WILEY | Hindawi

Research Article

Teaching Practice of Dragon and Lion Dance in Colleges and Universities with the Support of Big Data Technology

Liangjun Chen,[1] Yuhang Liu,[2] Tao Zuo,[1] Tongyu Meng,[1] Yang Xu,[1] Pei Luo,[2] and Mingyuan Huang [1]

[1]*Course Department, Hunan College of Information, Changsha, 410000 Hunan, China*
[2]*College of Physical Education, Hunan Normal University, Changsha, 410012 Hunan, China*

Correspondence should be addressed to Mingyuan Huang; huangmy@csnu.edu.cn

Colleges and universities are an important part of China's higher education. They undertake the important task of cultivating talents and are an important part of the construction of a harmonious society. Building a harmonious campus is not only the cornerstone of building a harmonious society but also the internal need to promote the comprehensive, coordinated, and sustainable development of various undertakings in colleges and universities, but also an important goal of the construction, reform, and development of colleges and universities. Therefore, building a harmonious campus has become a new task for colleges and universities, and the construction of harmonious campus culture is the core content of building a harmonious campus. Dragon and lion dance, which originated in China, is a nationally unique art form and deeply contains broad Chinese traditional culture. Studying the role of dragon and lion dance in promoting the construction of harmonious campus culture in colleges and universities will help to strengthen the school's sports work and enhance national unity, so as to promote the construction of a harmonious campus. Firstly, combined with the characteristics of dragon and lion dance practice, this paper expounds on the development value and strategy of dragon and lion dance in colleges and universities. Then, with the support of big data, the teaching of dragon and lion dance in colleges and universities was studied. An improved depth neural network is used to analyze the data using deep neural mapping support vector machine (DNMSVM) and cross-connected convolutional network. Simulation experiments verify the effectiveness of the model and promote the promotion and popularization of the dragon and lion dance in colleges and universities.

1. Introduction

Dragon and lion dance is a traditional national sport in China. It not only has distinct national characteristics but also has a profound cultural heritage. It is a treasure in the field of national traditional sports in China. In recent years, the dragon and lion dance movement began to gradually enter the university campus, quietly rose in some colleges and universities, and attracted more and more attention [1]. As an excellent folk art, the dragon and lion dance has a profound cultural heritage. Carrying out dragon and lion dance in colleges and universities will enable students to have a deeper understanding of national culture and national spirit and effectively promote the promotion of national culture among college students [2].

Dragon and lion dance integrates fitness and entertainment, has good fitness value and heart value, and plays a positive role in promoting the improvement of college students' physical and mental quality. Dragon and lion dance usually requires two or more people to complete a series of somersaults or swims with the rhythm of the music. A large number of activities, strong duration, and strong skills can effectively consolidate the foundation of students' physical quality [3]. It can promote the development of students' endurance quality, strength quality, and sensitivity quality and has a remarkable fitness effect. In addition to fitness, the dragon and lion dance is magnificent or ups and downs, which is highly ornamental and entertaining. Whether participating in it or watching it, it plays a role in entertaining the body and mind and is of great help to the improvement of students' mental health
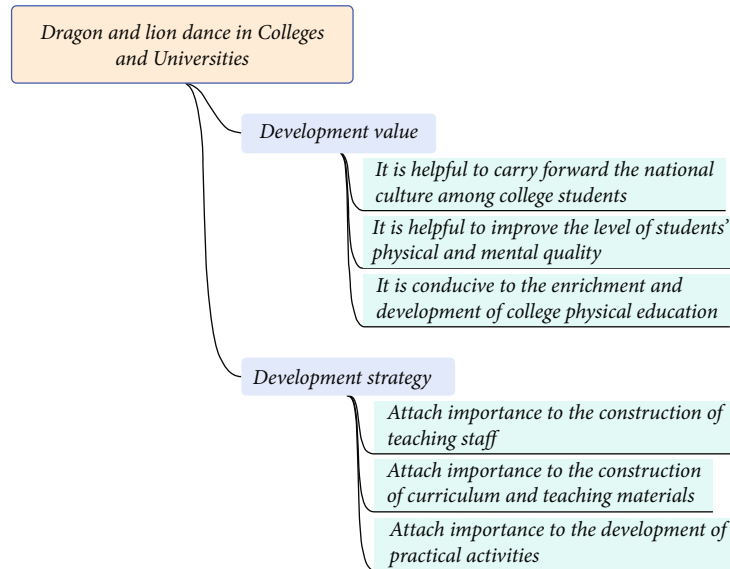
FIGURE 1: The concept of dragon and lion dance in colleges and universities.

[4]. For a long time, the content of physical education in colleges and universities in China is mainly traditional competitive sports, such as track and field sports and ball games. The content is old and the form is single, which is difficult to fully meet the needs of students' physical education learning and physical participation [5]. Under such circumstances, dragon and lion dance, as a flexible, interesting, cooperative, and tacit national sports project, has greatly enriched the content of college sports and played a positive role in stimulating students' interest in sports and promoting innovation and development of college sports. The concept of dragon and lion dance in colleges and universities is shown in Figure 1.

According to the above analysis, the development of dragon and lion dance in colleges and universities has important value in many aspects. Therefore, combined with the reality of colleges and universities, the following put forward some specific strategies for the development of dragon and lion dance in colleges and universities. Due to the late start of dragon and lion dance in colleges and universities, there is an obvious shortage of professional teachers [6]. The teachers and coaches of dragon and lion dance in many schools are not from professional backgrounds. For example, the teachers and coaches of dragon and lion dance in some schools are transferred from countless teachers from professional backgrounds. Although these teachers are competent for the basic teaching and training of dragon and lion dance, in the long run, the lack of professional teachers will inevitably affect the effectiveness of dragon and lion dance teaching and training in colleges and universities and the healthy and benign development of dragon and lion dance in colleges and universities [7]. Therefore, when carrying out dragon and lion dances in colleges and universities, we must pay attention to strengthening the construction of teachers. Try to select teachers and coaches with a professional background to be responsible for the teaching and training of dragon and lion dance [8]. On the other hand, in order to improve the professional level of the existing dragon and lion dance teachers and coaches in the school, we should not only encourage them to study by themselves but also provide them with opportunities for further study and training as far as possible when conditions permit. Multipronged approach, and constantly optimize the school dragon and lion dance teachers.

