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Research Article

Intelligent Transmission Algorithm of College Physical Training Course Information Based on Big Data

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Physical education is an important part of higher education. Carrying out physical education teaching in accordance with national standards and carrying out physical fitness tests on a regular basis are the key tasks of physical education teaching. The existing problems are that the college sports curriculum is single, the evaluation standard of the sports curriculum is not unified, the timeliness and guiding significance of the physical education management system are low, and so on. The above problems make it difficult for students to correctly measure their physical health, and teachers have a heavy workload to guide students scientifically through complex data. This paper attempts to design and implement a more timely and readable college students' physical fitness analysis system. And through data mining technology, we can mine the relevant information hidden in the data to help teachers provide more scientific and effective guidance and suggestions for students. Based on the design of the intelligent control model of athlete training plan based on big data analysis, this paper conducts simulation experiments by using environmental simulation. A training plan to solve the problem of large data fluctuations in the data classification trend is presented.

1. Introduction

People's spiritual needs are also increasing, such as the increasingly strong demand for physical exercise, people's demand for venue equipment is constantly increasing, and the sports resources in the society have been far from meeting the needs of the masses. Social sports instructors in the lack of space and fewer and sports exercises in a mass ratio are not high, in this context, people look to the colleges and universities, colleges and universities sports resources are abundant, and largely mathematics schools have free space equipment and use the existing sports resources in colleges and universities to meet the needs of social mass sports, and on the one hand, can increase the income of colleges and universities.

And with the large numbers, according to the era of big data analysis software system based on advanced information resource collection, processing data highlights the unique advantages, which cover a vast number. According to the timeliness and high practical value, accuracy and timeliness are strong, the output diversification, so popular in the intelligent training schedule planning. Therefore, this article is based on large data analysis and design the sports athletes training schedule intelligent model; it can not only realize data analysis from the artificial changes to the computer, experience to the operation in real-time, and also can significantly improve data information processing the timeliness and reliability, to better planning and provide effective guidance for athletes training [1].

With the continuous development of Internet technology and computer technology, the concept of big data is more and more popular. With the rapid growth of the amount of information on the Internet, people are in the age of information explosion. It is the biggest challenge to the information retrieval system to retrieve the required resources from the huge amount of information. Improving the intelligence of the retrieval system is one of the problems that people need to solve urgently. The development of big data provides new ideas for the design of intelligent retrieval system, which is conducive to the development and progress of intelligent retrieval technology in China.

In the process of information resource utilization, information resources are too scattered. In order to search the information needed, Internet users often browse different websites, try different retrieval methods, and change various key words. Such retrieval is not systematic, which virtually reduces the retrieval efficiency. The use and development of big data have changed the traditional information storage habits. The existence of cloud retrieval enables network users to directly integrate the retrieval conditions with the help of the big data retrieval platform and improve the integrity of information retrieval. There are a variety of search tools at home and abroad, and each search engine is built on a different basis. However, each search engine can only cover about 30% of network resources, and reliable information only accounts for a small part, which has great limitations. Users need to try to use different retrieval tools in network retrieval to find their own satisfactory information resources.

Most of the existing search tools require users to provide enough accurate search terms and make use of keywords, rules, and classification for customers to make judgments. However, they lack sufficient interaction with customers and cannot intelligently inquire and guess customers' ideas. Most retrieval systems use different algorithms to match different retrieval words. This matching method leads to different systems and different matching results, which are closely related to user retrieval. The existing retrieval mode adopts centralized serial retrieval, which has low retrieval efficiency. If an error occurs at a node, the whole retrieval process will be seriously affected [2].

AI, for short is the forefront of science and technology, through the simulation, extends, and expands, and can make the retrieval system more intelligent, with knowledge related to social news, literature, and science disciplines of knowledge; the user with the aid of the information retrieval system to find information, if the system is intelligent enough, can lead to information that is not systematic and has no integrity [3].

