

Can I Predict an F1 Winner?

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Asking the Big Question

Formula 1 isn't just speed; it's strategy, pit stops, weather, and surprise DNFs.

Can machine learning predict a winner based on patterns in the data?

Goal: Use historical data to simulate race outcomes and make it visual.



Defining My Role

I acted as the full-stack project owner, from data scraping to model deployment.

Tasks included:



Gathering the Data

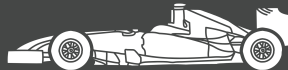
- Source: Ergast API (2018–2024 seasons)
- Extracted:



Race results



Drivers



Constructors



Circuits

- Created 15,000+ driver-race rows after merging & cleaning

Designing the Right Features

Engineered 5 key features:



Grid Position:
Starting
advantage



Average Finish:
Season
consistency



Win Ratio:
Recent form



**Constructor Avg.
Points:**
Car/team strength



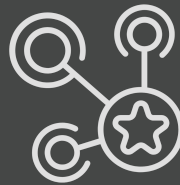
**Circuit-Specific
History:**
Track familiarity

Training the Model

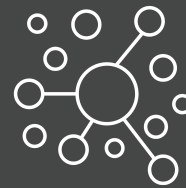
Model: Random Forest Classifier



Handles nonlinear
interactions



Built-in feature
importance



Robust to outliers

- Achieved approx. 85% accuracy
- Top predictors: Grid position, constructor stats, circuit history

Making It Interactive

The image shows a web application titled "F1 Race Winner Predictor" running on a browser at localhost:8501. The interface is dark-themed and features a sidebar on the left for input and a main content area for the prediction results. Annotations in dashed boxes highlight key interactive elements:

- Select driver + race:** Points to the "Race Info" section in the sidebar, which includes a "Select Circuit" dropdown (set to "Shanghai") and a "Weather" dropdown (set to "Dry"). Below this is the "Driver Stats" section with a "Select Driver" dropdown (set to "Lewis Hamilton") and three horizontal sliders for "Qualifying Position" (set to 5), "Average Finish This Season" (set to 2.91), and "Season Win Ratio" (set to 0.09).
- Minimal, intuitive design:** Points to the top navigation bar, which includes a "Deploy" button and a "Finish update" link.
- Predicts win probability:** Points to the "Prediction" section in the main content area, which displays the "Driver: Lewis Hamilton", "Circuit: Shanghai", and a "Predicted Probability of Winning: 20.38%". Below this is a green bar with the text "Low chance of winning".
- Real-time output with visual feedback:** Points to the "Predicted Probability of Winning" section, which shows the percentage value and a corresponding visual bar.

F1 Race Winner Predictor

Prediction

Driver: Lewis Hamilton

Circuit: Shanghai

Predicted Probability of Winning: 20.38%

Low chance of winning

Reflecting on the Process

Key Takeaways

Feature engineering is 50% of model success

Prediction \neq certainty (rookies, weather, etc.)

Streamlit makes deployment accessible

Building explainable tools > chasing perfect accuracy