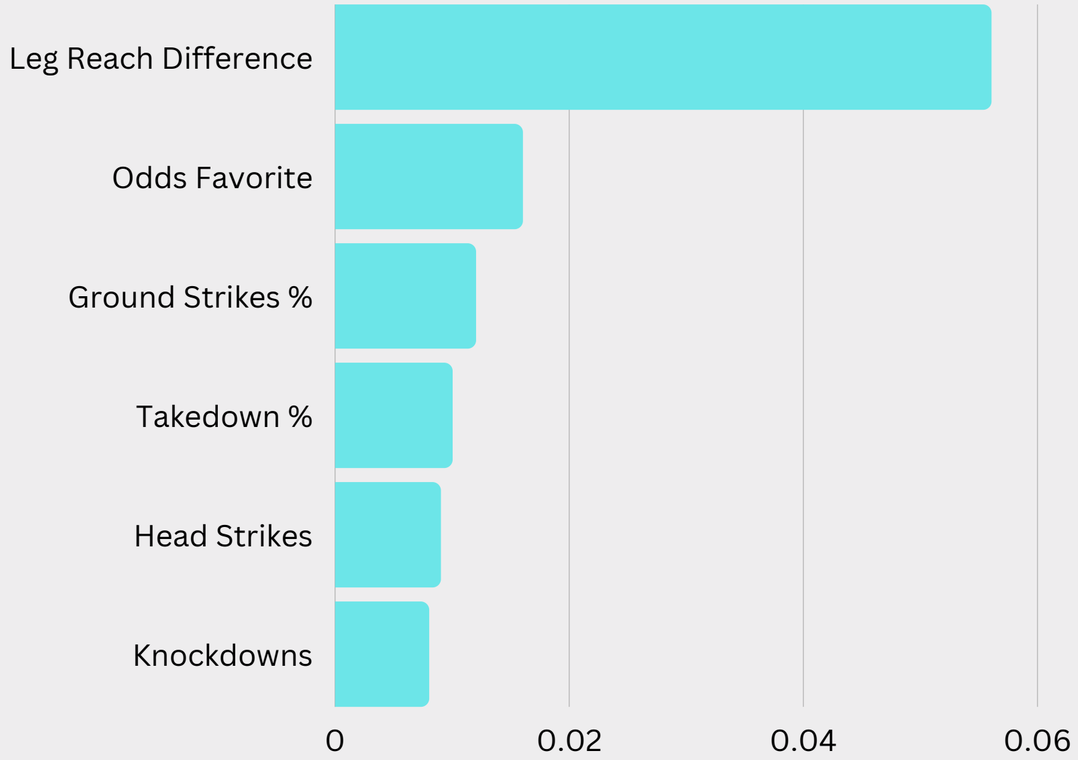
Feature Correlations with Wins

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.



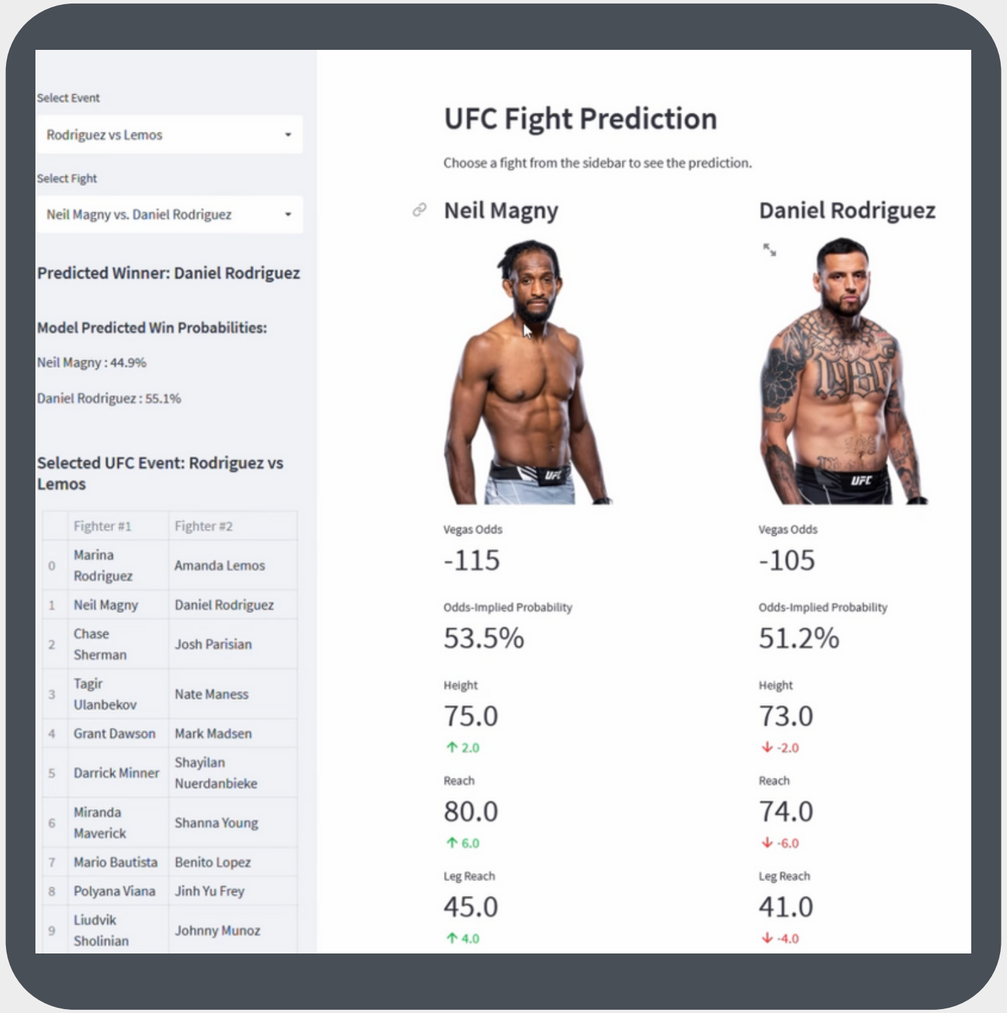
Conclusion

- 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**.

<u>This final application can:</u>

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.



THANK YOU

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