Section 1 presents the introduction, Section 2 presents the related work, Section 3 presents the Okumura-Hata intelligent model, Section 4 presents experimental simulations, and Section 5 presents a summary of the full text.

The model framework is shown in Figure 1.

Through the research and analysis of Guangdong University's sports management system, aiming at the existing problems of sports management and new requirements, the university sports management cloud information system with distributed data processing is researched under Hadoop technology. Users can flexibly use Map and Reduce functions based on their requirements and programming rules. The MapReduce computing framework automatically divides tasks and completes each task execution.

At present, especially wearable devices, devices that collect various parameters in the process of movement have become a research hotspot at home and abroad. Physical training for students can be summarized as the following requirements: Training and physical fitness test position sensing student movement in the process of change, through the perception to realize the variation of the running process of the automatic meter circle, and can provide the run in the process of meter circle of auxiliary information and tips, and through combining with historical data statistics and difference analysis provide a more targeted physical stamina training plan.

2. Related Work

2.1. Big Data Collection. The big data mode is realized based on the collection and analysis of massive data. The big data acquisition process is shown in Figure 2.

The system is developed based on the Hadoop platform framework. The Web service software is developed and realized by Spring, Spring MVC, and Mybatis framework technology. Data acquisition layer provides external data source interface, solves the problem of multisystem data sharing, provides historical data interface, solves the problem of historical data guide, where external data sources and historical data can be cleaned, converted, batch, real-time collection, but also can do intelligent data format analysis and processing, and submit the processed data to the upper layer for storage and calculation. In parallel computing and distributed storage layer, according to the application scenarios of sports management attributes, and considering different application scenarios, the resource occupation and system response time are classified: batch computing, online computing, streaming computing, and AI learning. The application layer is mainly the man-machine interactive operation of each functional module of the system. It can be WebUI, Webservice, WebAPI, weighing APP, etc. to display, manage, and apply all kinds of PE teaching resources in the system to students, teachers, and university leaders through WebUI.

2.2. Big Data Processing. Data were extracted, processed, and output through the multidimensional correlation quantization attribute discretization algorithm [4]. The specific process is shown in Figure 3.

The traditional training schedule customization system has certain problems. The system terminal cannot process big data quickly, resulting in slow execution and seriously affecting the customization of the training schedule [5]. Aiming at the above problems, this paper designs an intelligent customization system for elite athletes' training schedules in the big data environment. In hardware design, the MAHSUH server [6] with top technology is adopted to collect and process big data, which is faster than traditional methods. The introduction of the advanced Okumura-Hata intelligent model [7] can effectively solve the data fluctuation in the trend division process of big data and realize intelligent operation at the same time, accelerate the intelligent process of sports training schedule, and help athletes to maximize their potential, to impact more excellent results. To verify the effectiveness of the design of the intelligent customization system for canoeing athletes' training progress in the big data environment, a simulation and comparison experiment was carried out in the simulation environment, and the proposed intelligent customization system was compared with the

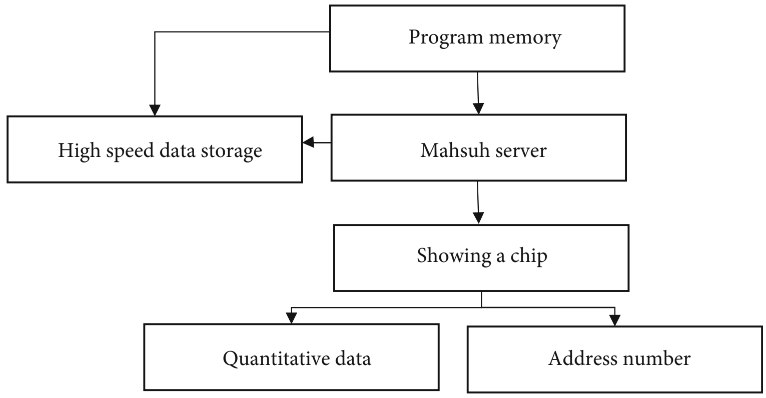

Figure 1: Intelligent model of sports athlete's training schedule.

