

The Application of Multimedia Network Teaching Platform in College Dance Teaching

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Abstract: With the improvement of China's economy, the development of science and technology is increasing day by day. The use of computers is becoming increasingly widespread in various industries. Cloud platform is built on virtual technology, people can use the data stored in the computer without the constraint of space and time. The multimedia network teaching platform plays an important role in the teaching of colleges and universities. More and more attention has been paid to dance teaching platform based on multimedia network. This paper analyzes the application of cloud platform multimedia network teaching platform in university dance teaching, which is conducive to the development and promotion of scientific and technological achievements. The use of cloud platform can make resources fully Shared and teaching methods more vivid and rich. In addition, it helps to improve the teaching level.

1 Introduction

Computers have become very popular in our country. Colleges and universities have ushered in a new era of combination of science and technology and teaching. The multimedia network teaching can make the knowledge of physical education more obvious and vivid, and more intuitive to show students the study of sports (Zhou B et al 2016) [1]. The popularization of multi-media teaching in colleges and universities has broken the traditional teaching mode of physical education. Multimedia teaching can improve students' understanding of sports knowledge. The use of this model makes physical education more than 45 minutes of class time. Students can study at any time (Hu C et al 2016) [2]. However, the application of multimedia has not completely replaced the traditional PE teaching mode, but is complementary with the traditional teaching. These applications allow students to learn what they want without a teacher's timely guidance. In addition, it is very convenient for college students to obtain teaching resources. The popularization of multimedia technology also solves the shortage of teaching resources and the shortage of resources (Cai X et al 2017) [3]. In a word, the application of multimedia network platform in colleges and universities has brought great convenience to both students and teachers.

Based on cloud platform, the maximum sharing of these resources can be realized, and the benefit maximization can be realized in the limited funds. The data of these teaching resources can be focused on the cloud platform. The sharing of resources among universities can also be realized (Yin Y et al 2015) [4]. The cloud platform has considerable advantages. For example, the utilization of teaching resources is fully satisfied. The use of cloud platform can easily and easily search physical education courses (Chang D M et al 2015) [5]. This paper is an application of multimedia network teaching platform based on cloud platform in college physical education teaching, which can optimize China's physical education system and benefit education reform (Chen Y et al 2016) [6].

2 State of the Art

Genetic algorithm was first proposed in the United States in 1975. This algorithm is based on biological research and has evolutionary characteristics in biology. After being proposed, genetic algorithm is often used to solve the problem of intelligent technology. The genetic algorithm has many advantages, and it can search Global, it's an algorithm that has the uncertainty of simulating natural biology. It is highly adaptable. The steps to describe the problem are simplified. Therefore, it is widely recognized in the field of science (Zhao N et al 2015) [7]. Genetic algorithm brings great convenience to the users, and its ideas, running procedures and implementation steps are easy to learn. Its basic idea is to simulate the process of biological evolution, eliminate inferior results and get the best results. At the same time, it has good adaptability and can be applied to different types of functions. Currently, it is widely used in many fields such as automation, computer science and social management (Li X et al 2017) [8]. In China, the research on genetic algorithm starts late, and the understanding of genetic algorithm is not very mature, but the development level is not backward (Hu H et al 2016) [9]. Although it has become a hot spot in the field of intelligence, its research and development is still insufficient. It also has many undeveloped aspects. This paper is based on the application of multimedia network teaching platform in college physical education of the combination of genetic algorithm and cloud platform, and combine theory with research. The theory is connected with practice and put into practice. Additionally, it makes full use of the advantages of all parties, innovates teaching mode and improves the quality of physical education in China (Zeng L et al 2017) [10].

