

## *Retraction*

# **Retracted: Forecast Analysis of the Overall Structure Characteristics and Development Potential of the Sports Industry Based on Wireless Communication Networks**

### **Wireless Communications and Mobile Computing**

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*Wireless Communications and Mobile Computing* has retracted the article titled “Forecast Analysis of the Overall Structure Characteristics and Development Potential of the Sports Industry Based on Wireless Communication Networks” [1] due to concerns that the peer review process has been compromised.

Following an investigation conducted by the Hindawi Research Integrity team [2], significant concerns were identified with the peer reviewers assigned to this article; the investigation has concluded that the peer review process was compromised. We therefore can no longer trust the peer review process and the article is being retracted with the agreement of the chief editor.

### **References**

- [1] Y. Zhang and J. Yang, “Forecast Analysis of the Overall Structure Characteristics and Development Potential of the Sports Industry Based on Wireless Communication Networks,” *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 5487681, 10 pages, 2022.
- [2] L. Ferguson, “Advancing Research Integrity Collaboratively and with Vigour,” 2022, <http://www.hindawi.com/post/advancing-research-integrity-collaboratively-and-vigour/>.

## Research Article

# Forecast Analysis of the Overall Structure Characteristics and Development Potential of the Sports Industry Based on Wireless Communication Networks

Youyun Zhang<sup>1</sup> and Jing Yang<sup>2</sup> 

<sup>1</sup>College of General Education, Chongqing Business Vocational College, Chongqing, 401331 Sichuan, China

<sup>2</sup>Physical Education Department, Southwest University of Political Science & Law, Chongqing, 401120 Sichuan, China

Correspondence should be addressed to Jing Yang; yangjing@swupl.edu.cn

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With the continuous development of China's social economy, China's sports industry has also continued to develop nowadays and has been increasingly noticed. Although the sports industry has achieved great improvement in recent years, compared with the sports industry in developed countries, the development of China's sports industry is still in a relatively weak state. The consumption of China's sports industry does not account for a high proportion of GDP. However, with the improvement of people's income level and quality of life, as well as the improvement of the quality of the national group, people consume increasingly sports products. The sports market continues to expand and becomes more diversified, providing good conditions for the development of China's sports industry. Forecasting the improvement potential of China's sports industry has also become a hot research topic in recent years. Based on the characteristics of the structure of China's sports industry and the status quo of the industry's development, this paper was aimed at researching the prediction of the improvement potential of the sports industry based on radio communication networks. The article combines the time series prediction algorithm and SVM regression algorithm under the radio spectrum prediction technology to forecast and analyze the development potential of China's sports industry. The conclusion is that the prediction accuracy rate of China's sports industry development potential based on radio communication spectrum prediction technology is 90%, which shows that the prediction of the development potential of sports industry based on radio communication network is relatively accurate and effective.

## 1. Introduction

From sports fitness to sports advertising, sports event tickets from sports apparel, the production of sports goods and sports functional drinks, and then the development of sports tangible and intangible industries such as stadiums, the sports industry has integrated into people's daily life in all aspects and has also been integrated into the commodity market economy. For any country, the development of the sports industry also means the development of the tertiary industry, and it also means that the country's economic structure has changed. At present, the improvement of the sports industry and the expansion of the sports market have surpassed any period in the past. The sports industry has

also become an important part of the national economy. The development of the sports industry plays an important role in promoting the country's social and economic improvement and improving the national physical fitness. As a sunrise industry, China's sports industry has a good momentum of development and a bright future, but it still has a certain gap with other countries. The gap is specifically manifested in the growth quota of the sports industry and the contribution rate of the sports industry to the national economy. The advantages and potential of the sports industry need to be further tapped. At present, the total value of the sports industry in the whole world is about 400 billion U.S. dollars, and this number can keep the growth speed of 20% every year. The sports industry has been already a

new development point in the national economy of developed countries. Although the development of China's sports industry started late, it has achieved good and sustained development. And the sports industry has broad market prospects and development potential. With the development of China's society and economy, and the continuing upsurge of national sports and fitness, the Chinese sports market has shown large demand. People's consumption of sporting goods is also increasing.

People's main consumption areas of the sports industry are shown in Figure 1:

In recent years, China's sports competition market has become increasingly active, and the rise of sports fever will surely promote the further improvement of the sports industry. This is because the sports craze will greatly increase people's interest in sports activities, thereby stimulating the production and consumption of some sports products, thereby promoting the further development of the sports industry. In the future, increasingly world-class sports events will be held in China, and increasingly, people will take part in sports and fitness activities. Today, some large international companies and domestic companies have invested in China's sports industry. In the future, China's sports industry will also attract more and more domestic and foreign investment, which will play a greater role in the development of China's national economy and the improvement of people's living standards.

