Assigning Football Players' Field Positions

Project Proposal: CSE343 Machine Learning

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Abstract

In soccer, predicting a player's future performance and market value is crucial for effective team management. This project aims to address this issue by developing a tool that can predict player performance and guide decision-making. Our approach involves reviewing existing work, analyzing a large dataset, implementing predictive models, and developing a tool that empowers football stakeholders to make informed decisions, ultimately increasing chances of team's success on the field.

1 Motivation

Accurately predicting a soccer player's future performance and market value is a significant challenge in football, often leading to underperformance when teams acquire players who don't fit well with their existing squad. Our project aims to develop a tool that forecasts player performance and value, assisting soccer clubs with informed recruitment decisions, optimized squad rotation, and tailored training programs.

By analyzing a comprehensive dataset, it supports scouts in identifying emerging talent and helps fantasy soccer enthusiasts make better choices. Ultimately, this project provides valuable data-driven insights that improve decision-making and maximize team success.

2 Related Works

- **Research Work-1:** The paper proposes PlayeRank, a machine learning-based framework for evaluating and ranking soccer players through performance data analysis revealing detailed insights into player abilities and versatility.
- **Research Work-2:** The paper presents a deep learning method for predicting football player performance developing a multilayer perceptron model with 87.2% accuracy among 119 pricing categories.
- **Research Work-3:** The paper presents a machine learning model to predict soccer player transfer values using historical performance and market trends, aimed at improving financial decision-making.

3 Timeline

- **FIFA 23 Complete Player Dataset:** We will use this dataset (2GB) from Kaggle by Stefano Leone to analyze player performance and predict future potential. It includes detailed player statistics from FIFA 23, like skill ratings, physical stats agility, aggression, balance, etc.
- **Phases:** We plan to divide our work into two phases, that is before and after Mid Semester Exams.
  - † **Phase-1**: Data Preprocessing and Visualisation. Extracting relevant information from the dataset and Implementing Models.
  - † **Phase-2**: Improving Models by Evaluation. Ablation Study and Formalization of results.

4 Individual Tasks

Each project phase will have an equal distribution of our tasks, which we will meticulously record in our reports.

5 Final Outcome

We will model real-world problems, design and implement a complete machine-learning solution, and evaluate model performance. The project will create a tool to predict soccer players' performance, aiding clubs in recruitment, team formation, and player development. This tool will support financial decisions, enhance scouting, improve fantasy soccer strategies, and promote data-driven practices in football. It will help clubs, players, and coaching staff make better decisions to maximize team success.