

# Project Proposal: Fantasy Football Prediction System

Deban Kumar Shahi (deban.shahi@students.iiit.ac.in),  
Piyush Priy (piyush.priy@students.iiit.ac.in),  
Sanket Adlak (sanket.adlak@students.iiit.ac.in),  
Priyank Nagarnaik (sanket.adlak@students.iiit.ac.in)

## 1 Introduction

Fantasy football is a globally popular activity where users manage virtual teams composed of real-life players, earning points based on the performance of the game. The English Premier League's Fantasy Premier League (FPL) attracts millions of participants, reflecting the competitive nature of the game. This proposal outlines a project to develop a data-driven prediction system that leverages machine learning to forecast player performance and optimize team selection under FPL constraints. The system will use historical performance data and fixture context to generate weekly projections and recommend optimal lineups, thus reducing human biases in team selection.

## 2 Motivation

Decisions in fantasy football are often influenced by personal biases and subjective preferences, such as favoring popular players or adhering to team loyalties. These biases can lead to suboptimal team performance over a season. A data-driven approach mitigates such issues by using statistical models to objectively evaluate player performance based on historical trends and contextual factors (e.g., fixture difficulty, form). By employing machine learning techniques, the system aims to provide accurate, unbiased predictions that can empower fantasy managers to make more informed decisions and improve their competitive edge.

## 3 Use Case & Stakeholders

**Use Case:** Fantasy managers will use a web-based interface to access the system before each game week. The tool will present predicted player performances and recommend optimal lineups based on robust statistical analysis. This will aid users in selecting transfers and finalizing their starting teams, ensuring adherence to FPL's rules while maximizing projected points.

### Stakeholders:

- **Fantasy Football Managers:** End-users who benefit from objective, data-driven insights to enhance team performance.
- **Data Analysts/Developers:** Researchers and professionals interested in sports analytics and machine learning applications.
- **Sports Enthusiasts:** Members of the broader fantasy community who engage in discussions and analyses based on the system's recommendations.

## 4 Related Works

Prior research has explored a variety of machine learning techniques in fantasy sports. Parikh (2014) demonstrated that position-specific models, which analyze micro-level statistics, can outperform traditional heuristic methods in fantasy football analytics. Similarly, Sugar and Swenson (2015) compared regression models (e.g., ridge regression, Bayesian ridge, and elastic net) for predicting fantasy points, finding that tailored models for specific positions often yield superior accuracy.

Gupta (2017) employed time-series modeling using recurrent neural networks to predict player performance in the Fantasy Premier League, subsequently using linear programming to assemble an optimal team. Matthews, Ramchurn, and Chalkiadakis (2013) addressed the team selection problem with a reinforcement learning approach, achieving competitive results against millions of FPL participants. More recently, Bonello et al. (2019) integrated multi-stream data—including historical performance and external sentiment—to enhance prediction accuracy, demonstrating significant improvements over traditional methods.

These studies provide a solid foundation for our approach, which will integrate best practices from regression analysis and optimization algorithms, and further refine predictions through position-specific modeling.

## 5 References

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