We can visually see the development of the sports industry in recent years through data. The growth rate of China's sports industry from 2015 to 2019 is shown in Table 1:

From the table, we can clearly see that from 2015 to 2019, China's sports industry has shown a good momentum of continuous positive growth. With the development of China's sports industry, many studies on China's sports industry have also emerged in academic circles.

Among them, Yang studied the growth law of China's sports industry from the angle of big data, analyzed the feasibility of sports industry growth prediction based on big data theory, and proposed a sports industry growth forecast model based on genetic neural network [1]; Hu studied the trend of changes in consumption and turnover of China's sports industry and provided some references for predicting the future improvement trend of China's sports industry [2]; Qianying's research aims to illustrate the characteristics of community sports clubs and to study the organizational culture of community sports clubs in Japan and China. In the experimental investigation part of their research, they interviewed 400 coaches from 10 sports clubs in Tokyo and Shanghai and received effective answers from 139 Japanese and 128 teaching plans in Shanghai. Their survey project conducted an exploratory factor analysis of the organizational culture of sports clubs, including 3 economic and social factors and 3 guidance opportunity factors, and the biggest influence factor in the organizational culture of sports clubs in Japan and China [3]; Fei and Wu studied the overall improvement of the sports industry through the "Twelfth Five-Year Plan" (2011-2015) and revealed its main achievements, such as scale expansion and diversification of products and services. At the same time, they also analyzed the mechanism and system



FIGURE 1: Major consumption areas of the sports industry.

reform, structural upgrade and layout, product quality improvement of China's sports industry, and the optimization of talent supply [4]; Junior and Rodrigues specifically analyzed the development plan of a branch of the Chinese sports industry the football industry and analyzed the impact of new policy tools on the power relations in the football field and the challenges that China faces to promote the development of sports [5]; Zhou et al. conducted a case study of the NBA that has achieved great success in the Chinese sports industry market. By summarizing the development history of NBA in China and analyzing its marketing strategy and promotion practices, it provides references for the development of China's sports industry [6]. Although the above studies are all related to China's sports industry, the study perspectives and research content are not comprehensive enough, and they do not involve research on the development trend prediction of China's sports industry. The innovation of this article is as follows: (1) It lies in the prediction and analysis of the future improvement trend of China's sports industry based on the analysis of the characteristics of China's recent sports industry structure and the radio communication spectrum prediction method. (2) Time series prediction algorithm and SVM regression algorithm are used to predict and analyze the development potential of the sports industry.

## 2. Prediction Methods for the Development Potential of the Sports Industry

### 2.1. Overview of China's Current Sports Industry Development

**2.1.1. The Gap between China's Sports Industry and Developed Countries Is Narrowing.** Although the development of the sports industry started relatively late, after more than 30 years of development, China's sports industry is now becoming increasingly brilliant. China's sports industry has obtained a good development trend since 1997, and the gap with developed countries is gradually narrowing. Specifically, the gap in the annual growth value of the industry and its contribution to the national economy has narrowed. Although the total output value of China's sports industry at this stage is still unable to match that of developed countries, it has not even been among the top domestic industries. However, as a sunrise

TABLE 1: 2015-2019 China's sports industry growth rate list.

Category	2015 growth (100 million yuan)	2016 growth speed	2017 growth speed	2018 growth speed	2019 growth speed
Sports fitness and leisure activities	982	22.83%	16.5%	18.78%	13.14%
Sports intermediary activities	74.8	16.35	28.82%	31.20%	6.25%
Sports training	18.24	22.91%	27.35%	25.7%	16.5%
Sports lottery	46.3	21.85%	24.2%	68.1%	66%
Sporting goods	21.45	34.8%	16.52%	11.2%	13.2%

industry in China, the sports industry has been already a new increase point for China's national economy and has great development potential. The successful hosting of the 2008 Beijing Olympics means that China's sports industry has come into a new stage of development. Since then, China's sports industry, infrastructure construction, and national fitness awareness have been significantly improved. The successful hosting of the Beijing Olympics undoubtedly provides a large and rare opportunity for the development of China's sports industry, and China's sports industry has achieved unprecedented progress and development [7].