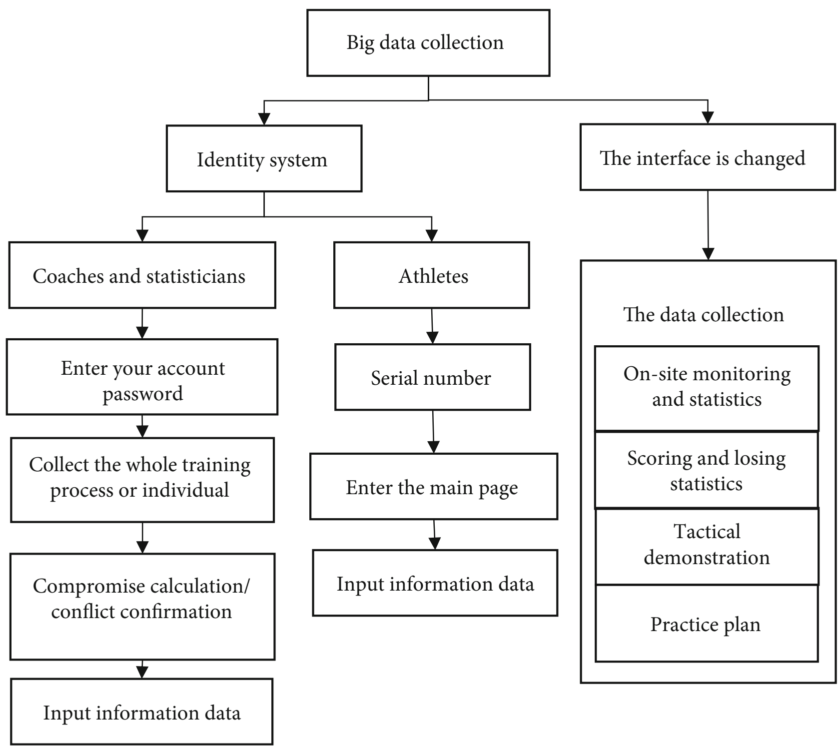

Figure 2: Big data acquisition process.

traditional training progress customization system. Through the effective proof of experimental data, it is verified that the proposed intelligent customization system can carry out rapid and accurate intelligent customization of schedule.

2.3. Research Status. In the past, data mining technology was mainly applied in the operation system of enterprises in China, but the awareness of data mining in universities was not strong. After the rise of big data, with the construction of the smart campus, attention was paid to the mining of student data, so the research level of student evaluation was not high. At present, scholars' research on a college student evaluation system mainly has the following characteristics: (a) value method is put forward, the implementation process of light and countermeasures [8]; Wu Zhentao in the evaluation on the students "as the center of the student work management system design and implementation of" one paper points out that the student evaluation is the important basis and part of the talent training and examining and will play a guiding role for personnel training; the author combines the actual conditions of their daily student management work, completes the design of system functions and data flow, and uses JSP programming framework to realize the student work management system with student assessment as the work center.

This system standardizes the business process of student assessment, improves work efficiency, and provides strong support for student management [9]. In his master's thesis,

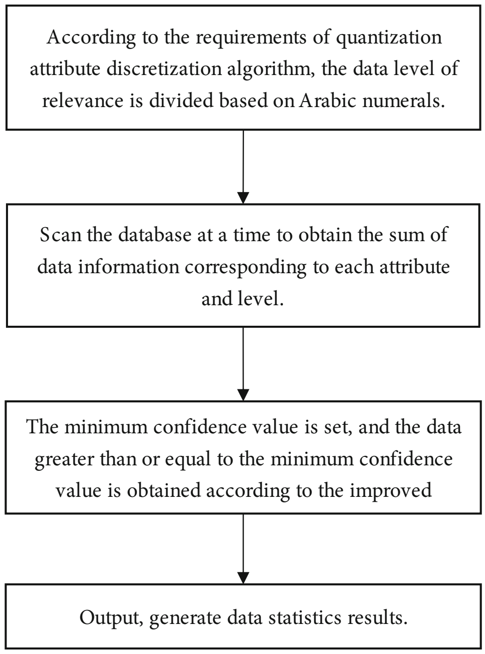

Figure 3: Big data processing process.

