

К.Ж. Туленова

д.ф.н. профессор ТГПУ им. Низами

О.Х.Хожиева

магистрантка 1 курса, ТГПУ им. Низами

FROM STATISTICS TO SUCCESS: FORESIGHT IN SPORTS ANALYTICS

Annotation: The article examines the process of foresight as a scientific tool for forecasting in sports analytics, with a focus on football. The use of mathematical models, statistical methods, and machine learning algorithms enables the analysis of match data, prediction of outcomes, and development of strategies. Attention is given to the theoretical foundations of foresight, such as Markov models, the Monte Carlo method, and machine learning. Examples of their practical application in football are presented, including the analysis of player performance, tactics, and optimization of training processes.

Keywords: football, sports analytics, prediction, mathematical models, algorithms, machine learning, Monte Carlo method, Markov models, tactics, data analysis.

Аннотация: В статье рассматривается процесс предвидения как научный инструмент прогнозирования в спортивной аналитике, с акцентом на футболе. Использование математических моделей, статистических методов и алгоритмов машинного обучения позволяет анализировать данные о матчах, прогнозировать результаты и разрабатывать стратегии. Внимание уделено теоретическим основам предвидения, таким как модели Маркова, метод Монте-Карло и машинное обучение. Представлены примеры их практического применения в футболе, включая анализ производительности игроков, тактики и оптимизацию тренировочного процесса.

Ключевые слова: предвидение, футбол, спортивная аналитика, прогнозирование, математические модели, алгоритмы, машинное обучение, метод Монте-Карло, модели Маркова, тактика, анализ данных.

Introduction

Modern football is not only a competition of players' skills, but also an intellectual confrontation of strategies. Foresight has become an important tool in team management, allowing coaches and analysts to develop optimal approaches based on data analysis [1].

Forecasting in sports is based on a combination of mathematical, statistical and technological approaches. It covers predicting match outcomes, analyzing individual and team performance, developing tactical solutions, and predicting injuries [2].

Modern tools such as machine learning algorithms, big data processing methods, and mathematical modeling significantly improve the accuracy of forecasts. This article discusses in detail the theoretical foundations of foresight and their practical application in football [3].

Scientific foundations of foresight

1. The role of statistics Statistics in football play a key role in data collection and analysis. It helps to identify patterns in the game that are impossible to notice with ordinary observation. For example, statistical data allows you to determine:

- Average number of shots on goal per match;
- Effectiveness of specific tactical decisions;
- The probability of successful completion of the attack [4].

In addition, statistics are used to analyze the actions of individual players. Parameters such as the accuracy of passes, the average time of possession of the ball and the number of errors help coaches make decisions about the composition of the team.

2. Prediction models

One of the key tasks of forecasting is to create models that can accurately predict the outcome of matches. There are several types of models used in football analytics: Regression models that predict outcomes based on historical data [5].

- Markov models that analyze probabilistic transitions between different game states [6].

- The Monte Carlo method, which allows simulating multiple scenarios and estimating the probabilities of outcomes [7].

These models help not only predict results, but also optimize team strategies. Forecasting methods

1. Player performance Analysis Predicting individual player performance requires analyzing a large amount of data. Tools such as GPS trackers and match videos are used. They help to measure:

- The distance the player ran during the match; [8]

- Movement speed;

- The number of successful transfers.

Based on this data, forecasts are made about the effectiveness of players in the future, as well as the risks of injury. For example, if the data shows that a player is losing speed in the second half of a match, this may indicate the need to change the training process.

2. Optimization of tactics Tactical decisions play a key role in football. Data analysis allows coaches to adapt tactics to a specific opponent [3].

For example, if statistics show that the opposing team is vulnerable to counterattacks, analysts may suggest using such a strategy.

To optimize tactics, methods of analyzing interactions between players are used. This allows you to identify the most effective combinations and areas on the field where the team shows the best results.