*2.1.2. China Has Formed an Increasingly Complete Sports Market System.* The sports market is a market carrier for the production, circulation, and consumption of various tangible or intangible sports products. The improvement of the sports industry may have a close relationship with the prosperity and improvement of the sports market. It can also be said that there will be no improvement of the sports industry without the increase of the sports market. Therefore, to ensure the rapid and healthy development of the sports industry, it is inseparable from the establishment and improvement of a reasonable structure and a complete sports market system. With the continuous development of China's economy and the continuous in-depth reform of the market economy system, the reform of the sports industry has also continued to deepen, and the sports market has changed from the previous nondiscriminatory, monolithic production and management to the main body of sports, a form in which multiple economic components coexist and all fields go hand in hand. Based on the sports fitness and leisure entertainment market, and supplemented by the sports goods market, sports lottery market, sports media market, sports brokerage market, and sports tourism market, a more complete sports market system has been formed [8].

*2.1.3. The Consumption Potential of China's Sports Market Continues to Grow.* Since the formation and improvement of the sports industry, the consumption of sports products has become a basic aspect of mass consumption. The consumption of sports is the product of China's social and economic development to a certain stage. It is a choice made in pursuit of individual development and enjoyment when people's material living conditions basically meet people's life needs. It is a new type of consumption based on people's subjective understanding of the function of sports. According to the external manifestations, sports consumption can be divided into sports goods consumption, sports informa-

tion consumption, and sports labor consumption. As people's production pace accelerates, the social development trend of increasing leisure time, and the awareness of national fitness, gains roots in the hearts of the people. To pursue a higher quality of life, people's enthusiasm for sports activities is bound to rise, and most sports practice activities cannot be separated from sports consumption, such as consumption of sports equipment and other sports goods and stadiums. In particular, the consumption of sporting goods from popular brands has only increased, such as Hongxing, Erke, and Li Ning. Consumption in various fields of the sports industry also means that China's sports market has huge consumption potential, and it also means that China's sports industry has a good development in the future [9].

*2.2. Characteristics of China's Current Sports Industry Structure.* China's sports industry is a sports industry group composed of many industrial chains, including sports competitions, sports performance, sports intermediaries, and sports goods. Each of these subindustries is composed of different organizations and enterprises and maintains the necessary close ties with external industries. At the same time, there are internal relations among the sports industry. And the extensive and complex relationship with the external structure is the dynamic foundation of the structure of the sports industry, and it is also the basic element of the characteristics of China's current sports industry structure. From a business angle, the sports industry includes not only organizations and individuals engaged in nonprofit activities but also nonprofit activity organizations, such as schools or government administrative sports management departments; from the perspective of organizational scale, although China currently has a large-scale and core competitiveness of sports enterprises, there are relatively few such enterprises, and the number of small sports enterprises is clearly more. From the perspective of industrial operation models, there are sports league models and club models, as well as chain models and intermediary service models. From the angle of the relationship of industrial structure, the level of organizational structure relationship of China's sports industry is relatively low. The specific manifestations are fragmented organization, inadequate connections, and lack of overall synergy, which will affect the overall improvement of the structure and efficiency of the sports industry. In addition, from the angle of the industrial management system, organizational structure, and capital allocation, the sports industry at the present stage is in urgent need of improvement. From the perspective of various regions across the country, the eastern, central, and western regions have obvious gradient development; that



is, the level of regional sports development in China is quite different, the regional coordination work system is still not sound enough, and the level of cooperation between regions urgently needs to be improved [10]. In addition, from the angle of the level of the sports industry alone, there is a certain degree of imbalance between the proportions of the various levels of the sports industry. From 2016 to 2018, the growth data of the sports industry at different levels is shown in Table 2.

In general, although the sports industry of China has a good momentum of development and a rich industrial chain, there is still a problem of uneven development of the industrial structure. The characteristics of China's current sports industry structure and the problems that exist in it have a certain reference role for the prediction of the development potential of China's sports industry.

### 2.3. Spectrum Prediction Technology for Radio Communication Network

**2.3.1. Radio Communication Network.** Radio communication technology is the use of radio waves to transmit sound, images, text, data, and other information that the sender needs to send to the receiver through spatial information transmission and in accordance with the requirements to help the sender and receiver information exchange and transmission of advanced communication science and technology. The biggest advantage of radio communication technology is that it uses radio waves to realize convenient and quick spatial information transmission, which eliminates the difficulty of laying wires in traditional wired electrical technology. With its technical advantages, radio communication technology helps people realize convenient, fast, and barrier-free spatial information exchange and communication. Since its inception, radio communication technology has been growing for a long time and has been applied increasingly in industries, such as satellite, mobile, radio, navigation, and radio measurement. With the continuous improvement of science and technology, radio communication technology will also continue to develop and improve, to better benefit people's space communication life [11].