Table 1: Experimental data table.

The number of experimental	1	2	3	4	5	6
Model feedback rate (%)	32.4	46	57.8	64.7	77.9	90.4
The intensity of training	0.16	0.3	0.38	0.49	0.55	0.68

Li Shuang determined the student evaluation index system and weight settings. He used the method based on machine learning to model the student evaluation data of Liaoning Technical College, completed the system design, met the needs of school management, and better reflected the law of student growth. Ding Tie analyzed the necessity of introducing big data technology, main approaches of data collection, application strategies, and development suggestions in the paper.

In using big data to help in the innovation of ideological and political education in colleges and universities, first of all, we should establish data consciousness and be good at using data technology and thinking to serve students' overall development and personal growth. Secondly, we should integrate school resources and build a student management big data platform for the comprehensive sharing of school information resources. To sum up, the current domestic scholars' research results are mostly confined to the exploration of the theory and method of hypothesis, there are few scholars to realize the specific case, and verifying the big data technology is used to implement the effect of student evaluation; thus, it can be seen. In "+" Internet age using a new generation of information technology construction of wisdom campus, feasibility and urgency of the students' comprehensive evaluation system are established [10].

With the in-depth study of data mining technology, the application of data mining technology has gradually expanded to various different fields. Some scholars have applied data mining technology to the education industry and systematically discussed the importance of data mining technology applied to education and teaching. Using the rough sugar set theory, JansiRani et al. mined and analyzed the correlation between student achievement improvement and the dominant factors of active learning. In foreign countries, there are a lot of information data that can be mined in college education system, such as teaching evaluation, student performance, and student information. But at present, the research of data mining in university education is still based on theory, and there are not many products that are really applied to data mining technology. With the continuous expansion of domestic colleges and universities, the number of students and the data managed by colleges and universities increase year by year; in the processing of student information and student performance, the mode of manual processing has been unable to meet the current demand. Under such an environment, more and more scholars and researchers apply data mining technology to college education and physical analysis: seats by adopting the decision tree classification method, first apply data mining technology to student achievement information, build the professional ability of the decision tree model, and help teachers in teaching process through more accurate and efficient insight into the problems. The results can be used to optimize the teaching quality [11, 12].

Jiang Hongyan adopts decision tree ID3 algorithm and association rule apriori algorithm to conduct data mining analysis based on student performance data. Through ID3 algorithm analysis, students' excellent performance is obtained in which factors are related. Through the analysis of association rule Apriori algorithm, the influence of one course excellence on other courses is mined. Based on the physical health test data of 6 universities in Shaanxi, Chen Caihong used the FP-growth algorithm to study the physical health test data of students from a deeper level. The results showed that nearly half of the students in the six universities did not meet the weight standard, and it was observed through the results of the algorithm that students lacked the training of lower limb strength in the physical training, and their lung capacity and endurance levels were obviously weak, so it was suggested that students strengthen the training of aerobic exercise [13].

Based on the physical test data of northwest University for Nationalities, Zhao Changhong used the association rule apriori algorithm to screen five strong association rules for male and female students. The results showed that under the condition of "total score = pass," more girls failed in the standing long jump and more boys failed in the pull-up, so as to determine the sports that Northwest University for Nationalities needs to pay further attention to in the future and strengthen students' comprehensive physical quality [14].