At present, when colleges and universities carry out dragon and lion dance, they mainly adopt several forms such as elective courses, specialized courses, and representative teams. No matter what kind of teaching form is adopted, there must be corresponding and scientific teaching materials [9]. However, the time for colleges and universities to carry out dragon and lion dances is limited. At present, it is still in the primary stage of exploration, so there is a lack of unified and systematic curriculum materials. In this way, when teachers and coaches carry out the teaching and training of dragon and lion dance in colleges and universities, there will be great blindness and randomness in the selection and application of teaching materials [10]. Once there are problems in the selection of teaching materials, it will inevitably affect the development effect of dragon and lion dance in colleges and universities. Therefore, when carrying out dragon and lion dance, colleges and universities must also pay attention to the construction of curricula and teaching materials.

The unique contribution of the paper includes the following:

(i) Performing exhaustive review of the present development status of dragon and lion dance in colleges and universities in China

(ii) Analysis of the factors affecting dragon and lion dance was performed using DNMSVM and cross-connected convolutional neural network

The organization of the paper is as follows: Section 2 discusses the related study, Section 3 presents the design of the

application model followed by the experimentation and results in Section 4, and finally, the conclusion is presented in Section 5.

2. Related Work

2.1. Development Status of Dragon and Lion Dance in Colleges and Universities. There are thousands of colleges and universities in China, with tens of millions of college students. At present, many sports colleges and universities in China have opened professional courses in dragon and lion dance, trained a group of reserve talents in dragon and lion dance, and provided technical and talent support for the development of this traditional sports project [11]. More and more colleges and universities have also set up optional courses or elective courses in dragon and lion dance, and some colleges and universities have also established dragon and lion sports teams. With high comprehensive quality and advanced thought, the team of colleges and universities plays a very important role in promoting the dragon and lion movement from folk to formal. Therefore, although the rise of the dragon and lion movement in colleges and universities has only been more than ten years, it has developed rapidly and has started a prairie fire [12]. In addition to actively participating in various performances inside and outside the school, they are also active in various venues organized by the China Dragon and Lion Sports Association. Their sports level is improving day by day, and the gap between them and the original strong teams in China is gradually narrowing. Dragon and lion culture is a treasure in the excellent cultural treasure house of the Chinese nation. It has survived for thousands of years. It has extremely vigorous vitality and irreplaceable contemporary cultural inheritance value. The dragon and lion dance is lively and generous and can be changed freely according to different occasions, which is full of meaning [13]. The development status of dragon and lion dance in colleges and universities is shown in Figure 2.

If the school holds a dragon and lion dance performance at the opening ceremony of the track and field games, it can add festive color to the games. For a long time, the content of school physical education in China is mostly western physical education. Colleges and universities have good comprehensive resource advantages and can conduct in-depth research on national traditional sports. Therefore, as a popular sport, dragon and lion dance is set up as a college physical education and health course. Its benefits are obvious [14]. It cannot only supplement and improve modern competitive sports and enrich teaching content and fully mobilize students' enthusiasm to participate in physical education but also let students understand and recognize national traditional sports, carry forward the national spirit, and promote the inheritance and development of campus national traditional culture.

In order to improve the teaching quality of physical education, it is conducive to the personality development of college students and brings vitality to college physical education. In the big family of colleges and universities, there are teachers and students from different nationalities all over the country. To build a harmonious campus, national unity is particularly important [15]. If we want to closely contact the majority of teachers and students and enhance the common group consciousness, we need a good means and link. The dragon and lion dance, which combines teaching with fun and is healthy and upward, has greatly enriched the campus cultural life of the majority of students and guided the majority of teachers, students, and employees to actively participate in sports [16]. At the same time, it can mobilize a large number of audiences to watch and appreciate, which is conducive to the formation of a healthy, positive, and upward sports cultural atmosphere on the campus. It is also inspired by the strong sports cultural atmosphere [17]. Attract some teachers and students who are unwilling to engage in or rarely engage in physical exercise to the team of physical exercise, so as to activate the campus atmosphere, enhance college students' love for the traditional sports culture of the motherland, and enhance their patriotic enthusiasm for loving the school, which is conducive to the construction of harmonious campus culture.

2.2. Disadvantages of Dragon and Lion Sports Development. The scientific research on dragon and lion theory lags behind. The theories related to the dragon and lion movement, in the final analysis, are the dragon and lion culture theory. We should realize that the research on this theory is still not enough. Although the dragon and lion movement has been carried out for nearly 20 years, our relevant theoretical research is relatively lagging behind and is still at a preliminary level. In the research field of dragon and lion theory, there are still a large number of space zones, which need us to study carefully [18]. The improvement of the theoretical research system is conducive to the development and promotion of dragon and lion dance. Therefore, we should adjust our ideas and layout and jointly study how to speed up the process of theoretical research on the dragon and lion dance through our joint efforts. The unbalanced development of dragon and lion sports in China is mainly reflected in the imbalance of project participants and regional development. As far as the participants of traditional dragon and lion sports are concerned, the main inheritance groups are rural residents, while the main participants of competitive dragon and lion sports now show a diversified trend [19]. From the development form of competitive dragon and lion sports in recent years, we can clearly understand that colleges and universities are the crowds to promote and popularize the development of dragon and lion sports. The development disadvantages of dragon and lion sports are shown in Figure 3.