The radio communication network technology is shown in Figure 2:

#### 2.3.2. Radio Spectrum Prediction Algorithm

**(1) Time Series Forecasting Algorithm.** Prediction or regression belongs to the type of radio communication supervised learning. Time series prediction algorithm is a representative prediction algorithm under radio communication spectrum prediction technology. In the time series forecasting algorithm, the forecasting model represents the mapping function from input variables to output variables [12]. For a given training data set,

$$T = \{(a_1, b_1), (a_2, b_2), \dots, (a_n, b_n)\}. \quad (1)$$

Among them,  $T$  stands for training data set,  $a_1 \in R^n$  is the input variable, and the output value is  $b \in R$ . The prediction process is the process of constructing a prediction system or function  $b = f(x)$  based on the training data. In the prediction process, for the new input  $a_{n+1}$ , the prediction

TABLE 2: 2016-2018 China's sports industry growth value at different levels.

	2016 growth value	2017 growth value	2018 growth value
Core layer	456.9	621.3	892.9
Outer layer	143.1	145.7	136.6
Related industries	2450.6	2771.5	3105.2
Total	3201.2	3234.1	4132.4

system is based on the learned model  $b = f(x)$ . Then, determine that the corresponding output is 5. This process is shown in Figure 3:

Among them, the model function refers to the conditional probability distribution or decision function obtained by learning according to the training data. How to learn how to specifically reflect the definition of the loss function is discussed, that is, the degree of error between the predicted value  $f(x)$  and the true value  $Y$ , denoted as  $L(Y, f(x))$ . The commonly used loss functions used to describe time series prediction algorithms are as follows [13]:

$$L(y, f(x)) = (y - f(x))^2. \quad (2)$$

The absolute value loss function is as follows:

$$L(f(x), y + 1) = |y - f(x)|. \quad (3)$$

The loss function is a function of calculating the discrepancy between the expected value of the model and the true value. The loss function of the same category reflects the difference between the predicted value of the model and the real value from different angles. The smaller the difference, the more accurate the predicted value of the model obtained by training. The expectation of the loss function can be defined as  $x(i)$ ; then first,

$$G_{\text{exp}} f = E_p\{L(y, f(x))\}. \quad (4)$$

Finally,

$$G_{\text{exp}} = \int_{x,y} L(y, f(x)) p(x, y) dx dy. \quad (5)$$

Among them,  $p(x, y)$  represents the joint distribution of random variables  $(x, y)$ .  $R_{\text{exp}}(f)$  is the loss in the average sense of the theoretical model  $f(x)$  about the joint distribution  $p(x, y)$ , which is defined as a risk function. However, since we cannot know the joint distribution  $p(x, y)$  in advance,  $R_{\text{exp}}(f)$  cannot be directly calculated. In practical applications, the expected loss function value of the training data set is generally calculated. Use the average loss value to approximate the risk function and record it as empirical risk  $R_{\text{exp}}(f)$ :

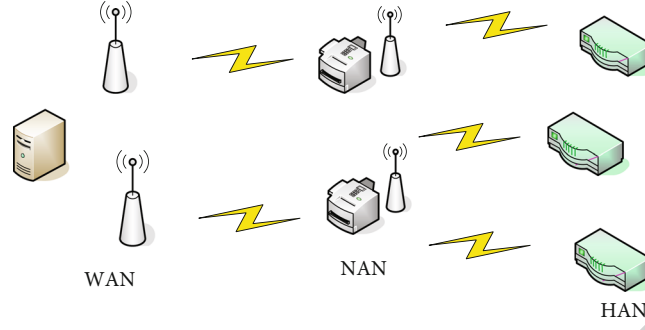


FIGURE 2: Radio communication technology architecture.

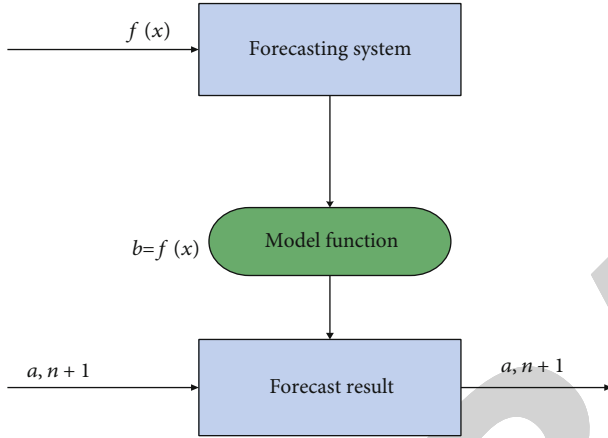


FIGURE 3: Time series algorithm flow.

