

chain industry by improving the transparency, security, and efficiency of supply chain processes. By providing a decentralized and secure platform for tracking and managing supply chain transactions, blockchain technology can address the challenges of information asymmetry, security breaches, and inefficiencies in the supply chain industry.

Overall, the adoption of blockchain technology in the supply chain industry is still in its early stages, but the potential benefits of blockchain-based solutions are significant. By addressing the challenges and limitations of using blockchain in supply chain management, stakeholders in the supply chain industry can leverage blockchain technology to achieve greater transparency, security, and efficiency in their supply chain processes, resulting in improved customer satisfaction, reduced costs, and enhanced competitiveness in the global marketplace.

PREDICTION OF THE RESULTS OF SPORTS EVENTS USING ARTIFICIAL NEURAL NETWORKS

Sergey Myroniuk, student

M. Suknov, PhD, Associate Professor

Kharkiv National University of Radioelectronics

The topic of forecasting the consequences of future events is relevant for everyday life, sports, economics, politics, etc. Every day, thousands of people place their bets on one or another event, using different methods of probability estimation. The use of various mathematical methods helps to obtain more accurate forecasts of results than the subjective forecasts of experts.

The future event is influenced by many factors in the system and external factors. Also, some parameters can affect not only the initial result, but also influence other parameters. An internal connection is established between them, which is difficult to predict.

The main problem of forecasting is the unpredictability and non-obviousness of connections in the system. Neural networks are able to take into account all these parameters and their impact on the result, which has increased the accuracy of

predicting the results of certain events. This is achieved by the ability to learn and generalize information, the ability to process data in parallel by many neurons simultaneously [1]. The undoubted advantage of artificial intelligence over human is the speed and ability to operate with significant amounts of information.

Therefore, this issue is relevant today and requires its solution.

The purpose of the study is to create a system to simplify the process of selecting events for betting, improve the balance statistics of bookmakers.

The object of research is the process of choosing sporting events. The subject of the research is forecasting the results of sports events. Based on the purpose of the study, the following tasks were set:

- review the known results of solving the problem;
- develop an event data collection process;
- perform integration with the service for calculating predictions for events;
- develop a backtesting algorithm;
- develop a software implementation of the backtesting algorithm;
- analyze the results.

To date, scientists have already worked on solving the problems of forecasting. Various studies have used all sorts of methods to predict outcomes. So far, most previous studies have applied statistical and probability methods, such as Poisson distribution [2], iterative Markov chain Monte Carlo modeling [3], discrete choice regression models for win-loss scenarios [4, 5, 6]. New research uses data sharing methods such as Naive Bayes [7, 8], Bayesian networks [9], machine support vector, neural and genetic optimization, or combinations of different machine learning algorithms [10]. In most works, attempts are made to provide the absolute values of the results of sports achievements by extrapolating the time series of sports achievements depending on the parameters of loads during training and competitions to some future point in time.

The study shows that these approaches are ineffective, since the accuracy of forecasting when they are used is 40-60%.

Among the possible solutions for obtaining the expected result, researchers use

artificial intelligence methods to create match predictions [11].

The possibility of using numerical forecasting was also considered, where it is possible to provide for a segment of the gain – a numerical value [12]. During the analysis of solutions to the problem of optimizing the prediction of the results of sports events, it was determined to follow the strategies that were previously tested in past studies.

Betting strategy is a structured approach to profit. To achieve the result, the system must turn the winnings to the bookmaker in its direction. This became possible with non-fixed coefficients. To test the strategy, it is proposed to conduct a “backtest” on it, that is, simulation of the strategy, starting from a certain point in time.

Each event has its own parameters: time and coefficients. In each period of time, the team has its own parameters, such as the number of won or lost matches. The user can simulate his "strategy". The strategy implies a set of factors by which events are filtered. The task is to check the created strategy, analyzing past sporting events. As a result, we must get the necessary minimum amount of investment, profit or loss. This is provided that we adhere to this strategy from some point in the past.

A significant factor is the addition of probability to the event that was generated by the Google AutoML service. This service creates classification models for all types of strategies and can, on request, give a forecast for any event.

Thus, as a result of the algorithm, we should get filtered past events, the percentage of return on investment. The number of events is important. The more their number, the more trust in this data. Such a result can be obtained when the factors are too narrowing the area of searching for events. If the backtesting has returned little events, then we cannot trust its results.

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