Dragon and lion sports mainly include dragon dance, north lion, and south lion. Since it was officially listed as a sports competition in 1995, due to the different essential characteristics of folk sports of different nationalities, it shows the imbalance of regional development [20]. Due to the regional development, the unbalanced development of dragon and lion dance projects will have a certain inhibitory effect on the overall development of dragon and lion sports. The technical system of dragon and lion dance is the core
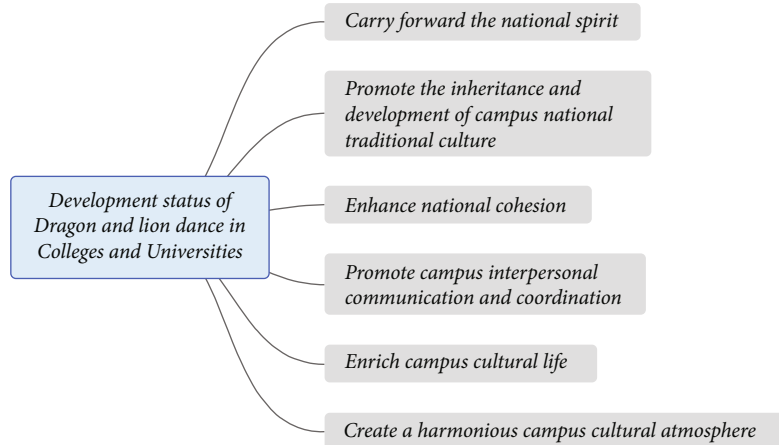
Figure 2: The development status of dragon and lion dance in colleges and universities.
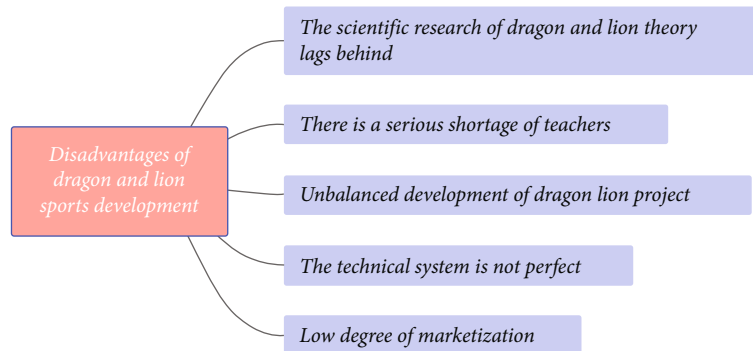

Figure 3: The development disadvantages of dragon and lion sports.

and key of the discipline system of dragon and lion dance. It is the bridge and link between the theory and practice of dragon and lion dance [21]. Only by transforming the basic theoretical basis of dragon and lion dance and its related theories and motion principles into dragon and lion dance technology can it have practical operability and really promote the transformation from theory to practice. The technical system of dragon and lion dance is the central link of the discipline system of dragon and lion dance [22]. It is not only an important direction to lead the development of dragon and lion dance technology but also a place where the current research does not pay enough attention, but also a difficulty in the construction of the discipline system of dragon and lion dance [23]. On the contrary, we should boldly break through and innovate and really build a perfect technical system of dragon and lion dance from a hierarchical perspective, so as to ensure the stable and sustainable development of dragon and lion dance [24]. However, in general, the market of national and international dragon and lion events is basically a combination of China Dragon and Lion Sports Association and social cooperation. A relatively perfect competition system has been basically formed, but the degree of marketization is still very low.

2.3. Research Status of Big Data Technology. The era of big data has changed traditional data science based on mathe-

matical statistics and promoted the innovation of data analysis methods. Deep learning evolved from machine learning and multilayer neural network is the research frontier of big data processing and analysis [25]. From machine learning to deep learning, it has experienced decades of research and practice in early symbolic induction machine learning, statistical machine learning, neural network, and data mining since the end of the 20th century. It is found that deep learning can tap the potential value of big data. This paper gives an overview of big data and deep learning [26]. In particular, it gives the atlas of the relationship between various deep structures and their learning algorithms and gives well-known cases of the application of deep learning in several fields [27]. Finally, it looks forward to the development and challenges of deep learning on big data.

Since the beginning of the 21st century, the industry has begun to realize that the scale and speed of data generation may put pressure on infrastructure, especially storage devices. As early as 2000, the Sloan Digital Sky Survey project was launched. Its telescope in New Mexico collected more data in just a few weeks than in the history of astronomy [28]. This shows that in addition to the Internet, the Internet of things, mobile terminals, and even traditional industries are rapidly generating a large amount of data. Big data is produced so fast that higher requirements are put forward for storage. The industry has invested in the

construction of large-scale data storage infrastructure. Big data needs not only proper storage and supervision but also timely and effective analysis and processing, so as to tap its value. When using big data for analysis, the differences are as follows [29, 30]: (1) use full life cycle data, that is, not samples but all; (2) compared with accurate data analysis, it pays more attention to the analysis of the full amount of complex and diverse data; (3) compared with the traditional causality analysis, it pays more attention to the correlation between things; and (4) the big data analysis results based on machine learning will reduce the subjective factors in traditional decision-making. Data analysis is the core of the whole big data processing process. What is processed in this layer is the data extracted and integrated from heterogeneous data sources, also known as the original data of analysis. In order to support the real-time data processing of the whole amount of data, it is impossible to grasp the characteristics of the whole life cycle of data because it is sometimes impossible to store permanently and the data use environment continues to change [31, 32]. How to build unbiased training integration based on historical data through traditional batch algorithms is a new challenge. In the big data environment, the ability of data production and collection is increasing, which leads to the increase in data scale and presents new characteristics: large and sparse attributes, large and noisy data volume, and high-dimensional and complex data. The study in [33] implemented DNMSVM using the general linear kernel NEUROSVM. The study in [34, 35] used DNMSVM technique for the neuroimaging based diagnosis of Parkinson's disease. Deep neural mapping large margin distribution machine (LDM) was used to perform kernel mapping instead of implementing implicit kernel function in LDM.

