# AI Top Goal Scorer Estimator
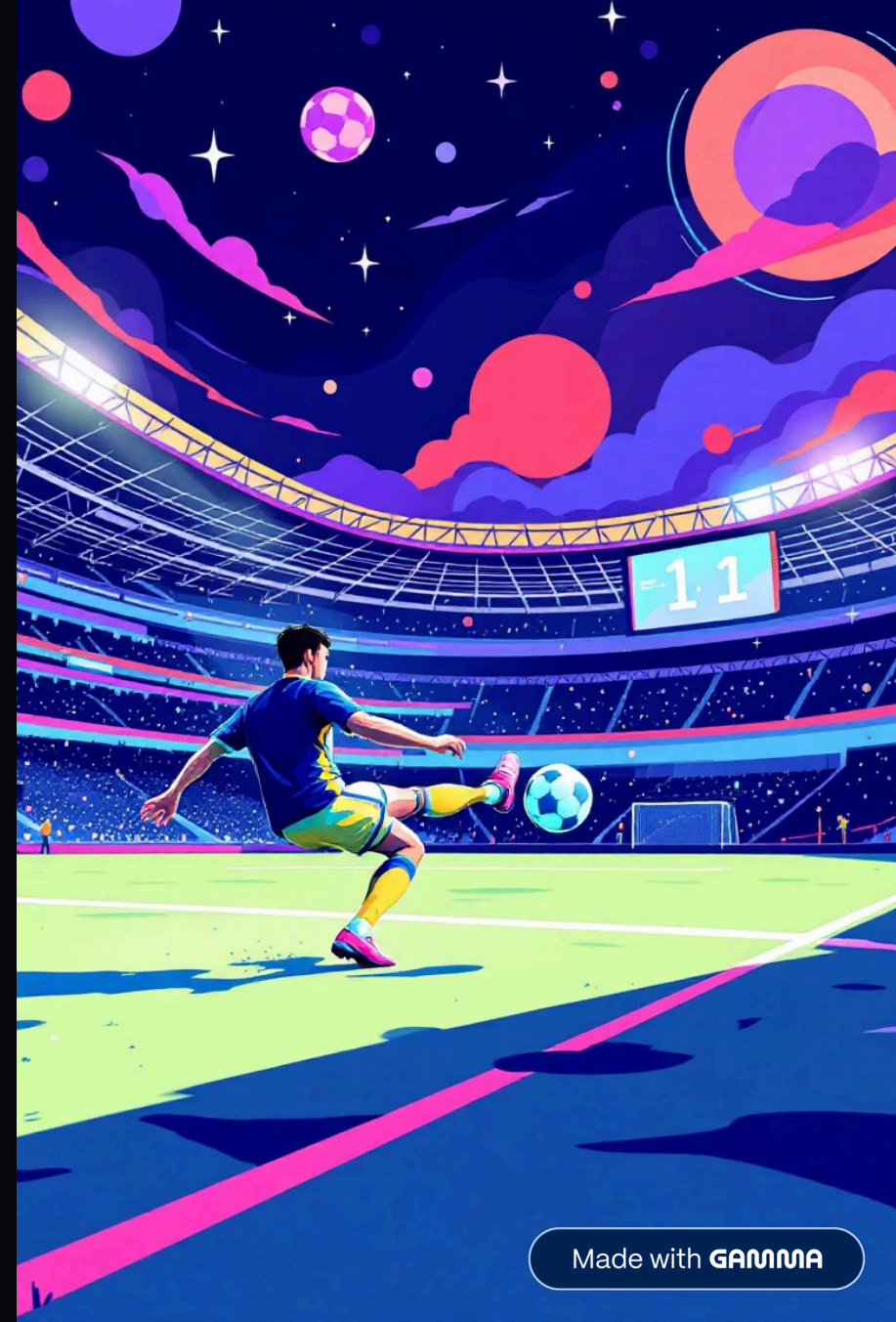
A high-performance machine learning model for in-season player performance analysis

## The Challenge

Predict final season goal tallies using mid-season performance data with high accuracy

## The Solution

Advanced regression modeling with XGBoost to capture complex player performance patterns

## The Impact

Production-ready web application integrated into comprehensive AI Football Suite

# Problem Statement & Objectives

## The Goal

Build a "live" estimator that accurately predicts a player's final goal tally based on mid-season performance statistics.