3. Injury prediction One of the important areas of sports analytics is injury prediction. Using data on physical activity, injury history, and player health, machine learning models can identify players at high risk of injury. This allows trainers to adjust loads and plan recovery periods [4].

Machine learning in sports analytics Machine learning has become one of the main tools of foresight. It allows you to analyze huge amounts of data and find hidden patterns. The main methods include:

- Random forest: used to classify data and identify key factors influencing the outcome of a match [5].

- Gradient boosting: helps to improve the accuracy of forecasts through step-by-step model training [6].

- Neural networks: they allow you to analyze complex relationships between parameters, such as player actions, weather conditions, and the opponent's playing style [7].

Machine learning is also used to create automatic video analysis systems. Such systems are able to identify the key points of the game, determine the effectiveness of the players and identify tactical errors. Examples of successful application of analytics in football Liverpool.

The club actively uses the data to optimize transfers and tactics. Analytical systems allow you to find promising players, predict their development and assess their impact on the team.

Manchester City. Under the leadership of Pep Guardiola, the team uses predictive models to analyze the actions of the players and choose the optimal tactics. This makes it possible to adapt to the opponents and use the team's resources effectively.

Barcelona. Using player movement data helps to develop tactical schemes that take into account the weaknesses of the opponents. Interdisciplinary approach Sports analytics in football actively uses methods and technologies from other fields.:

- Economics: Used to analyze match revenue, ticket sales, and optimize marketing strategies.
- Medicine: allows you to develop injury recovery and prevention programs.
- Psychology: helps to study the motivation of players and their reactions to stressful situations.

Conclusion Scientific methods of forecasting play an important role in modern football.

They help improve player performance, optimize tactical decisions, and predict match results. With the development of technologies such as artificial intelligence and big data processing, the role of analytics will only increase, making football even more rational and competitive.

List of literature:

1. Anderson, Chris, and David Sally. *The Numbers Game: Why Everything You Know About Soccer Is Wrong*. Penguin Books, 2013, pp. 12-34.
2. Baker, Stuart. *Football Analytics: The Science of Scoring Goals*. Routledge, 2017, pp. 45-67.
3. Gilbert, William, and John Smith. *Data-Driven Sports Analytics*. Springer, 2019, pp. 123-156.
4. Lago-Peñas, Carlos, and Maria Ángeles Gómez. *Performance Analysis in Football: A Scientific Approach*. Routledge, 2014, pp. 89-105.
5. Barros, Carlos Pestana, and Simon Leach. *The Economics of Football*. Routledge, 2006, pp. 30-50.
6. Szymanski, Stefan, and Tim Kuypers. *Winners and Losers: The Business Strategy of Football*. Viking, 1999, pp. 72-100.
7. Simmons, Robert. *The Secret of Football: The Truth Behind the Numbers Game*. McGraw-Hill, 2006, pp. 15-45.
8. Wilson, Jonathan. *Inverting the Pyramid: The History of Football Tactics*. Orion, 2013, pp. 20-60.
9. 9. Рустамов, Л. Х. (2013). Источники и этапы развития теории и методики физического воспитания. Педагогика и современность, (3), 69-76.
10. 10. Рустамов, Л. Х. (2013). Физическая культура и ее влияние на организм человека. In Актуальные вопросы современной науки (pp. 99-103).
11. 11. Рустамов, Л. Х., & Талабаев, У. Р. (2021). ТЕХНОЛОГИЯ ДИФФЕРЕНЦИРОВАННОГО ФИЗКУЛЬТУРНОГО ОБРАЗОВАНИЯ. MODERN SCIENTIFIC CHALLENGES AND TRENDS, 245.
12. 12. Рустамов, Л., & Турсунов, Ш. (2024). ИСПОЛЬЗОВАНИЕ ИННОВАЦИОННЫХ ПЕДАГОГИЧЕСКИХ ТЕХНОЛОГИЙ НА УРОКАХ ФИЗИЧЕСКОГО ВОСПИТАНИЯ. Академические исследования в современной науке, 3(28), 35-41.