3. Design of Application Model

3.1. Deep Neural Mapping Support Vector Machine. Kernel learning improves the performance of support vector machines to a certain extent. Multicore learning is still a shallow structure in essence, which is not enough to express the relatively complex structure, and the deep structure may be better than the shallow structure. Therefore, for the problem of kernel learning, this chapter proposes an optional method and explores the depth structure with strong representation ability. Its main idea is to use the depth neural network to express the kernel mapping, and the output of the depth network is the input of the support vector machine. This model is called a deep neural mapping support vector machine.

In theory, DNMSVM will produce any kernel mapping approximate support vector machine, so it can be regarded as a general support vector machine model. In this model, kernel mapping explicitly transforms the original input space into feature space in the form of a neural network rather than using the implicit form induced by the kernel function. The choice of kernel has a significant effect on the performance of the SVM classifier model. In case of DNMSVM, the subnetwork is considered as the kernel mapping from the original input space to a feature space. This model acts as a general kernel learning technique where the kernel mapping is presented as an explicit function expressed as a subnetwork which is different from an implicit function being traditionally induced by the kernel function [33]. The study in [33] implemented DNMSVM using the general linear kernel NEUROSVM. The study in [34, 36] used DNMSVM technique for the neuroimaging based diagnosis of Parkinson's disease. Deep neural mapping large margin distribution machine (LDM) was used to perform kernel mapping instead of implementing implicit kernel function in LDM. DNMSVM can combine the advantages of deep network and support vector machine in joint optimization. Generally, DNMSVM includes an input layer, multiple hidden layers, and a support vector machine output layer. The overall structure is shown in Figure 4.

In DNMSVM, FM defines a kernel mapping from input x to the r-th implicit vector, and its mathematical expression is as follows.

$$\Phi(\mathbf{x}|\boldsymbol{\theta}) = \mathbf{h}_r. \tag{1}$$

The calculation process of DNMSVM is as follows:

$$\begin{cases} \mathbf{h}_0^l = \mathbf{x}^l, \\ \mathbf{h}_j^l = \sigma\left(\mathbf{W}^j \mathbf{h}_{j-1}^l + \mathbf{b}^j\right), 1 \leq j \leq r, \\ o^l = \mathbf{W}^{r+1} \Phi\left(\mathbf{x}^l\right) + b^{r+1}, \text{with } \Phi\left(\mathbf{x}^l\right) = \mathbf{h}_r^l. \end{cases} \tag{2}$$

The principle of DNMSVM is to map the original input to the appropriate dimensional space through the kernel mapping expressed by a multilayer perceptron and then use a soft interval support vector machine for classification in this space. Its essence is a support vector machine with a kernel function. However, unlike the support vector machine with kernel function, which uses kernel techniques to transform the original data, DNMSVM uses the kernel mapping function represented by a multilayer perceptron to transform the original data without using kernel techniques. In training, firstly, the restricted Boltzmann machine is used to pretrain the feature extraction module subnetwork layer by layer, and then, the backpropagation is used to jointly train the feature extraction module and classification module. The whole training process does not require the use of nuclear skills. In other words, the subnetwork of the feature extraction module first uses backpropagation to train with an ordinary output layer and then takes the output of the last hidden layer as the input of the support vector machine classifier for further training. At this time, the parameters of the subnetwork remain unchanged. On the surface, DNMSVM is almost like using a multilayer perceptron for creating a subnetwork of feature modules of NEUROSVM. In fact, they fundamentally differ in the objective function. The expression of the objective function of the multilayer perceptron is as follows.
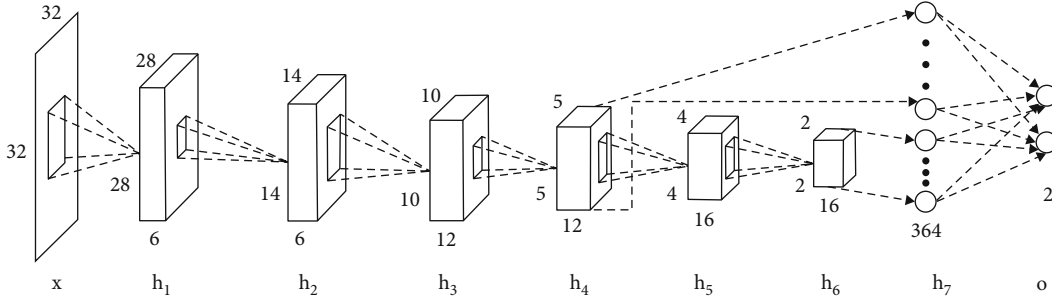
$$L_M = \frac{1}{2} o^l - y^{l^2}. \tag{3}$$

Figure 4: The overall structure of DNMSVM.

