

Research Article

Risk Management of Investment Projects Based on Artificial Neural Network

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The benefit evaluation of investment projects is the key to the whole investment activities. This paper mainly describes the risk management of investment projects using an artificial neural network. It generally adopts the index system of project risk through modern scientific measurement methods, to evaluate whether the investment project of artificial neural network is feasible or not. It establishes a benefit evaluation model based on an artificial neural network, from the analysis and consideration of 4 groups of experiments, comparing four sets of data: BP network convergence rate, artificial neural network identification efficiency, enterprise risk, artificial neural network output, and error; it is concluded that the relative risk is reduced by about 20% after using the artificial neural network. This also verifies the feasibility of artificial neural networks in the application of raw materials.

1. Introduction

The artificial neural network has better learning ability and can also perform some complex programs at the same time. This contribution to our computing is large, so increasing scholars are interested in investing in this related project. Artificial neural networks are used in various fields. In this regard, there are many researches on investment projects of artificial neural networks, and the risks of these projects also have research directions.

A human neural network is an essential research subject for modern science and technology. It is also a major direction for the subsequent scientific and technological progress of mankind. It plays an indispensable role in human life, medical care, and related work and has a certain guiding role in investment projects in this area.

This paper makes a comparison between the common traditional network convergence rate and the generalized

network convergence rate combined with an artificial neural network. The artificial neural network is covered by the traditional BP network convergence rate. It not only retains its original characteristics but also adds the characteristics of artificial neural networks. This problem can be idealized between enterprises, such as corporate finance, asset management, power risk management, corporate environment, production technology, and other issues, and it can also balance enterprise income and expenditure.

2. Related Work

Alanis presents an extension to the basic usage results of the recurrent neural network training algorithm of the Kalman filter and presents a predictive application for electrical energy. And it describes the one-step ahead prediction and n -step idea on European power system data and whether the proposed method is practical and applicable [1].

Isik and Inalli obtained data from the Meteorological Directorate General (MGM) and modeled it with an artificial neural network and an adaptive network-based fuzzy inference system. MATLAB software is used in thermal systems for modeling and prediction of forward-looking data with high sensitivity. It can also be used to verify whether the results of the proposed method are satisfactory [2].

Hodo et al. introduce threat analysis for the Internet of Things and use artificial neural networks (ANNs) to counter these threats. Then evaluate its ability to prevent distributed denial of service (DDoS/DoS) attacks. The ANN program was validated on a simulated IoT network. The experimental results show that the accuracy rate is 99.4%, which can successfully detect various DDoS/DoS attacks [3].

Ascione et al. combine EnergyPlus and MATLAB. Genetic algorithms allow the selection of recommended retrofit package optimization procedures by minimizing energy consumption and thermal discomfort. The algorithm uses an artificial neural network to predict the building performance and conducts large-scale uncertainty and sensitivity analysis to support the generation of the network. The latter has been tested against data provided by the current literature with very good results [4].

Hussain et al. discuss the use of machine learning methods for error prediction and parameter optimization. A combination of a genetic algorithm and an artificial neural network hybrid model is used to optimize the parameter set to minimize the shape error [5].

Tarawneh developed an artificial neural network (ANN) model to predict 60 values of CPT data. The model inputs are static probe tip resistance, effective vertical stress, and static probe casing friction. Artificial neural networks are good tools for predicting 60 values from CPT data with acceptable accuracy [6].

Ivanov et al. conducted an experimental comparison of various functional neural networks for visas and built a signature database for implementing computational experiments. It has been demonstrated that, to a certain extent, an increase in the dimension of decision rules reduces the probability of signature verification errors, while an increase in the number of neurons in the network reduces the number of errors [7].