$$R_{\text{exp}}(f) = \frac{1}{n} \sum_{i=1}^n L(y, f(x_i)). \quad (6)$$

According to the law of large numbers, when the training sample set is large, that is,  $n$  tends to infinity, the empirical risk is similar to the expected risk. Therefore, empirical risk is often used to estimate the expected risk in practical applications. However, due to the inadequate limitation of training data samples, only using empirical risk assessment, the expected risk often leads to a decline in speculation ability, prone to overfitting, or the model is too complex [14]. The structural risk minimization introduces a regularization term on the basis of the empirical risk term, which balances the weight ratio of empirical risk and function complexity, as shown in publicity (7)

$$R_{\text{strm}} = \frac{1}{n} \sum_{i=1}^n L(y_i, f(x_i)) + \beta(f). \quad (7)$$

Among them is the complexity of the function model; the larger it is, the more complex the model; on the contrary, it is simpler. Among them, it is used to weigh the empirical risk and the complexity of the function. The model with low structural risk can better balance and generalize the predic-

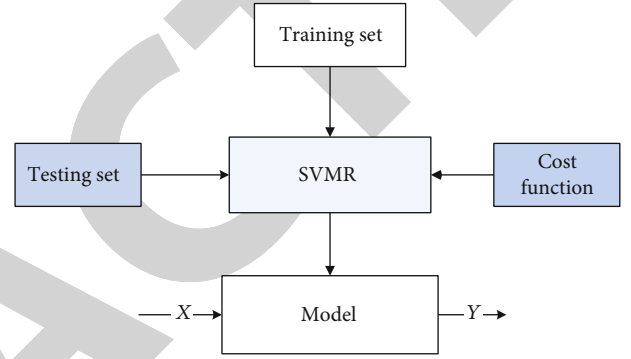


FIGURE 4: Flow chart of SVM regression algorithm.

tive ability of the model to unknown data, avoids the problem of simulation overfitting, and is a more scientific algorithm optimization goal [15].

(2) *SVM Regression Algorithm*. The SVM regression algorithm is a radio spectrum prediction algorithm corresponding to the time series prediction algorithm. It uses linear function calculations to perform reprocessing on the results of the time series forecasting algorithm to obtain the best value. The basic flow of the SVM regression algorithm is shown in Figure 4:

In SVM, the input vector is  $S = \{x_i, y_i\}$ ; among them,  $i = 1$  is the  $M$ -dimensional output vector,  $a$  is the one-dimensional output vector, and  $N$  is the number of samples. The purpose of the SVM algorithm is to find a linear function and estimate the linear function in the high-dimensional feature space, as shown in formula (8):

$$f(x) = \mu\varphi(x) + b. \quad (8)$$

Among them,  $\varphi(x)$  is the nonlinear mapping function,  $\mu$  is the normal vector, and  $b$  is the offset. According to the principle of minimizing structural risk and the principle of maximizing the geometric intervals, the solution to the above problems can be derived and simplified to describe the following problems:

$$\text{Min } \frac{1}{2} \|\omega\|^2 + C \sum_{i=1}^k (x_i + y_i). \quad (9)$$

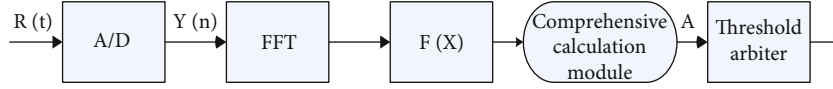


FIGURE 5: Schematic diagram of SVM regression algorithm.

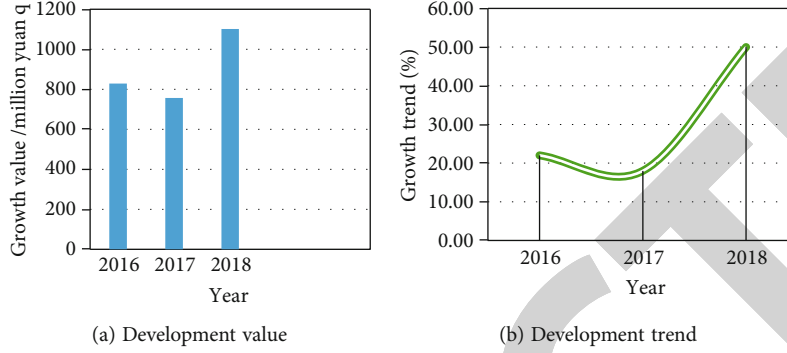


FIGURE 6: China's 2016-2018 comprehensive development data.