3. Methodology

3.1. The Calculation Procedure and Overall Planning Process of Genetic Algorithm

In the process of transmission, genetic algorithm was first developed by the United States. The model of genetic algorithm is put forward based on the convenience of practical operation, and the overall function of genetic algorithm is operated and improved on the basic control data of the model. Genetic algorithm can greatly improve the AI operation model. After analyzing all the computational results of the genetic algorithm, the best results and the most perfect data need to be selected. Considering the possible errors of each of our calculation results will be helpful for us to build a multimedia network teaching platform based on genetic algorithm. Under the help of this system model, the traditional biology genetic data type can be built up quickly. And then consider the actual test process according to the transformation and combination of biological genetic factor. After completing the model of the basic building system of genetic algorithm, the problem of how to use the genetic algorithm model need to be solved to perform the basic operation. In the process of building the system model, it is mainly to consider the different effects of different operations of the system model. In the operation of the data entry interface, the data transformation can be performed is stored as the overall data generated by the model. After storage is carried out, further calculation and simulation of genetic algorithm can be carried out. Using different data types in the light of different databases can reduce our computing gap. As soon as computing the storage space, the data build process that we need to do is to extract the information stored in the database. Once the extraction is completed, different information is processed separately according to the signal simulation method. Then the following overall operation process of the system is carried out according to the result of processing. After completing the data processing, the actual model operators will gradually optimize and process the calculation of the multimedia network teaching platform of genetic algorithm.

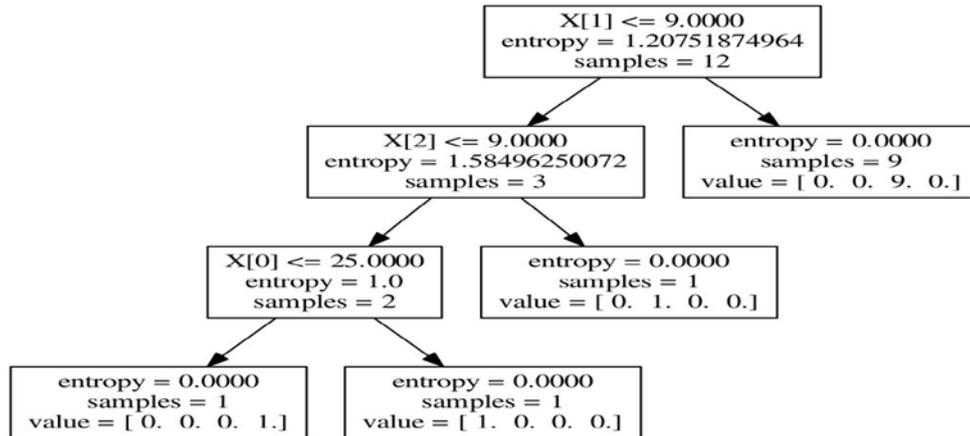


Fig.1 Architecture of the system

In building complete multimedia network teaching platform based on genetic algorithm, and the research of multimedia network teaching platform in the sports teaching practice, we need to use Internet technology to login and management interface settings. After the login and management interface is set up, all the information we have collected need to be processed and summarized. The collected and processed information is stored in database. In the process of building the system model based on genetic algorithm, we need the main login interface and information feedback processing skills, which is the problem we should pay attention to. In line with genetic algorithm, we can design multimedia physical education platform. Then, according to the teaching function of the physical education platform, the actual login interface selection should be made reasonably. The login interface is mainly the course selection system, the course classification, and the opinions and suggestions on sports teaching. All the information can be used to give us actual feedback through the system model. The moment the feedback is completed, we should plan and analyze the overall calculation data. As soon as the analysis is completed, we input the data of the system model we actually designed into the model library. The model is shown below.

