

## Application of BP neural network model in school physical education management

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**Keywords:** BP neural network; school physical management; fuzzy C means clustering; adaptive dynamic fusion

**Abstract:** In order to improve the management ability of school physical affairs, a school physical education management model is proposed based on BP neural network model, and the data distribution model of school physical information management is constructed. The method of large data mining is used to optimize the allocation of resources in school physical education management, and the information of school physical management resources is used in fuzzy C. The mean clustering method is used to classify the data of the school physical management data. The adaptive dynamic fusion method is used to deal with the information fusion of the school physical management data, and the distributed retrieval model of the school physical management data is constructed, and the characteristics of the association rules of the school physical management are BP. The neural network model is classified and identified to improve the fast fusion ability of the school physical management data. The simulation results show that the method is better for the data classification and recognition ability of the school physical management, and the ability to excavate the school physical management information is stronger, and the level of the intellectualization of the school physical management is improved.

### 1. Introduction

The routine management of school physical education is an important part of school management, which embodies the most basic requirements of school education and management, and has the characteristics of stability, adaptability, seriousness and administration. Any management has basic functions, such as planning, organizing, controlling, and leading, as well as coordinating, financial, and material resources in order to better achieve the stated goals. At present, as an important force to promote social development, management has been paid more and more attention and applied to practice. School teaching management is no exception. It is also an important means to carry out quality-oriented education and realize the goal of new curriculum reform<sup>[1]</sup>. The quality of school physical education management directly affects the quality of school teaching. If there are loopholes in the management of physical education, there will be problems in the implementation of physical education curriculum. Therefore, it is of positive significance to improve and strengthen the management of physical education teaching and training in schools. There are many management problems in physical education, the management consciousness of leaders is not strong, the subjective randomness is large, there is no reasonable arrangement of teaching and ensuring training, and the conditions of school restrict the development of physical training. Physical games are not held as scheduled for many reasons, physical fitness propaganda is not enough, physical academic exchanges and professional titles evaluation, compared with other disciplines, there is obvious discrimination; when organizing students to attend physical education classes, the participation rate of students is sometimes very low, the physical training time is often occupied by other courses, and some PE teachers have insufficient enthusiasm for work, lack of confidence, and so on. These phenomena obviously affect the development of

physical teaching and training management and the improvement of students' physical fitness. However, under the requirements of the new curriculum standard and quality education, it is necessary for schools to improve the management ability of physical education teaching and improve the quality of physical education teaching<sup>[2]</sup>. At the same time, speeding up the management of physical education teaching and training is a powerful guarantee for the cultivation of talents in the new era. In short, the management of physical education training is an important aspect and a complex project for the school teaching management, and it has great significance to take the management of physical education training as the key point that affects the school teaching management<sup>[3]</sup>.

## **2. Data distribution model and big data mining of School physical education information management**

The formation and development of cloud computing has become the main trend of the development of network services. Under this background, we must pay more attention to the huge data information related to the services. In modern society, the amount of information data that the system needs to deal with is increasing, which requires the configuration of corresponding hardware equipment in order to realize the unified processing, calculation and storage of massive data. At the same time, in order to achieve the security performance of the system, it is necessary to increase the user's hardware investment. For smaller companies, the increase of hardware cost will directly affect the economic benefits, in addition to the need for software configuration, update and maintenance of a series of management work, increasing the financial burden on users. Aiming at the above problems, a network service platform is developed under cloud computing, which includes many functions and functions to meet the business needs of small enterprises and to achieve orderly management of teaching information. The service platform based on cloud computing can ensure that users can extend the service function with the help of network program without installing software and purchasing hardware equipment, and can provide diversified services to meet the needs of different business. Realize the development goal of personalized customization service. Under the guidance of the theory and design principle, the university sports educational administration management system constructed by the research institute is realized.

## **3. Optimization of information processing model for school physical education management**

### **3.1. Fuzzy clustering processing**

On the basis of constructing the data distribution model of school physical information management and using big data mining method to optimize the allocation of resources in school physical management, the information processing model of school physical management is optimized. In this paper, a school physical education management model based on BP neural network model is proposed. The fuzzy C-means clustering method is used to classify and identify the information of school physical management resources.

### **3.2. BP neural network algorithm**

The distributed retrieval model of school physical education management data is constructed, and the BP neural network model is used to classify and identify the extracted association rules feature quantity of school physical management.

In the hidden layer of BP neural network in school physical education management, there are  $3n$  neurons, which are  $n$  proportional element,  $n$  integral element and  $n$  differential element, respectively. The distributed retrieval model of school physical education management data is constructed. BP neural network model is used to classify and recognize the managed association rule feature quantity. It is obtained that the calculation formula of the total input value of physical information feature extraction is the same as that of the BP neural network model:

The output weight of feature distribution layer of fuzzy neural network of school physical

management is  $w_{sij}$ . The adaptive dynamic fusion method is used to deal with the information fusion of school physical management data.

#### 4. Simulation experiment and result analysis

In order to test the application performance of this method in the realization of school physical education management and information processing, the simulation experiment is carried out. MATLAB simulation software is used for mathematical programming, and school physical information is set up. The management constraint parameters are set as  $G_{\max} = 30$ ,  $D = 12$ ,  $c = 3$ , and the school physical management information database is designed by distributed database, the period of data sampling  $T = 12$  s, and the clustering algorithm of school physical education information is run 100 times. In order to verify the effectiveness of SDLPP based cooperative collision avoidance method for mobile nodes in sensor networks, a simulation test is needed. Experimental mobile node collection: in LAN, Moore mobile node acquisition server is used to transmit the information of mobile nodes per second between various clients to simulate the transmission of mobile nodes on the sensor network group. At the same time, the packet grabbing software is used to collect the mobile node flow through the server, and the average mobile node traffic per 30min is 30 Mbps. The simulated hardware environment is a personal PC with a Windows operating system. It has 5.89GHz dual-core processor and 2GB of memory. By programming with C and MATLAB, the cooperative obstacle avoidance method of hidden structure of mobile nodes in sensor networks is designed. The experiment is carried out from two aspects: the filtering effect of sensor network group interference signal and the cooperative obstacle avoidance quality of hidden structure conflict of mobile nodes in the network. According to the above simulation environment and parameter setting, the method is carried out.

#### 5. Conclusions

In this paper, a school physical education management model is proposed based on BP neural network model, and the data distribution model of school physical information management is constructed. The method of large data mining is used to optimize the allocation of resources in school physical education management, and the information of school physical management resources is used in fuzzy C. The mean clustering method is used to classify the data of the school physical management data. The adaptive dynamic fusion method is used to deal with the information fusion of the school physical management data, and the distributed retrieval model of the school physical management data is constructed, and the characteristics of the association rules of the school physical management are BP. The neural network model is classified and identified to improve the fast fusion ability of the school physical management data. The simulation results show that the method is better for the data classification and recognition ability of the school physical management, and the ability to excavate the school physical management information is stronger, and the level of the intellectualization of the school physical management is improved. This method has good application value in the optimization management of school sports affairs.

#### 6. Prospects for Research

Under the pressure of employment, the study task of contemporary college students is extremely heavy. In order to improve their comprehensive quality, most of their spare time is occupied by various community activities. Although these activities enrich the students' extracurricular life, they consume their energy further, and it is difficult for them to relax and strengthen themselves. The formulation and implementation of a personalized exercise prescription will not only improve this situation but also promote a comprehensive improvement in the physical constitution of the students, laying the body foundation for their rapid adaptation to the onerous jobs.

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