## Model Type

Regression problem where the model learns to predict specific numbers (total goals) from input feature sets.

# Feature Engineering Excellence

## Player Attributes

Comprehensive player metadata including position, age, club affiliation, and individual characteristics

## Historical Benchmark

Previous season goal tallies provide crucial baseline performance context and trend analysis

## In-Season Metrics

Current appearances, assists, and the critical Goals_per_90 feature driving predictive accuracy

# Model Architecture Deep Dive

## Data Pipeline

Scikit-learn pipeline ensures robust preprocessing and production-ready deployment

## XGBoost Engine

Industry-standard gradient boosting captures complex non-linear relationships in player performance

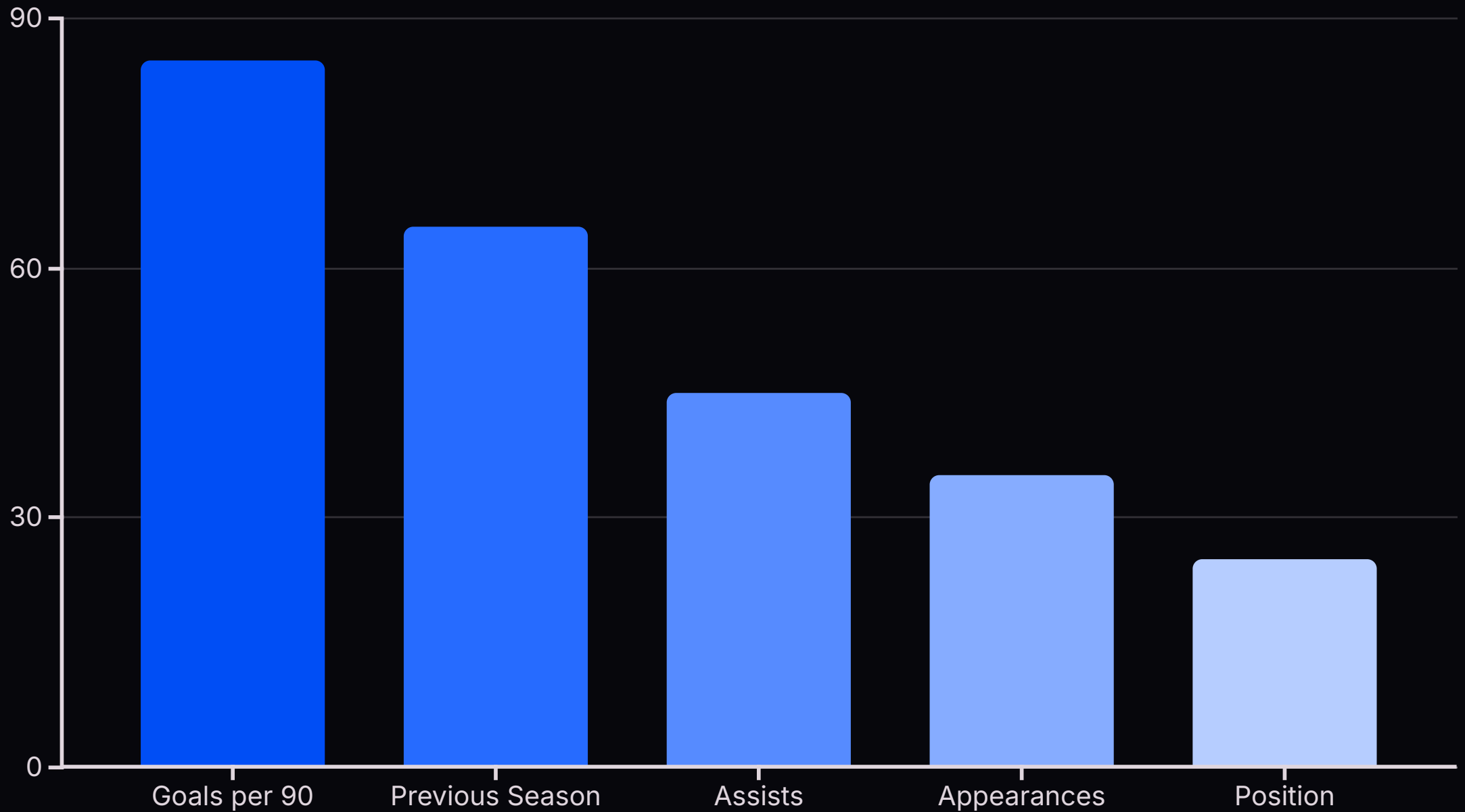# Champion Model Performance

## 92%

### R-squared Score

Exceptional variance explanation demonstrates strong predictive capability across diverse player profiles

