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Critical Report CSE424

Paper Title: Machine Learning Modeling to Evaluate the Value of Football Players

Paper Link: https://arxiv.org/ftp/arxiv/papers/2207/2207.11361.pdf

1. Summary

1.1 Motivation

Football, or soccer, is one of the most widely followed and lucrative sports in the world, with billions of supporters. Because of this, it is essential for clubs to comprehend and fairly evaluate the worth of football players in order to make judgments on player pay, transfers, and roster composition. Although there are conventional approaches to player valuation, there is a chance to investigate more advanced techniques due to the ongoing advancements in technology, especially in the field of machine learning (ML). The goal of this project is to use machine learning (ML) techniques to create a new approach to assessing player worth in the football market, which will eventually help football teams make decisions.

1.2 Contribution

This research offers the football community and the sports business in general a number of noteworthy contributions. First of all, it presents a novel technique for determining a player's value by utilizing player salary as a stand-in, providing a useful and understandable method for determining player value. Second, the paper shows creativity in model selection by using the

Random Forest method, a kind of ensemble machine learning model that may not have been investigated in this context before. Finally, the creation of predictive models makes it possible to estimate player pay based on particular traits, giving football teams useful instruments for figuring out player market worth and compensation.

1.3 Methodology

The study gathers player data from reputable football websites, including wages and performance metrics. Using the Random Forest algorithm, predictive models are built to estimate player wages, considering factors like age, position, and achievements. Feature importance analysis reveals key factors influencing player pay. The study's findings offer insights into player value in the football market.

1.4 Conclusion

In conclusion, this study presents a brand-new machine learning-based method for determining a player's value in the football market. The research provides useful tools for evaluating player wages and comprehending player market worth by using player salaries as a proxy and using the Random Forest method. Notwithstanding many drawbacks, including data limits, the research offers insightful information to the football sector, highlighting the need of sophisticated analytical techniques for enhancing football clubs' decision-making processes.

2. Limitations

2.1 First Limitation

Limited Scope of Features: The analysis could be missing certain key details that affect market value and player wages. For example, the research does not account for variables that might have

a major influence on player valuation, such as endorsements, off-field behavior, and injuries sustained by players. Neglecting these factors might result in imprecise insights and less precise prediction models.

2.2 Second Limitation

Limited samples & lack of validation: The study's sample size could be small, especially in light of how intricate the football player market is. The investigation only included a fraction of players from the top 5 leagues, which might have an impact on the models' performance and the results' generalizability. There is a chance of overfitting or bias in the results if the prediction models or the major elements determining player pay are not validated against independent datasets or real-world observations. The study's results would be more credible and reliable with external validation.

3. Synthesis

Although the study offers insightful information about player valuation, there are important obstacles to overcome, including the absence of external validation and feature scope limits. The study's breadth may be limited by ignoring important elements like player endorsements and injuries, and the validity of its conclusions may be called into question by the lack of outside confirmation. It is important to tackle these constraints in order to reinforce the study's contributions and guarantee its pertinence in providing insights for decision-making procedures in the football sector.