3. Okumura-Hata Intelligent Model

The most generally used intelligent model in large data analysis is Okumura-Hata, whose major characteristic is efficient

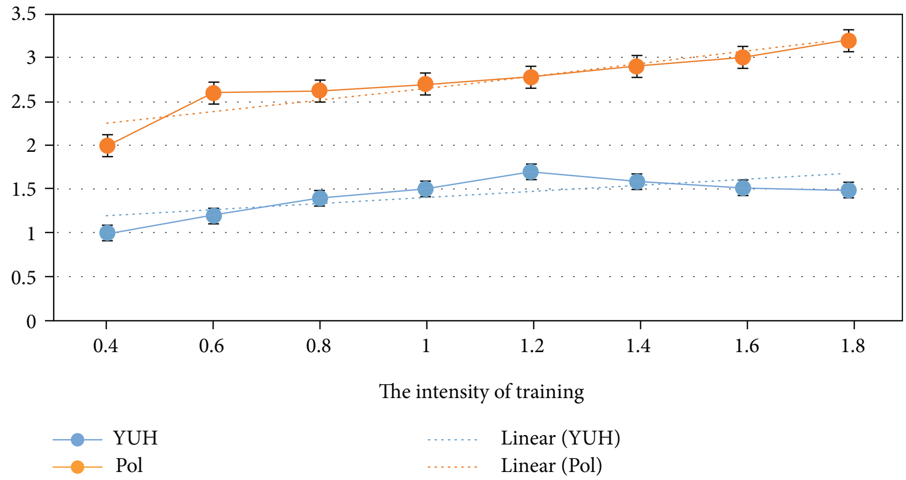

Figure 4: Experimental results of SO test.

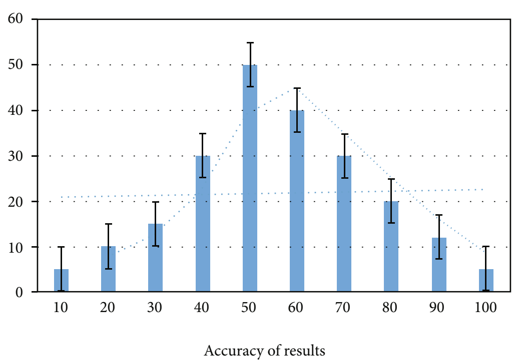

Figure 5: Data intensity.

anti-interference to assure model design accuracy and stability. The Okumura-Hata intelligent model can create models from obtained data and fully interpret and analyze data features. The Okumura-Hata intelligent model separates data using the Okumura coordinate system diagram and uses the normal distribution of curve functions to generate distinctive data relations. The Okumura-Hata intelligent model is created in order to accomplish the intelligent analysis of training progress data, and the intelligent extreme value specific analysis is first carried out for the data, namely,

$$\frac{Q(k)}{N(k)M(k)} = s_c\left[\frac{Q(k)}{N(k)M(k)}\right]^a\left[\frac{K(k)}{N(k)M(k)}\right]^{1-a-k} - \delta_h\left[\frac{G(E)}{N(T)} + \gamma\frac{Q(k)}{N(k)M(k)}\right]. \tag{1}$$

Specific feedback data of the Okumura-Hata intelligent model ($H(a)$), namely,

$$H(a) = \frac{\partial\Omega}{\partial v} = -\sum_{i=1}^{n} e_k w_i \xi_{ij} \partial l_i^{-1}, \tag{2}$$

where $V2$ is the time-delay parameter of an athlete's training motion characteristics, e_k is the annotation operator, and N is the number data's effective use value. The Okumura-Hata intelligent model's particular feedback data is a critical link in realizing intelligent athlete training schedule planning. Model construction can be accomplished in a preliminary manner using the methods described above [5].