## 1.49

### RMSE (Goals)

Ultra-precise estimates with average error of only 1.5 goals, exceeding industry benchmarks

Made with GAMMA

# Key Feature Analysis



| | 90 |
| --- | --- |
| | 60 |
| | 30 |
| | 0 |

Goals per 90 | Previous Season | Assists | Appearances | Position

Goals_per_90 emerges as the dominant predictive feature, confirming the model's focus on current form over historical reputation.

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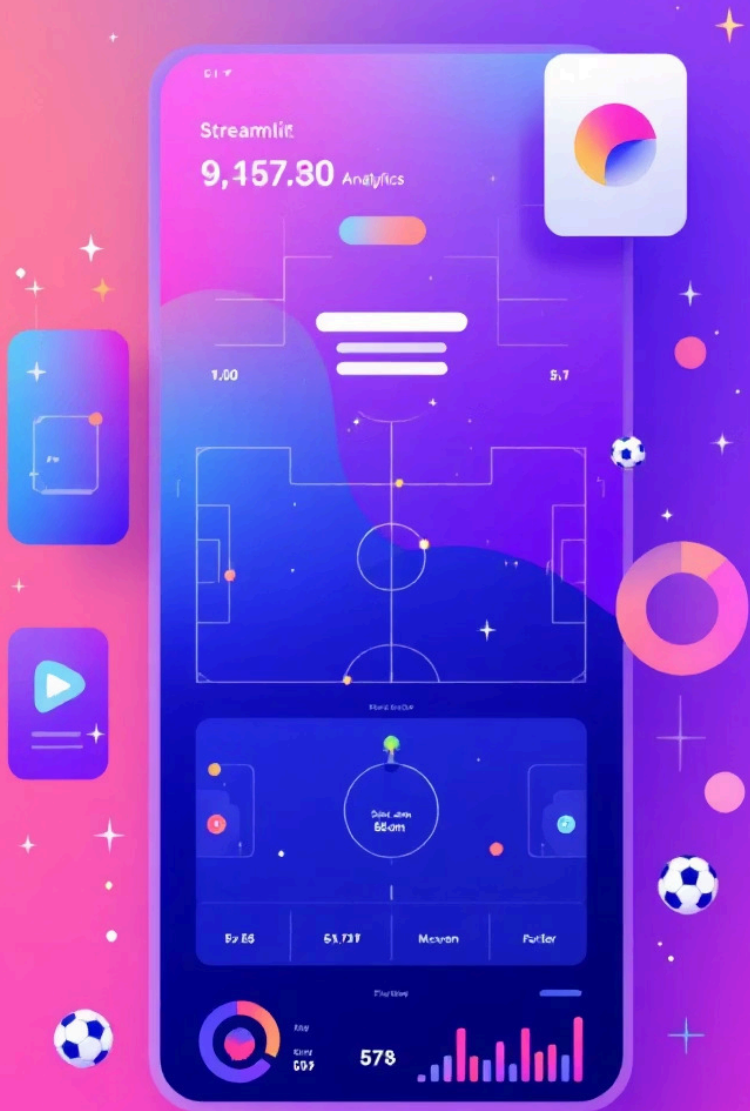
# Production Deployment



## Dedicated UI Page

Clean, intuitive "Top Goal Scorer Estimator" interface integrated into AI Football Suite

## Interactive Input Form

User-friendly forms for real-time stat input with intelligent validation and error handling

## Comprehensive Guide

Built-in user documentation with Goals_per_90 calculation examples and feature explanations