Among them,  $x_i, y_i$  is the relaxation factor;  $\omega$  and  $b$  are the parameters to be estimated;  $C$  is the penalty factor (a function to calculate the weighted value of the objective function conditional constraint). Introduce Lagrange function to solve this optimization problem:

Firstly,

$$L = (\omega, b, x_i + y_i). \quad (10)$$

And then, get

$$L = \frac{1}{2} \|\omega\|^2 + C \sum_{i=1}^k (x_i + y_i). \quad (11)$$

The next step is

$$L = - \sum_{i=1}^k [\varepsilon + x_i + y_i - (\varphi(x_i) + b)]. \quad (12)$$

Finally,

$$L = - \sum_{i=1}^k a_i [\varepsilon + x_i - y_i + (\rho_i + b)]. \quad (13)$$

The condition on KKT is as follows:

$$\frac{\partial L}{\partial b} = \sum_{i=1}^k (a_i - x_i) = 0. \quad (14)$$

The dual form is

$$\text{Min } \frac{1}{2} \sum_{i=1}^k (a_i - x_i)(a_i - y_i). \quad (15)$$

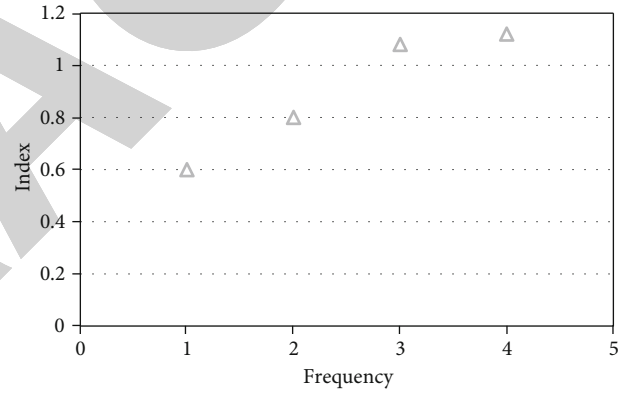


FIGURE 7: China's sports industry development potential prediction index.

Among them, the samples whose  $a_i$  is not 0 play an important role in the parameter prediction of the model and can help predict unknown data more accurately. The principle of SVM regression algorithm is shown in Figure 5:

After mastering the structural characteristics of China's sports industry and understanding the time series prediction algorithm and the principle and calculation process of the SVM regression algorithm, the next step is to start the prediction experiment of China's sports development potential.

**2.3.3. Wireless Communication.** Wireless communication refers to the long-distance transmission communication between multiple nodes without conductor or cable propagation, and wireless communication can be carried out by radio, radio, etc. Wireless communications include a variety of fixed, mobile, and portable applications, such as two-way wireless radios, cell phones, personal digital assistants, and wireless networks. Other examples of radio wireless communication are GPS, garage door remote control, wireless mouse, etc.

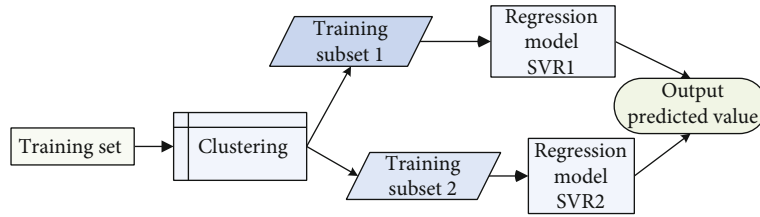


FIGURE 8: Regression algorithm processing flow.

### 3. China's Sports Industry Development Potential Prediction Experiment

**3.1. Experimental Method.** The experimental method for predicting the development potential of China's sports is to collect data on the comprehensive development of the sports industry in China from 2016 to 2018. Then, use time series forecasting algorithm and SVM regression algorithm to carry out the prediction algorithm operation and data processing on the comprehensive development data of the sports industry in China from 2016 to 2018. Then, compare China's 2016-2018 development potential prediction index with China's 2019-2021 sports industry actual development index. Finally, the accuracy of using the time series prediction algorithm and SVM regression algorithm under the radio communication network spectrum prediction technology to forecast the improvement potential of China's sports industry is obtained [16].

First, the use of Internet big data to collect China's comprehensive development data of the sports industry from 2016 to 2018 is shown in Figure 6:

In the above picture, the overall development of the sports industry in 2016-2018 is stable, and the output value increased from 82.89 billion in 2016 to 110.21 billion in 2018. Although the growth value of 2016-2017 has slightly decreased, the overall positive change of the sports industry in China has shown an upward trend in 2016-2018. This overall upward development trend benefits to a certain degree from China's socioeconomic development and the improvement of people's living standards [17].