Data transition is easy to occur in the data collection and intelligent feedback of athletes' training in the field of big data analysis based on the design of the Okumura-Hata intelligent model. The training progress algorithm procedure should be adjusted to successfully avoid it, namely,

$$\frac{\partial^2 N_2}{\partial i^2} = \frac{(k - k_m - N_2)W_0(i)}{w_0(i)} > 0, \tag{3}$$

$$\frac{\partial L_m}{\partial i} = \frac{(k - k_m - N_2)W_0(i)(k - N_i)}{A + w_0(i)\pi} > 0. \tag{4}$$

In the process of polar limit data formulation, N_2 is the mean coefficient of model weight, k_m is the simulation index of model data, I^2 is the ideal operation weight coefficient, W_0 is the attribute of big data expression, and A is the total amount displayed. When the algorithm is changed, the robustness between modules decreases over time, but the operation time increases. Automatic adjustment and optimization of the operation process should be made in this regard. The limit value is the entire quantity exhibited in the bipolar limit data drawing, and the maximum and lowest values of data can only be established after optimization and adjustment, namely,

$$G_f = \frac{R_f \cdot V_j}{[h_1, h_2, \cdots, h_p]} E_p \times \frac{X \times h \times v}{[X_1, X_2, \cdots, X_p]}, \tag{5}$$

where E_p is the proposed maximum critical value of total amount, $[h_1, h_2, \cdots, h_p]$ is the ordered collection of data values from maximum to minimum that can be utilized to

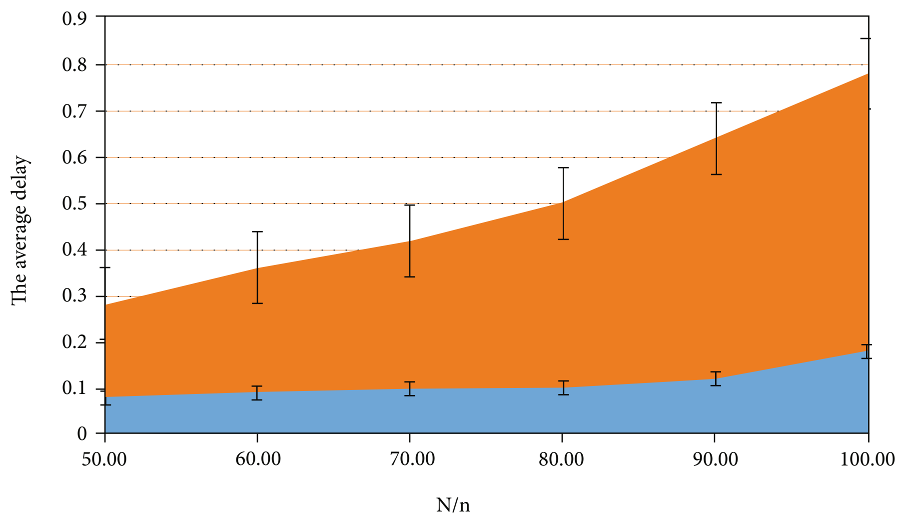

Figure 6: End-to-end average delay comparison.

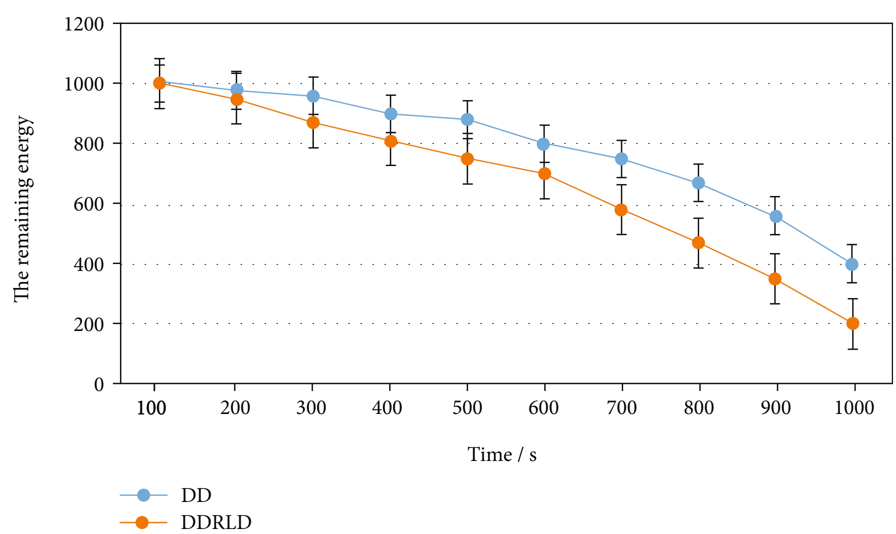

Figure 7: Comparison of the remaining energy of the entire network.