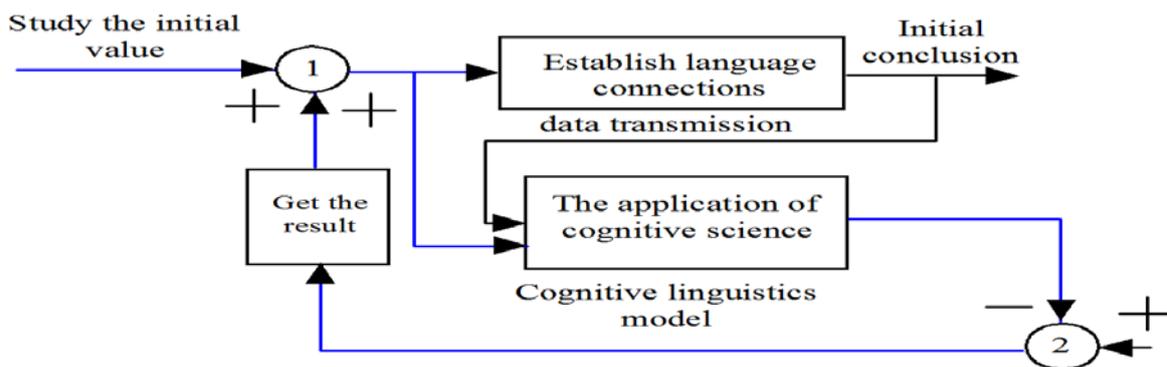


Fig.2 Function modules of the system

We should consider the influence of many factors in the construction of multimedia network teaching platform based on genetic algorithm in colleges and universities. In particular, we use genetic algorithm to build models, and we need to have a deeper understanding of genetic algorithm, so that we can ensure that our building process will not be wrong. After analyzing the results of the input, we find that students have their own opinions and opinions on the teaching methods in the course of physical education. In the process of making the questionnaire, according to the feedback information of students, we get the plan of course selection and course that most students like, which requires further optimization of the model to meet the students' requirements. We can further optimize the model system according to the feedback information of students. On the basis of the information in the database and the student information we obtained from the questionnaire, we can improve and optimize the login interface. In accordance with the above reference scheme, we have

a preliminary understanding of the construction of multimedia network teaching platform based on genetic algorithm. Secondly, what we need to do is to control the overall data impact of genetic factors, which is very important in the optimization and testing of genetic algorithm. According to the process of optimizing database information, the storage and processing of multimedia database are carried out. This is one of the main solutions to solve the problem of building Internet teaching platform based on genetic algorithm. In the system simulation test, we need to continuously integrate and filter the data as well as the control and selection of genetic factors suitable for genetic algorithm. All of these have helped us to build the Internet multimedia database.

3.2 A Preliminary study on Constructing Multimedia Network Teaching Platform based on Genetic Algorithm

In the foregoing we have a detailed understanding of the computational steps of genetic algorithms. Next, we will build the Internet multimedia network teaching platform on the basis of the genetic algorithm. And in the construction of the Internet multimedia network teaching platform, genetic algorithm is gradually optimized to make it more convenient to operate and complete the computing target. Then, the actual model will be constructed according to the selection of genetic factors in the genetic algorithm, and the actual model constructed is shown below.

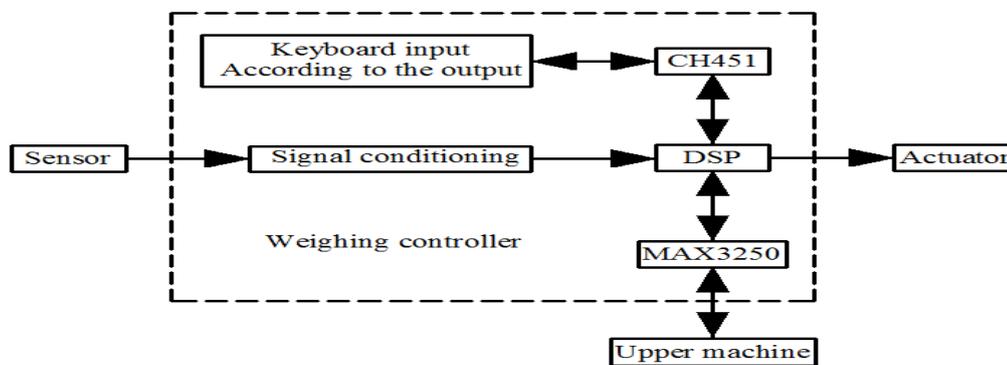


Fig.3 Structure diagram of neural network

After the construction of the operation model is completed, we can make a reasonable comparison and analysis of the overall computing performance of the operation model. Before the process of comparison and analysis begins, the narration of genetic algorithm calculation program will be carried out, so that we can have a general understanding of the computational process of genetic algorithm. Variations in nature can produce individuals with higher fitness. But there may also be individuals with lower fitness. In a word, variation is not necessarily beneficial, as is the variation in genetic algorithm. There are auxiliary steps in the algorithm, which are carried out on the premise of crossing. In order to maintain the consistency of nature, variation also is incorporated into the algorithm, although it is an auxiliary step. So we set up the calculation formula of variation as follows:

Set t represents the new value X_i^{t+1} of the individual $X_i^t = (x_1, x_2, \dots, x_n)$ variant of n dimension vector, and select a variable element x according to the characteristics of uniform distribution. It will mutate into a uniform random number r .

$$x_i = \begin{cases} r & \text{if } i = j \\ x & \text{if } i \neq j \end{cases}, j \in \{1, 2, \dots, n\} \text{ Evenly random selection} \quad (1)$$

To calculate the fitness, we refer to the fitness function as:

$$f_i = fitness(pop_i(t)) \quad (2)$$

In this paper, Monte Carlo method is used to select operator. This method is also called roulette wheel selection, and its formula of selection probability is as follows:

$$P_i = \frac{f_i}{\sum_{i=1}^N f_i} \quad (3)$$

Then use the approximate steepest descent method to update the offset value and weight:

$$W^m(k+1) = W^m(k) - as^m(a^{m-1})^T \quad (4)$$

$$b^m(k+1) = b^m(k) - as^m \quad (5)$$

After k times network training, the weight matrix of m layer is W and b is the offset value of the m-th layer. Besides, a^{m-1} is the output of the m-1-th layer, and s^m is the error index of MM layer output, also known as the sensitivity index. Using geometric nonlinearity principle and constitutive nonlinear principle, the stiffness matrix can be expressed as: K_e is the stiffness matrix, $[B]$ is the strain result, and $[D]$ represents the constitutive matrix.

$$K_e = \int [B]^T [D] [B] dv \quad (6)$$

4 Result Analysis and Discussion

After we have completed the construction of multimedia Internet operation platform based on genetic algorithm, we need to test the model of Internet operation platform built before. And according to the test results, the actual optimization measures are putted forward. In the case of data design, we need to improve them based on the overall data model. During the operation and testing process of the model, we need to gradually complete the optimization of the model. The convergence of the algorithm is tested which is very important for the data mining algorithm. In the practical use of the operating platform model of genetic algorithm, there will be many operational difficulties. All of these require us to find out these operational difficulties in the process of testing, and propose a reasonable solution to calculate the data model test. Once the calculation is completed, the final optimization measures of the model are obtained by comparing the results. After testing, we need to further process the data model. The steps are shown below.

Table.1 Automatic evaluation and manual correction of comparative data

Contrast data	accuracy rate	objectivity	Feedback ability	Promoting effect
Manual correction	0.92	0.82	0.91	0.82
Automatic correction	0.93	0.92	0.92	0.97
Semi manual and semi-automatic	0.95	0.97	0.98	0.96

This is considering the test evaluation of the three kinds of data model tests of Internet network teaching platform based on genetic algorithm design. By comparison, we can find that the Semi manual and semi-automatic data model we have designed is the most stable. The overall accuracy and operational level are over 95%, and there is a great deal of practical possibility. The data of this degree is completely satisfied with our actual needs, which can greatly save the time that we actually spend on the genetic algorithm for operation.

Table.2 Calculate the selection of some methods and parameters

Genetic process	Initialize the population		Genetic operation			End condition
	Initial population size	Feature selection initial probability	Encoding	Mutation probability	Crossover probability	
Parameter settings	100	0.33	Floating point code	0.35	0.95	200

After the process of the above comparison model is completed, the next question we need to face is whether the calculation can meet our actual needs in the process of genetic algorithm building model. This requires a lot of experiments. First, we set up a primary computing rate of 33%. Under the guidance of the initial calculation rate, we started the data operation 100 times. The results of the data show that the reliability of the system model of the network teaching platform in colleges based on genetic algorithm is 95%. The higher the reliability is in the system model design process, the better the whole system model is. The data obtained in our test 95% indicates that the model we developed is very complete and has practical operability.