3. Investment Project Risk Management Method

3.1. Current Situation of Artificial Neural Networks at Home and Abroad. In the 1980s, due to the rapid recovery of artificial neural network technology in the world, a research upsurge has gradually emerged in China. In October 1989, the World Symposium on Neural Network Theory and Application was held at Peking University, and in November 1989, the first academic conference was also started. On February 8, 1990, the University Association organized a grand meeting together. In subsequent conferences held at Peking University, many scholars contributed hundreds of related articles. This action opens a new chapter in the scientific research of artificial neural networks and other technologies in China. With the accumulation and accumulation of time,

in the related theoretical research, the martial arts field has gradually achieved relatively pertinent results. A key focus of the modern machine learning field is the neural network. Its concept was first proposed in the 1950s. After the 1990s, it was slowly unveiled by humans. And with the passage of time, people gradually become proficient in its application, mostly in medicine. However, artificial neural networks also have their advantages and disadvantages. Its advantage is that it does not require people to keep looking at the details of what is inside and does not have to pay full attention. This reduces the burden on researchers to a certain extent. Artificial neural networks are simple and can be retrained all time to deal with differently classified data. It can also be perfectly used to deal with its learning problems. The following are its disadvantage: it needs to obtain a large amount of data, and it is difficult to obtain these data. The details of the artificial neural network are mainly the weights after the activation function, and its meaning is still very useful. However, with the current concept of human beings, there is no way to understand it, nor how to explain it. The artificial neural network also needs to be trained repeatedly, in case of coincidence, usually reducing the dimension of the content as much as possible. The artificial neural network is shown in Figure 1.

The following is the structure of the artificial neural network as shown in Figure 1.

Among them, $1, 2, 3, \dots, N$ is the input value of the neural network. $A_1, A_2, A_3, \dots, A_n$ is the way weight from the input node to the internal node. σ is the activation point. The activation point of each function is the function diagram on the right in Figure 1.

It can also be called a sigmoid function, and the meaning expression can be expressed as follows:

$$F(a) = \frac{1}{1 + \exp(-a)}. \quad (1)$$

3.2. The Basic Mechanism and Principle of Artificial Neural Network. This is where neurons must be introduced. As a concept in biology, it is also the most basic structural unit. Neurons are mainly composed of dendritic cell bodies and axons. Each synergy performs a transmission process on the information. Among them, dendrites are used as a kind of signal processing. The collected information is processed by the collection and then by the cell body. The axon here is to transmit the information processed by the cell body to the next neuron and carry out the transmission processing of the information. Therefore, after being inspired by the principle of neurons, scientists have proposed a basic structural pattern in artificial neural networks. In the model, both of them also play the role of an information transmission process, which is similar in purpose. In this multidimensional input model, neurons are responsible for docking activation functions. After processing the docking, the resulting information is passed to the next neuron [8]. After getting information from the outside world, it becomes a basic neuron. After the activation function is processed, its information can be

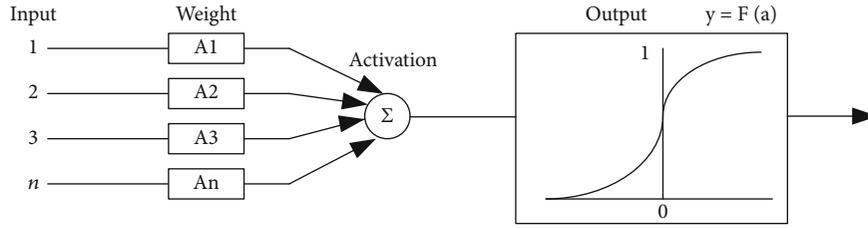


FIGURE 1: Artificial neural networks.