However, the objective function of DNMSVM can be expressed as

$$L_D = \min_{\substack{\mathbf{W}^j, \mathbf{b}^j, \xi_i \\ 1 \le j \le r+1, \le \le l \le N}} \frac{1}{2} \mathbf{W}^{r+1^2} + C \sum_{l=1}^N \xi_l^2. \tag{4}$$

It can be equivalent to the following unconstrained optimization problem:

$$L_D = \min_{\theta'} \frac{1}{2} \left\| \mathbf{W}^{r+1} \right\|^2 + C \sum_{l=1}^N \left[\max \left(1 - y^l \left(\mathbf{W}^{r+1} \Phi \left(\mathbf{x}^l \middle| \theta \right) + b^{r+1} \right), 0 \right) \right]^2. \tag{5}$$

Therefore, DNMSVM can be trained without the use of kernel tricks. This is different from support vector machines that use known kernel functions to implicitly define kernel mappings, which require kernel tricks in the usual solution. The joint training of DNMSVM is a new algorithm that takes into account the influence of the classification results of the support vector machine on the features extracted by the subnetworks. Therefore, it has advantages over the separate training of NEUROSVM.

3.2. Cross-Connected Convolutional Neural Network. In the standard convolutional neural network, each hidden layer can only obtain the input from its adjacent previous layer and then transfer its output to the adjacent next layer. This not only limits the flexibility of convolutional neural network structure but also makes it inconvenient to comprehensively use its multiscale features. In this chapter, a cross-connected convolutional neural network model is established by adding a cross-layer connection to the traditional convolutional neural network. The learning parameters in a convolutional network are reduced in association with target calibration in YOLO algorithm and also the transformation function. This generalizes the convolution and also reduces the volume of the model without affecting the high-dimensional feature capturing capability. In this model, a convolutional neural network uses two-scale features for classification. The calculation process formula of a cross-connected convolution neural network is as follows.

$$\mathbf{h}_{1,j}^l = \sigma \left(\mathbf{u}_{1,j}^l \right) = \sigma \left(\mathbf{x}^l * \mathbf{W}^{1,j} + \mathbf{b}^{1,j} \right), 1 \le j \le 6, \tag{6}$$

$$\mathbf{h}_{2,j}^l = g \left(\mathbf{u}_{2,j}^l \right) = g \left(\mathrm{down}_{\lambda,\tau} \left(\mathbf{h}_{1,j}^l \right) \right), 1 \le j \le 6. \tag{7}$$

The objective function of optimization is the mean square error of all samples, and the mathematical expression is as follows.

$$L_N = \frac{1}{2} \sum_{l=1}^N \sum_{n=1}^c \left(o_n^l - y_n^l \right)^2. \tag{8}$$

Therefore, the feedback transmission error of this layer is the sum of the two parts. The calculation method of feedback transmission error of other layers is the same as that of CNN. The mathematical expression of the feedback transfer error matrix of each layer is as follows.

$$\delta_8^l = \left(\mathbf{o}^l - \mathbf{y}^l \right) \circ \sigma' \left(\mathbf{u}_8^l \right), \tag{9}$$

$$\delta_7^l = \left[\left(\mathbf{W}^8 \right)^T \delta_8^l \right] \circ \mathbf{h}_7^l \circ \left(1 - \mathbf{h}_7^l \right), \tag{10}$$

$$\delta_7^l = \left(\delta_{41,1}^l, \delta_{41,2}^l, \cdots, \delta_{41,12}^l, \delta_{6,1}^l, \delta_{6,2}^l, \cdots, \delta_{6,16}^l \right). \tag{11}$$

After the feedback transfer error of each layer is obtained, the partial derivatives of weight and bias can be calculated as follows.

$$\frac{\partial L_N}{\partial \mathbf{W}^8} = \sum_{l=1}^N \delta_8^l \left(\mathbf{H}_7^l \right)^T, \frac{\partial L_N}{\partial \mathbf{b}^8} = \sum_{l=1}^N \delta_8^l, \tag{12}$$

$$\frac{\partial \mathbf{L}_N}{\partial \mathbf{W}^{5,j}} = \sum_{l=1}^N \mathbf{h}_{4,j}^l \approx \delta_{5,j}^l, \frac{\partial \mathbf{L}_N}{\partial \mathbf{b}^{5,j}} = \sum_{l=1}^N \delta_{5,j}^l, 1 \le j \le 16, \tag{13}$$

$$\delta_{1,j}^l = \frac{1}{\lambda \times \tau} \left(\sigma' \left(\mathbf{u}_{1,j}^l \right) \circ up_{\lambda \times \tau} \left(\delta_{2,j}^l \right) \right), 1 \le j \le 6. \tag{14}$$

Finally, the gradient descent method is used to update the weight and bias of the network. In order to simplify the selection of spanning structures, this chapter proposes a splicing framework of spanning convolutional neural networks, in which binary spanning indicators are used to express different splicing situations, which can flexibly express different spanning structures. The motivation of this chapter is to integrate multiscale features through multiple cross-layer connections with inherently fixed weights. The
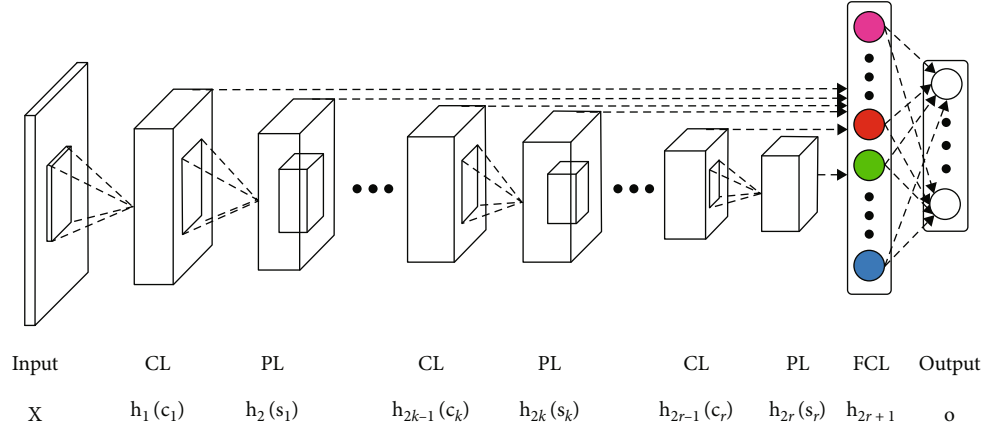
FIGURE 5: The splicing framework of convolutional neural network.