determine the ideal positive value of data, and $[X_1, X_2, \cdots, X_p]$ is the ordered collection of loss data. The intelligent model algorithm is adjusted and optimized using formulas (3) and (4) in order to ensure that the intelligent formulation of focused training schedule is applicable and reliable [6].

The degree of association between feature data (represented by P) and objects is called feature contribution and is represented. The characteristic data I and the contribution of the object are represented. The contribution of a feature describes the existence of feature data and indicates the probability of an object's existence.

If n features of the object are known and the probability of its existence is set as C_j, then

$$C_j = \sum_{i=1}^{n} \left(W_{ij} \times p_i \right). \tag{6}$$

In the set of objects, if $C_j = \max \{ C_i | i = 1, \cdots, k | \}$, the object is the most likely to exist.

The similarity of two objects I and J is equal to the ratio of the weighted sum of their same feature data, which is expressed by a ruler. In general, the more common the features, the closer the similarity is to 1. The similarity between objects is used to describe how many weighted features two objects have in common.

Set the same number of features as N, and the similarity of the object I and as scale rule:

$$R_{ij} = \frac{\sum_{k=0}^{N} W_{ki} \times p_k}{\sum_{k=0}^{N} W_{kj} \times p_k}, \tag{7}$$

When $i = j$, $R_{ij} = 1$, that is, the object is exactly like itself.

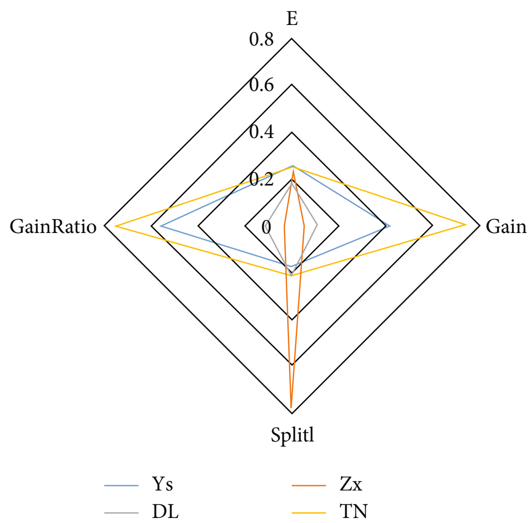

Figure 8: Calculation results of physical fitness data.

The comprehensive value A of the characteristic data I of the object k is equal to the product of the similarity between the object and KR_{ij} and the value V_{ij} of the characteristic data I of the object J, and the ratio of the diagnostic difficulty D of the object K, namely,

$$A_{ik} = \frac{\left(R_{kj} \times V_{ij}\right)}{d_k}. \tag{8}$$

For $k! = j$, that is, expand from the object to its similar object K. If $A_{ik} = \max \{A_{ij} | i = 1, \cdots, m \, ; j = 1, \cdots, n | \}$, the feature data I of object K is the supplementary feature data with priority.

The ratio of the weighted sum of known feature data to the weighted sum of all feature data of the object is called the reliability of the object decision, which is expressed by Q. For the object I to be judged, let the number of known feature numbers be n, and the total number of feature numbers be m. Obviously, $n \leq m$:

$$\theta_i = \sum_{j=1}^{n} \frac{W_{ij} \times p_j}{W_{ik} \times p_k}. \tag{9}$$

Generally, $Q! = 1$. When the value of credibility Q is 1, it is called completely trusted. After adding some characteristic data, if the Q value is large enough, the judgment of the object is considered correct. Otherwise, continue to complete feature data.