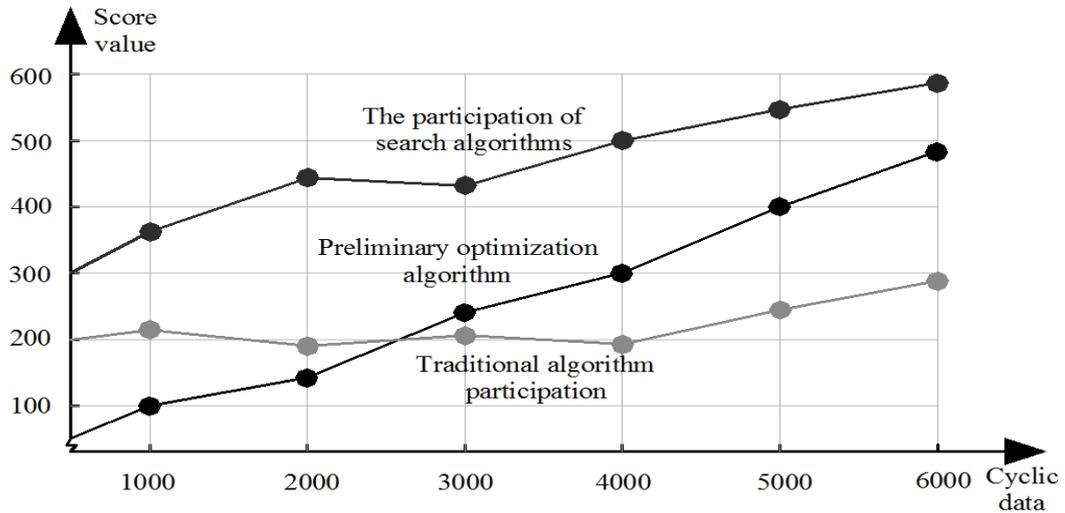


Figure.4 The design of the integrated algorithm calculation model diagram

The individual with the highest fitness will be calculated, but will be affected by the number of individuals in the population. The larger the population density is, the longer the calculation is. The smaller the number of population is; the shorter the calculation times are. In addition, it can be seen that the magnitude of the probability density also affects the computation time. However, no matter how it changes, the optimal genetic algorithm used in this paper will accurately calculate the optimal individual, which indicates that the algorithm used in this paper is feasible. This paper can do a population calculation of 30 individuals, and iterate 100 times can also maintain good results, which shows that the algorithm can calculate the mass of the data. This is very important for the calculation of this paper, which can not only calculate the individual with 100% fitness, but also carry out large-scale calculation and analysis.

Table.3 Comparison of three algorithm test results table

function	Traditional genetic algorithm		Others improved genetic algorithm		This paper improves the genetic algorithm	
	The final solution of the average	Optimal solution	The final solution of the average	Optimal solution	The final solution of the average	Optimal solution
Carrel	3	5	4	1	3	3

Due to the computational steps of the genetic algorithm, the computation time must be changed with the number of iterations and the population size, which cannot be changed. But this article did it in the shortest amount of iterations to calculate the fitness for 100% of the individual, the corresponding also reduced the calculation time of genetic algorithm, which saves a large amount of computing time for us. In addition, a series of comparative experiments is conducted to prove that our algorithm is better. Through the above test results, we can draw a conclusion that the optimized algorithm is far superior to the traditional algorithm in both calculation accuracy and computation time. The maximum difference is 5 points, which is a great affirmation to the optimized genetic algorithm.

5 Conclusion

With the emphasis on the national health status of our country, the state has issued some documents concerning sports. This has aroused the attention of the society to the physical health as well as the importance of the physical education in colleges and universities. The teaching of physical education in colleges and universities in our country has been carrying out with innovative teaching. Using cloud platform technology, education people can improve their education level in each other's learning. It also allows students to be more active and easier to study sports, and to be more convenient and intuitive to master their physical skills. The combination of network technology and traditional teaching technology can make full use of the advantages of both, and can effectively improve teaching quality and teaching effect. The application of network technology in sports is still in the primary stage. There are not many universities that link physical education with cloud platform technology and multimedia technology. In particular, the poor areas also need the help of the state and society. However, the application of cloud technology can effectively solve the problem of the shortage of teachers in China, so that the teaching resources are more open and shared, which can promote the development of education. This paper is an application of genetic algorithm in the multimedia network teaching platform in the college physical education based on cloud platform technology. It uses large-scale data analysis to optimize the education enterprise in our country, so that promotes the development of physical education in China.

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