**3.2. Algorithm Operation and Data Processing.** Next, based on the data obtained above, we first use the time series forecasting algorithm to build a forecasting model from input variables to output variables. Among them, the input variable is the whole development data of the sports industry in China from 2016 to 2018. After many repeated calculations and verifications, the final output variable obtained is the prediction index of China's sports development potential based on the comprehensive improvement data of the sports industry from 2016 to 2018. The increase potential prediction index of the sports industry obtained through the operation of the time series prediction algorithm is shown in Figure 7:

From the above figure, the final preliminary prediction index of the improvement possibility of the sports industry obtained after the operation of the time series prediction

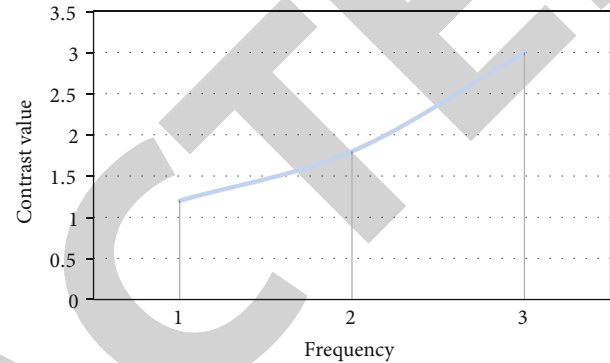


FIGURE 9: Forecast trend of China's sports industry development potential.

algorithm and data processing is 1.12. In the next step, we use the SVM regression algorithm. Combined with the 2016-2018 comprehensive data of the improvement of the sports industry in China, the development potential prediction index is used to improve the shortcomings of this calculation, and the obtained prediction index of the sports industry development potential is further processed by regression calculation. After the regression algorithm is processed, the final prediction index of the increasing potential of China's sports industry is obtained. The processing flow is shown in Figure 8:

Through the two SVR modeling trainings, the predicted values obtained have become increasingly similar. The results obtained after two SVR calculations are the predicted trends of China's sports development potential, as shown in Figure 9:

In summary, after running the time series prediction algorithm, SVM regression algorithm, and data processing, the final prediction trend of China's sports development potential is steadily rising, and the relative trend value is 3. After the linear function calculation, the relative value of the development trend is transformed into the development potential prediction index, and the result is 1.2. It can be seen that there is not much difference between the development potential prediction index obtained by the SVM regression algorithm and the development potential prediction index obtained by the time series prediction algorithm. Therefore, we take the median value of 1.12 and 1.2 as the final prediction index for the improvement potential of the sports industry in China. The main reason for this is that the error of the forecast index can be reduced as much as possible, making the forecast more accurate. The index is positive,



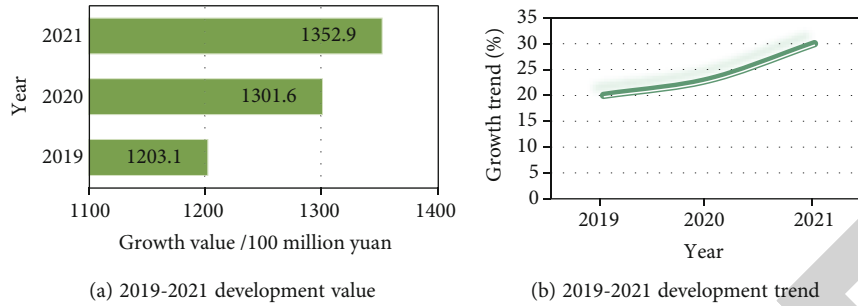


FIGURE 10: 2019-2021 comprehensive development digital of China's sports industry.

which represents a positive development trend, indicating that the forecast of the future potential of the sports industry is a positive development trend of growth [18].

Next is the last step of this experiment: Comparing the final China's sports industry development potential prediction index obtained by the time series prediction algorithm and SVM regression algorithm with the actual comprehensive development index of the sports industry in 2019-2021, we obtained accuracy rate of the prediction of the improvement potential of China's sports industry by using the time series prediction algorithm and SVM regression algorithm under the radio communication network spectrum prediction technology. Figure 10 shows the improvement digital of the sports industry in China from 2019 to 2021:

**3.3. Experimental Summary.** It can be seen from Figure 8 that the development of China's sports industry has shown a steady growth trend from 2019 to 2021. The overall development trend is positive growth. This result can preliminarily show that in the algorithm operation and data processing steps, the development trend judged by the China sports industry development potential prediction index obtained by the time series prediction algorithm and the SVM regression algorithm is accurate. However, the final accuracy and the specific accuracy rate need to be further calculated. Comparing the predicted increase rate of the sports industry from 2016 to 2018 with the growth rate of the sports industry from 2019 to 2021, the prediction accuracy rate is obtained. According to the 2016-2018 sports industry development potential prediction index 1.72, after the linear function index conversion operation [19], it can be concluded that the predicted growth rate for 2016-2018 is 18.3%. The actual growth rate of China's sports industry from 2019 to 2021 can be calculated directly from the growth data. The calculated actual growth rate for 2019-2021 is 16.55%. Therefore, the accuracy rate of using time series prediction algorithm and SVM regression algorithm to forecast the improvement potential of China's sports industry is 90.016%, which is 90%.

