College Player Rating Using Weighted Statistics Scaling

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ABSTRACT

Sports fans indulge heavily in fantasy sports. The estimated global fantasy sports market in 2021 is $**22.3 Billion**. However, there is no reliable decision support for fans to engage in college football fantasy games. This study aims to develop a framework to provide team and player ratings, a key decision input for fantasy sports, across different positions in college football using players' historical statistics.

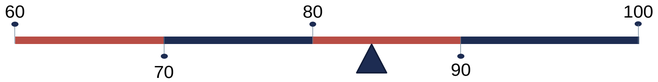

Fig 1. Player WSS score scaled from 60 to 100

We propose a **Weighted Statistics Scaling (WSS)** method which computes player and team ratings.

INTRODUCTION

Most online platforms use statistics to compare performances of players in a fantasy setting. However, these statistical models tend to be simplistic. The multidimensional and complex nature of sports data requires a more rigorous data driven framework.

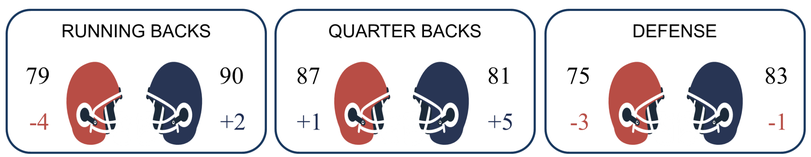

Fig 2. Player Ratings at different positions

The WSS algorithm evaluates players based on their game performances.

Research question addressed:

- What are the important player performance variables for determining college football player ratings?

LITERATURE REVIEW

- ESPN's SPI Ratings create composite team and player ratings to calculate win probability. Credit is distributed to players according to their contribution towards scoring plays or scores allowed in a game.
- ELO Ratings iteratively update ratings at team and player level after each game.
- The drawback of these approaches is their inability to account for all player positions. The WSS approach addresses this problem and computes ratings for multiple positions.

RATING METHODOLOGY

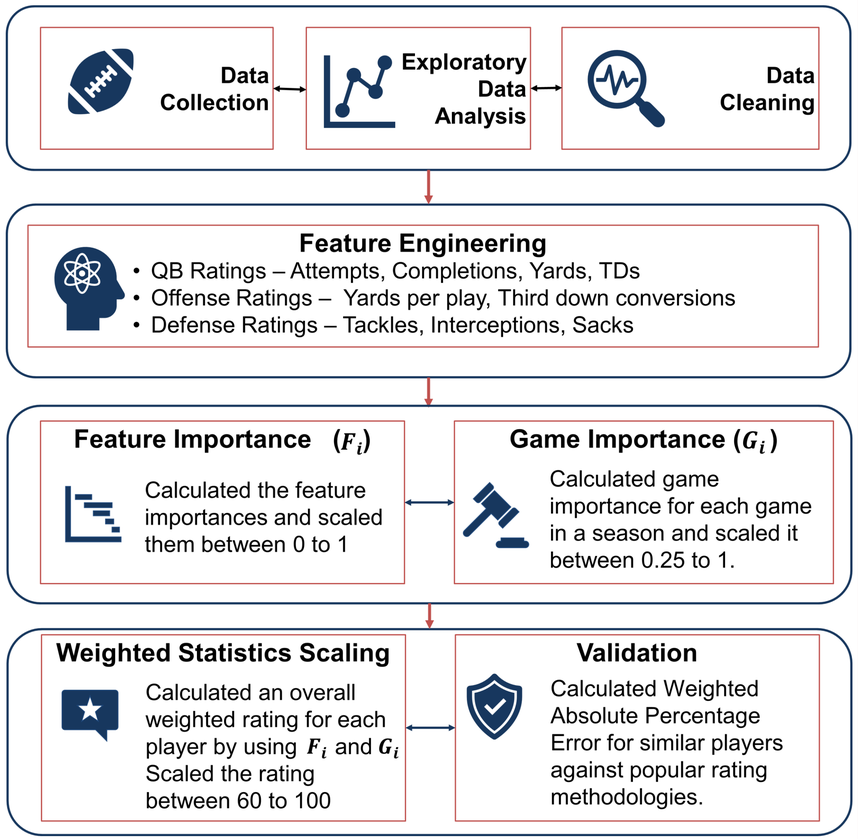

Fig 3. Project Workflow

WSS QB RATING CALCULATION

Let P be a quarter back and S_i is the set of important statistics in a game that affect his rating where $i = \{1,2,3..f\}$. F_i are the scaled importances of these features.

G_j is the scaled importance of that game in this season where j ranges from 1 to N (number of games P has played this season).

$$FS_j = \left[\sum_{i=1}^{f} Fi * Si\right]$$ is calculated for each game j

$$WSS = \left[\sum_{j=1}^{N} FSj * Gj\right]$$ is calculated for player P and scaled between 60 to 100

TOP THREE FEATURES AND VALIDATION

Running Backs		Quarter Backs		Defense	
Rushing Attempts	+	Interceptions	−	Passes Broken	+
Rushing Touchdowns	+	Attempts	+	Sack Yards	+
Yards Per Attempt	+	Touchdowns	+	Intercepted Yards	+

A sample comparison of WSS Quarter Back ratings with ESPN's QBR resulted in **Weighted Absolute Percentage Error of 9.2%.**

The **(+)** sign indicates the feature impacts the rating positively and features with **(-)** sign affect the ratings negatively.

POTENTIAL BUSINESS APPLICATIONS

According to a study done by Intel, **75%** of fans wanted detailed real-time data to create better fantasy teams. The WSS approach can be used to improve keys sports functionality and decision support for fans.

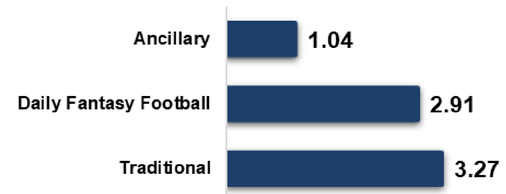

Fig 4. Revenue (Billion) USD across fantasy sports segments

CONCLUSIONS & SCOPE

The WSS model was evaluated using Purdue, player and team, historical data. The initial results are promising, and further research is required.

TECHNOLOGIES USED

mongoDB. python™ GitLab