TABLE 1: The disadvantage of the development of dragon and lion sports in China.

Inferiority	Total	Mean value	Standard deviation	Sort
Research lag	60	4.4349	0.73675	1
Lack of teachers	60	4.2452	0.80128	2
Unbalanced development	60	3.7812	0.97360	3
Perfect technical system	60	3.7167	1.0132	4
Low degree of marketization	60	3.6544	1.4675	5

FIGURE 6: The disadvantage of the development of dragon and lion sports in China.

splicing framework of the convolutional neural network is shown in Figure 5.

The calculation of convolution layer can be expressed as

$$\mathbf{h}_{2k-1,j}^{l} = \mathbf{c}_{k,j}^{l} = f\left(\mathbf{u}_{2k-1,j}^{l}\right) = f\left(\sum_{i} \mathbf{h}_{2k-2,i}^{l} * \mathbf{W}_{ij}^{2k-1} + \mathbf{b}_{j}^{2k-1}\right).$$

(15)

In each pool layer, a fixed step size is used for all feature surfaces. The pooling function can be expressed as

$$\mathbf{h}_{2k,j}^{l} = \mathbf{s}_{k,j}^{l} = \text{pooling}\left\{\mathbf{h}_{2k-1,j}^{l}\right\}, 1 \le k \le r.$$

(16)

The full connection layer is the splicing obtained by the activation of two or more convolution layers and pooling layers through cross-layer connection, forming the whole multiscale feature discrimination vector. In fact, the full connection layer has the following forms:

$$\mathbf{h}_{2r+1}^{l} = \left(a_{1}\mathbf{h}_{1}^{l}, a_{2}\mathbf{h}_{2}^{l}, \cdots, a_{2k-1}\mathbf{h}_{2k-1}^{l}, a_{2k}\mathbf{h}_{2k}^{l}, \cdots, \mathbf{h}_{2r}^{l}\right).$$
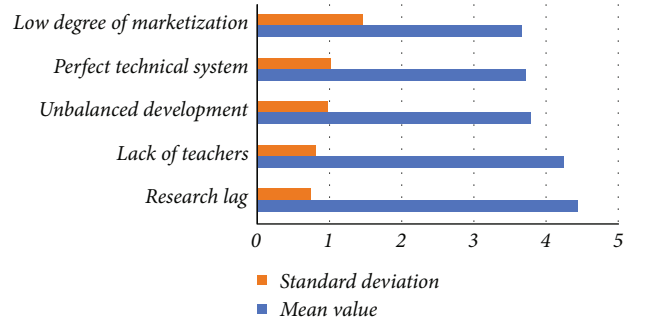
(17)

TABLE 2: Investigation of dragon and lion teachers.

Content		Number of people	Percentage
Professional situation	Traditional sports	20	33%
	Other majors	40	67%
Learning approach	Short-term training	28	47%
	Self-taught	17	28%
	Systematic learning	15	25%
Teaching competence	Competent	25	42%
	Reluctantly	35	58%

The cross-entropy loss is used as the objective function, and the formula is as follows.

$$L_{N}\left(\mathbf{y}^{l}, \mathbf{o}^{l}\right) = -\sum_{l=1}^{N} \sum_{c=1}^{C} y_{c}^{l} \log\left(o_{c}^{l}\right).$$

(18)

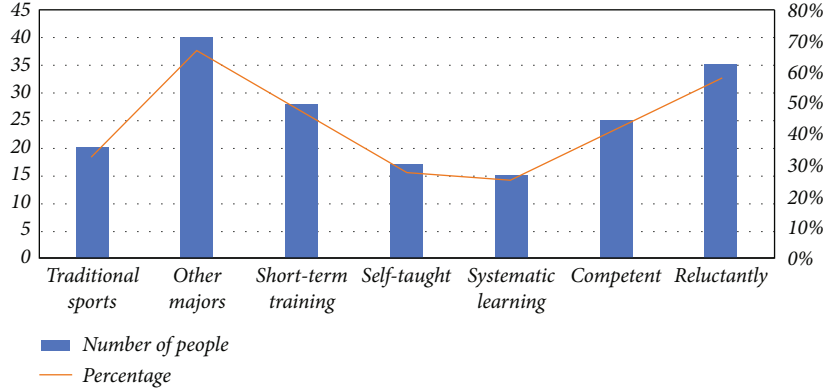The sensitivity of each hidden layer is then calculated as follows.

FIGURE 7: Investigation of dragon and lion teachers.

$$\delta^l_{2k-1,j} = f'\left(\mathbf{u}^l_{k,j}\right) \circ \text{uppooling}\left\{\delta^l_{2k,j}\right\} + a_{2k-1}\delta^l_{2k-1,\text{FC},j}. \quad (19)$$

In this framework, the full connection layer is obtained by splicing one or more convolution layers and pooling layers in front of it by cross-layer connection with fixed weight. The framework aims to use the features of nonhighest convolution layer or pool layer to splice the multiscale features for classification or recognition. However, this algorithm does not take into account the differences between the features of different scales; that is, the cross-layer connection should also have corresponding weights to indicate the importance of the features of different scales.