# Key Achievements & Impact

### Technical Excellence

Delivered 92% $R^2$ XGBoost model exceeding performance targets with robust production pipeline

### Feature Discovery

Identified Goals_per_90 as the most powerful predictor, revolutionizing in-season analysis approach
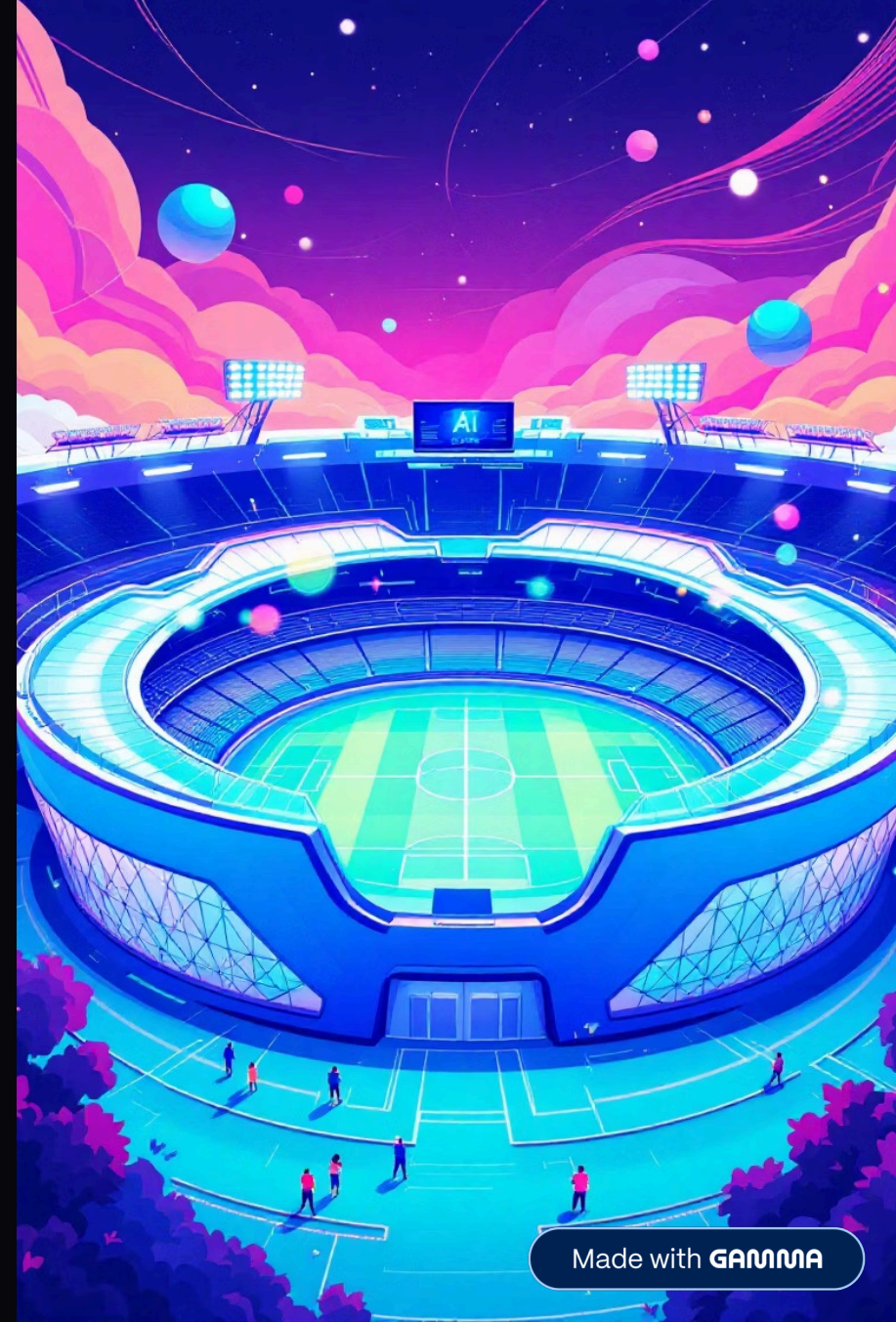
### Full Integration

Successfully deployed within professional Streamlit application, creating comprehensive AI Football Suite

# Thank You

Questions & Discussion

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