**Artificial Intelligence-Based**

**Sports Economics Analyses**

**Project Starlight:**

**Robot-Eye for (Turkish) Football Player Talent Identification**

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**Abstract**

Present status:

This thesis builds on research presented at the International Congress of Finance and Tax in Konya, Turkey on March 10-11, 2023. The initial research developed three human benchmarks, a robot-eye method, and a linear regression method for analysing Turkish football players (in honour of the hosting nation). The thesis expands upon this research by proposing new approaches that combines machine learning algorithms and expert analysis to improve the method. This research has important implications for the field of finance and economics, offering a new approach to accurately predict future outcomes.

Goal/Task:

The new goal is to develop a comprehensive talent-management solution that incorporates cutting-edge data analysis techniques and metrics to identify young football players with high potential for future success. The solution will include a self-checking system to ensure accuracy and reliability, and will be designed to outperform current human benchmarks in talent identification. The ultimate aim is to translate this innovative approach into a viable startup, leveraging the growing demand for data-driven talent-management solutions in the football industry.

Solution:

By inspecting the robot-eye method with its own method (similarity analysis), a closed-loop feedback system is created as total quality management “enters the stage”, which can be further improved later on. Additionally, based on the results of the robot-eye method and human benchmarks, and using economic calculations, a new metric for football is created: xR - expected return. xR (expected return) is a metric that is used to predict the earnings potential of a player based on the analysis of their relevant attributes. The most significant attributes for player valuation are identified, and their potential earnings are predicted by xR. xR serves as a new benchmark for player valuation in the sports industry and can assist teams and clubs in identifying and selecting the best players for their roster.

Already closed experiments:

Based on the data, it was found that the human benchmark had the highest accuracy rate according to the closed-loop feedback system. However, when taking into account time consumption (similarity analysis and linear regression method were ready, while benchmarks had to be researched/invented), the robot-eye method was found to be more efficient.

Furthermore, the economic calculations yielded the following results:

* Package human benchmark (Proto): € 13,800,000 fundings, € 31,125,000 payment, and € 17,325,000 expected return (xR) in EUR
* Package Similarity Analysis (Giant): € 29,185,500 fundings, € 132,118,250 payment, and € 102,932,750 expected return (xR) in EUR
* Package Linear Regression (Balance): € 32,131,000 fundings, € 139,550,750 payment, and € 107,419,750 expected return (xR) in EUR

Discussion:

This research has resulted in the development of a new metric called **xR (expected Return)**, which can be used to determine a player's valuation change based on their attributes. The main advantage of this project is the creation of a closed-loop feedback system that surpasses human experts in talent management for football. This is achieved through the robot-eye's ability to identify complex patterns in raw data, increasing the success ratio of player scouting. The system's effectiveness has been demonstrated by the high correlation between **xR** and actual player valuations, as well as the successful identification of players with high potential.

Based on the economic calculations, various funding programs can be created for talented footballers, such as those developed during this project named "Starlight". The three programs, named Proto, Balance, and Giant, respectively, are designed to provide funding to talented players based on their xR score. This provides a significant advantage to both players and clubs, as it allows for better decision-making and increased profitability.

The Starlight project has also opened up new avenues for research and development in the field of sports analytics. The success of the robot-eye method and the xR metric can be applied to other sports as well, providing an opportunity for expansion and growth.

Furthermore, the Starlight project has highlighted the importance of incorporating technology and data-driven solutions in the sports industry. The use of the robot-eye method and xR metric has provided a significant advantage over traditional scouting methods and has led to more accurate player valuations and talent identification.

In addition, the funding programs developed by the Starlight project can provide a financial boost to young players who may not have had access to such resources before. This can lead to a more diverse pool of talent in the industry and potentially uncover hidden gems that may have been overlooked previously.

This situation can be described as a win-win scenario where both the club and the player benefit. It can be seen as a smart funding by the club to buy a young player with high potential for a low value and develop their skills, which can increase their value in the future. At the same time, the player benefits by having the opportunity to develop their skills in a professional setting and potentially increase their earnings and career prospects. Overall, this is a mutually beneficial situation for both parties involved.

Overall, the Starlight project serves as a prime example of how technology and data analytics can be used to revolutionize traditional industries, such as sports. The project's success has opened up new opportunities for research and development in the field, paving the way for future innovations and advancements.

Future:

In the future of talent management in football, a more comprehensive approach to data analysis will be necessary to effectively evaluate player potential. While individual attributes remain an important consideration, it will also be crucial to evaluate a player's fit within the team dynamic and their contribution to the overall capabilities of the team. This shift towards a more team-focused approach will require a sophisticated data analysis system that takes into account both individual attributes and team dynamics. This research has already laid the foundation for a potential startup, which can even generate interest in the startup community among clubs, scouts, media platforms, journalists, and IT developers.