4. Experiments and Results

Dragon and lion dance culture has a very important impact on the development of college students' dragon and lion dance sports events. Therefore, correctly guiding the development of dragon and lion stadium culture and strengthening the construction of dragon and lion stadium culture will greatly promote the development of Chinese college students' dragon and lion dance events. Although the Dragon and Lion Dance Championships for Chinese college students have only been held for six times, they are unique in the dragon and lion dance in China, with strong development momentum and strong vitality. This is largely due to the unique resource advantages of colleges and universities. Through the questionnaire survey of dragon and lion sports experts, coaches, athletes, and project managers, the relevant data on the development status and advantages of dragon and lion sports in China are collected after data processing. The disadvantage analysis of the development of dragon and lion sports in China is shown in Table 1 and Figure 6.

The competitive time of dragon and lion dance is not long, and there are few opportunities for college teachers and students to contact this sport. The time is also short. Compared with other competitive events, the overall level of referees of dragon and lion dance is relatively poor. Insufficient attention to the cultural connotation of dragon and lion dance is difficult to improve the level of dragon and lion dance. The survey of dragon and lion teachers is shown in Table 2 and Figure 7.

The results from the survey data of the coaches and school teachers in Table 2 and Figure 7 show that the teacher strength of dragon and lion dance is relatively weak, of which 67% of the coaches and teachers are other majors who also teach and train dragon and lion dance, and 58% of the teaching competence is barely competent, which obviously reflects that the professionalism of dragon and lion dance is not strong and lacks relevant theoretical knowledge and practical operation ability, which will greatly affect the sustainable development of the dragon and lion sport project. From the survey and analysis results, the geographical distribution of colleges and universities joining the Chinese college students' Dragon and Lion Dance Association is uneven, and few teams insist on participating in each competition. Referees have a high level of education, but few have experience in dragon and lion dance, and their scientific research ability needs to be strengthened. Standardize the qualification of Chinese college students for dragon and lion dance events, improve the enthusiasm of all sports teams, and promote the better and faster development of competitive dragon and lion dance according to the principles of fairness and fairness of sports competitions.

5. Conclusion

The rapid change of everything changes with the change in the environment. With the change in the social environment and the improvement of economic development, the development of folk traditional sports, dragon and lion sports, has a bottleneck. With the help of big data technology, this paper makes a systematic, objective, and rational analysis of the development of dragon and lion sports in China and uses the method of in-depth learning to identify its advantages and disadvantages, opportunities, and threats in the development of dragon and lion sports in China. It is conducive to disseminating ideas, adopting correct development strategies, and occupying a place in the diversified, competitive sports world. Only by adapting to the trend of social development and the law of economic growth, developing strengths, and avoiding weaknesses can China's dragon and lion movement realize the sustainable development of modernization. Research lag was identified as one of the

major reasons for the underdevelopment of dragon and lion dance in China.

As a kind of inheritance and innovation of Chinese dragon culture, Chinese dragon dance brings people not only physical pleasure and health but also carries a higher sense of national identity of the Chinese nation. Therefore, based on inheriting and carrying forward the dragon and lion spirit of unity and struggle, cooperation, and enterprising, we should further tap the new flavor and connotation of the times embodied in the dragon and lion movement in the contemporary era and better strengthen the protection, inheritance, and promotion of the dragon and lion culture. At the same time, significant events at home and abroad enable domestic high-level athletes to create more opportunities for exchanges with foreign countries, increase understanding with countries, promote dragon and lion cultural exchanges, and enhance the sense of traditional cultural identity. Therefore, give full play to the leverage and service function of the competition, guide the scientific training of dragons and lions to dance, and promote the improvement of the competitive level. As part of future study, similar techniques could be used to analyze other dance forms and activities which are getting obsolete.

Data Availability

The datasets used during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare that they have no conflict of interest.

Acknowledgments

References

[1] Y. Li, H. Wang, and M. Deng, "Exploitation of national fitness project in physical education in middle school," *Advances in Physical Education*, vol. 7, no. 4, pp. 409–417, 2017.

[2] L. C. C. Wang, E. T. C. Lam, and Y. H. Chen, "A case study of using the smart board as a Chinese learning application by elementary school students," *International Journal of Technology Enhanced Learning*, vol. 11, no. 1, pp. 71–79, 2019.

[3] A. E. Selase, "A multicultural comprehension of traditional dancing in Ghana and China: a genealogical analysis," *American International Journal of Humanities, Arts and Social Sciences*, vol. 1, no. 2, pp. 81–88, 2019.

[4] J. Tao and J. Yin, "A study on Chinese traditional culture education in China's kindergartens," *International Journal of Humanities Social Sciences and Education*, vol. 3, no. 4, pp. 59–66, 2017.

[5] M. Schneider, "Dragon head enterprises and the state of agribusiness in China," *Journal of Agrarian Change*, vol. 17, no. 1, pp. 3–21, 2017.

[6] T. Nakamura, "The interplay of political and existential freedom in Earl Lovelace's the dragon can't dance," *Journal of West Indian Literature*, vol. 23, no. 1-2, pp. 35–46, 2015.

[7] B. Chang, "The re-socialisation of migrants in a local community in Shanghai, China," *International Review of Education*, vol. 61, no. 2, pp. 211–233, 2015.

[8] X. Ma, R. Wang, M. Dai, and Y. Ou, "The influence of culture on the sustainable livelihoods of households in rural tourism destinations," *Journal of Sustainable Tourism*, vol. 29, no. 8, pp. 1235–1252, 2021.

[9] Y. Zhou, J. Sun, and Y. Huang, "The digital preservation of intangible cultural heritage in China: a survey," *Preservation, Digital Technology & Culture*, vol. 48, no. 2, pp. 95–103, 2019.

[10] R. R. Mellecker, "Hidden dragon: research findings from Asia in games for health," *Games for health journal*, vol. 4, no. 3, pp. 159-160, 2015.