4. Results of Model Implementation

A more realistic node energy consumption model is adopted, and the sending interval of interest messages is set to 30 s. Other configurations of nodes are the same as those in reference [2]. The following is a statistical comparison of the two algorithms.

We ensure the effectiveness of the intelligent model experiment on the training progression of sports athletes, as shown in Table 1.

Loading SO, running software on the model, has no bearing on the model or the intelligence of big data analysis. The YUH index is used to assess the accuracy of data collection, and the POL parameter is used to assess model fit. Figure 4 depicts the exact experimental outcomes.

The POL parameter of the model for the intelligent formulation of the training progress of sports athletes is generally steady, always over 1.0, based on the data. The YUH index displays a moderate increasing trend, indicating that the model has a strong feedback ability. Figure 5 depicts the intelligent formulation model's specific data strength.

From the standpoint of big data analysis, the data intensity of the model for the intelligent formulation of basketball players' training progress is quite high, which can effectively reflect the base degree of data, as shown in Figure 5. The more data on which the model formulation is based, the more accurate the results are [7].

In the two algorithm modes, the influence of the change of node number N on the average delay of data transmission is shown in Figure 6. Each source node generates a data packet every time. With the increase of iv, the average delay of both algorithms increases. When iv is 50-100, the average delay of data transmission increases from 0.05 s to 0.2 s in DDRLD. In traditional DD, the average latency increased from 0.2 s to 0.65 s. The average delay in DD increases by a large amount because in traditional DD, more nodes are required to establish gradients to receive data, resulting in a large delay. In DDRLD, the network performance is stable and is not easily affected by the network scale. As the number of nodes increases, the performance of DDRLD becomes more obvious.

In the two algorithm modes, the variation of the remaining energy in the entire network over time is shown in Figure 6. Set the number N of nodes in the network to 100, and set the initial energy of each node to 10 J. As can be seen from Figure 7, in the same simulation scenario, the remaining energy of the entire network in DDRLD is higher than that in traditional DD. In DDRLD, the diffusion depth threshold of the gradient is added to reduce the diffusion range of interest packets during the query diffusion stage and update the query information stage, thus greatly reducing the amount of data transmitted in the network. By setting the threshold value of the remaining energy of nodes, the probability of each node being selected as a forwarding node is increased, the average working time of nodes is prolonged, the network load balance is improved, the network power consumption is reduced, and the survival time of the entire network is prolonged.

Based on the data obtained after data pretreatment, the "cardiopulmonary function" attribute in the physical fitness assessment table of college students has two different classification values: XF1 and XF2, respectively, representing qualified and unqualified. There were 1139 XF1 samples and 1862 XF2 samples in the dataset. The calculation results are shown in Figure 8.

From the calculation results of physical fitness data in Figure 8, it can be seen that the simulation results of various indicators are different. According to the information gain rate of each attribute calculated above, the attribute "exercise habit" has the largest GainRatio in the evaluation of students' physical health. Then, take the attribute DLXG as the root node, generate a branch according to the value of the attribute, and divide the two branches into new nodes. The above step J is executed recursively until it cannot be divided, and a decision tree about the "cardiopulmonary function" of college students' physical health is obtained.

5. Conclusion

Big data, cloud computing, and other technologies are widely used in information retrieval, bringing great opportunities for the development of the Internet and affecting people's production and life. In this case, intelligent information retrieval technology has changed the problems of scattered information resources and poor algorithm matching in the past, fully realized the interactivity and intelligence of the information retrieval process, and greatly reduced the time cost of the user retrieval process. We should improve the design of intelligent retrieval systems, encourage the advancement of information retrieval technology, and contribute to China's data development based on the concept of big data. Athletes' training schedules are traditionally planned in an artificial style, which takes too many human resources and complicates the procedure. In this regard, based on big data analysis, this work develops an intelligent control model for sports players' training schedules and conducts simulation experiments utilizing environment simulation.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares that he has no conflict of interest.

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