This is the end of the experiment, and our conclusion is as follows: Using the time series prediction algorithm and SVM regression algorithm under the radio frequency spectrum prediction technology to predict the growth rate of the improvement potential of the sports industry, the prediction accuracy rate is 90%. The high prediction accuracy rate shows that the use of radio communication spectrum pre-

diction technology to forecast the improvement potential of China's sports industry is more accurate and effective.

In the above experiments, the comprehensive development data of the sports industry in the three years from 2016 to 2018 were first collected, and then, the time series prediction algorithm and SVM regression algorithm were used to process the comprehensive development data of the sports industry in the three years from 2016 to 2018 to obtain the development potential prediction index. Then, compare it with the actual development index of China's sports industry in 2019-2021. Finally, it is concluded that the use of time series prediction algorithm and SVM regression algorithm under the radio communication network spectrum prediction technology to forecast the development potential of China's sports industry has an accuracy rate of 90%, to compare and to predict the development potential of the sports industry in China. That is based on the selection of training and test examples. The effectiveness of data preprocessing in the arithmetic can increase the accuracy of the entire data model and the accuracy of the prediction results. Therefore, the output value of the algorithm, that is, the prediction index, is more accurate [20]. Therefore, it can fully explain that the use of radio communication spectrum prediction technology in China's sports industry to make predictions is scientific and accurate. The scientific and accurate prediction results of China's sports development potential obtained by the radio communication technology spectrum prediction algorithm have great reference significance for the long-term improvement of the sports industry in China. Data processing and prediction algorithm calculations on the actual growth value of the sports industry can draw real-time and accurate predictions of the industry development trend and then grasp the development situation of the sports industry in time. Therefore, the industrial development strategy can be adjusted in time according to the actual development of the sports industry to ensure and promote the long-term development of the sports industry. In general, the entire experiment went smoothly, and every basic step was implemented. Although with the help of time series forecasting algorithm and SVM regression algorithm, the whole experimental process did not encounter too many problems, but in terms of data processing, it seemed a bit difficult [21]. The reason is that the entire data processing process and the algorithm calculation process are slightly complicated, and our data processing

capabilities and experimental capabilities are limited, so we will encounter problems in data processing. For this weak link, we will conduct more data processing, training, and testing in future research and experiments to continuously learn lessons and improve the problem.

#### 4. Conclusions

As an emerging sunrise industry, the sports industry is a product of the continuous development of the national economy, the continuous improvement of people's living standards, and the continuous progress of the entire society. Its healthy and rapid development has significant influence in stimulating China's sports consumption, expanding domestic demand, and promoting the development of related industries, thereby promoting the rapid growth of society and the national economy. Although China's sports industry has a short start, it still lags far behind the developed countries in the world. However, since its establishment, China's sports industry has improved quickly, and it has already possessed broad market prospects and development potential. However, even so, no industry will develop smoothly without any problems. Although China's sports industry is developing relatively rapidly, it will definitely encounter difficulties in its development process. How to avoid or solve the problems encountered in the improvement of China's sports industry as much as possible is a significant precautionary strategy to promote the stable and healthy development of China's sports industry. Nowadays, the social economy is developing rapidly, and the development of various industries is also unpredictable. In this context, a timely grasp of the industrial development situation is particularly important for promoting the long-term stable and better growth of the industry. The radio communication spectrum prediction technology has played a certain role in predicting the development potential of China's sports industry by virtue of its time series prediction algorithm and SVM regression algorithm. Based on the overall structural features of the sports industry and the status quo of the industry's development, this paper combines the time series prediction algorithm and SVM regression algorithm under the radio spectrum prediction technology to forecast and analyze the development potential of China's sports industry. The conclusion reached is that the prediction accuracy rate of the increase potential of China's sports industry based on radio spectrum prediction technology is 90%. This conclusion fully shows that the radio frequency spectrum prediction technology is relatively effective for predicting the growth potential of the sports industry, and the prediction accuracy rate is relatively high. It is believed that the prediction method of the sports development potential based on radio spectrum prediction technology will definitely help China's sports industry to achieve better and more stable development.

#### Data Availability

Data sharing is not applicable to this article as no data sets were generated or analyzed during the current study.

#### Conflicts of Interest

The authors declare that they have no conflicts of interest.

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