[11] P. Pawelec, J. Słopecki, L. Sieber, and P. Rut, "Scientific and martial arts' tourism. The case study of the 3rd IMACSSS International Conference and Congress," *IDO Movement for Culture. Journal of Martial Arts Anthropology*, vol. 1, no. 15, pp. 46–56, 2015.

[12] Y. S. Ng, "Pride versus prudence: the precarious queer politics of pink dot," *Inter-Asia Cultural Studies*, vol. 18, no. 2, pp. 238–250, 2017.

[13] M. Prendergast, "Tracing the journey to here: reflections on a prison theatre devised project," *Theatre Topics*, vol. 26, no. 3, pp. 343–349, 2016.

[14] B. Hauck, "The shared time of the mass line: economics, politics and participation in a Chinese village," *Javnost-The Public*, vol. 27, no. 2, pp. 186–199, 2020.

[15] Y. Li, C. Yurong, and W. Xiaoxu, "Documentary analysis on scientific research condition of dragon and lion dance in our country in recent thirty years visualization based on scientific knowledge map," *Journal of Guangzhou Sport University*, vol. 38, no. 6, pp. 81–84, 2018.

[16] E. Z. Marshall, M. Farrar, and G. Farrar, "Popular political cultures and the Caribbean carnival," *Soundings*, vol. 67, no. 67, pp. 34–49, 2017.

[17] C. Chun and W. Z. Yin, "Mathematical statistics-based university students' physical health conditions and teaching

strategies study," *Eurasia Journal of Mathematics, Science and Technology Education*, vol. 13, no. 10, pp. 7077–7088, 2017.

[18] C. C. M. Sung, "Hong Kong English: linguistic and sociolinguistic perspectives," *Language and Linguistics Compass*, vol. 9, no. 6, pp. 256–270, 2015.

[19] N. M. Talaat and K. A. E. Rashwan, "Success factors of hallmark events: the case of Vietnam," *Journal of Association of Arab Universities for Tourism and Hospitality*, vol. 15, no. 3, pp. 79–84, 2018.

[20] C. S. Fong, D. DeWitt, and C. H. Leng, "The analysis of cultural and intercultural elements in Mandarin as a foreign language textbooks from selected Malaysian public higher education institutions," *MOJES: Malaysian Online Journal of Educational Sciences*, vol. 6, no. 1, pp. 66–90, 2018.

[21] E. J. Z. Zobel Marshall, M. Farrar, and G. Farrar, "Popular political culture and the Caribbean carnival," *Soundings: A Journal of Politics and Culture*, vol. 67, pp. 34–49, 2017.

[22] T. Tanasaldy, "A decade after the reform: political activism of the Chinese of West Kalimantan, Indonesia," *Indonesia. Asian Ethnicity*, vol. 16, no. 4, pp. 446–479, 2015.

[23] J. Kaplan, "Dancing with the dragon: orality and (body) language (s) in a live performance of Beowulf," *Nordic Theatre Studies*, vol. 28, no. 2, pp. 36–55, 2017.

[24] S. Liu, "The Chinese dance: a mirror of cultural representations," *Research in Dance Education*, vol. 21, no. 2, pp. 153–168, 2020.

[25] N. Yu, Y. Zhai, Y. Yuan, and Z. Wang, "A bionic robot navigation algorithm based on cognitive mechanism of hippocampus," *IEEE Transactions on Automation Science and Engineering*, vol. 16, no. 4, pp. 1640–1652, 2019.

[26] Y. Zhang, T. Huang, and E. F. Bompard, "Big data analytics in smart grids: a review," *Energy informatics*, vol. 1, no. 1, pp. 1–24, 2018.

[27] H. Alsghaier, M. Akour, I. Shehabat, and S. Aldiabat, "The importance of big data analytics in business: a case study," *American Journal of Software Engineering and Applications*, vol. 6, no. 4, pp. 111–115, 2017.

[28] A. Gandomi and M. Haider, "Beyond the hype: big data concepts, methods, and analytics," *International Journal of Information Management*, vol. 35, no. 2, pp. 137–144, 2015.

[29] V. Brock and H. U. Khan, "Big data analytics: does organizational factor matters impact technology acceptance?," *Journal of Big Data*, vol. 4, no. 1, pp. 1–28, 2017.

[30] S. Mumtaz, H. Lundqvist, K. M. Saidul Huq, J. Rodriguez, and A. Radwan, "Smart Direct-LTE communication: an energy saving perspective," *Ad Hoc Networks*, vol. 13, pp. 296–311, 2014.

[31] C. W. Tsai, C. F. Lai, H. C. Chao, and A. V. Vasilakos, "Big data analytics: a survey," *Journal of Big data*, vol. 2, no. 1, pp. 1–32, 2015.

[32] W. L. Liao, C. Y. Yao, and Y. P. Yang, "Efficiency of financial holding and non-financial holding bank in Taiwan: an application of meta-frontier Malmquist productivity gap index," in *In International Conference on Frontier Computing*, pp. 1–9, Springer, Singapore, 2019.

[33] Y. Li and T. Zhang, "Deep neural mapping support vector machines," *Neural Networks*, vol. 93, pp. 185–194, 2017.

[34] B. Gong, J. Shi, S. Ying et al., "Neuroimaging-based diagnosis of Parkinson's disease with deep neural mapping large margin distribution machine," *Neurocomputing*, vol. 320, pp. 141–149, 2018.

[35] N. Singh, V. K. Gunjan, G. Chaudhary, R. Kaluri, N. Victor, and K. Lakshmanna, "IoT enabled HELMET to safeguard the health of mine workers," *Computer Communications*, vol. 193, pp. 1–9, 2022.

[36] G. T. Reddy, M. P. K. Reddy, K. Lakshmanna et al., "Analysis of dimensionality reduction techniques on big data," *IEEE Access*, vol. 8, pp. 54776–54788, 2020.