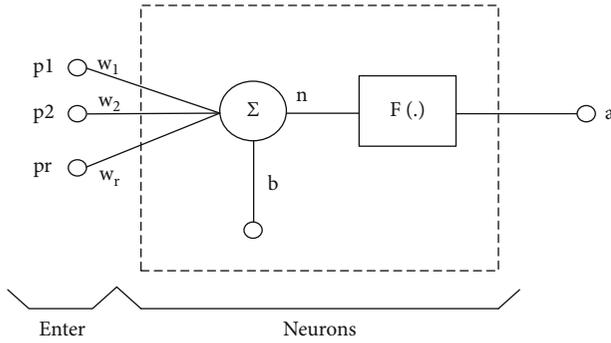


FIGURE 2: Single neuron model.

transmitted. To better process information and reduce the loss of information, there will be a “wrench to prevent deviation” when information is transmitted, which is also defined as a threshold. This reduces information errors, the threshold acts as a switch in the artificial neural network, and the activation function is a key to turn on the neural network in the neural network. The input value and the threshold make a judgment, and if the judgment is within the threshold range, it can pass the threshold; before entering, the activation step becomes part of the activation function.

The r neurons under the input node 1, 2, 3 \dots are shown in Figure 2. 1, 2, \dots , n are the weights. b is the threshold. Enter a product of the vector i - p and the weight i plus the total value of the bias b to get a new information input. This gives the following formula:

$$A = (w * p + b) = f(w_i * p_i + b). \quad (2)$$

b is used as an integral part of the activation function. The selection of the b value will play a decisive role in the performance of the network. Its center of gravity is the activation function. It plays an essential and decisive role in the quality of the network. And its value selection is also essential. There are three types of activation functions that are generally used.

- (i) Threshold activation function: threshold activation function is a special kind of function. Its application is to convert the input information between 0 and 1. Among them, the function $f(\cdot)$ is a step function.

The mathematical expression of the threshold activation function is

$$A = f(w * p + b) = \begin{cases} 1, & w * p + b < 0, \\ 0, & w * p + b \geq 0. \end{cases} \quad (3)$$

- (ii) Linear activation function: the output of a linear activation function is the weighted input plus the bias. Then the formula can be obtained as

$$A = f(w * p + b) = w * p + b. \quad (4)$$

The linear activation function is shown in Figure 3.

- (iii) S-shaped activation function: the role of the sigmoid activation function is to directly convert the values before information processing between 0 and 1. The image of a sigmoid activation function resembles an “S.” It is generally used in logarithmic functions, and its logarithmic activation function formula is

$$f = \frac{1}{1 + \exp(-n)}. \quad (5)$$

The formula for the hyperbolic tangent activation function is

$$f = \frac{1 - \exp(-2n)}{1 + \exp(-2n)}. \quad (6)$$

The hyperbolic tangent activation function is shown in Figure 4.

The advantage of the sigmoid activation function is that it can amplify the nonlinearity and can have gain. It can also convert the information obtained from the outside into a curve, which is represented by the slope of the line segment. Scientists and scholars can make the most of this feature. Its gain area is mainly reflected in the docking of some small signals, the gain of large signals, and the processing of amplifying signals, so that both large and small signals can be well gain. The linearity or nonlinearity of a neural network is usually related to the activation function. The selection of

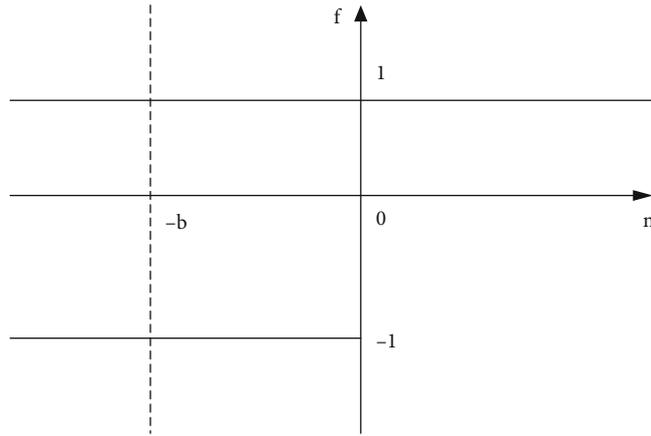


FIGURE 3: Linear activation function.

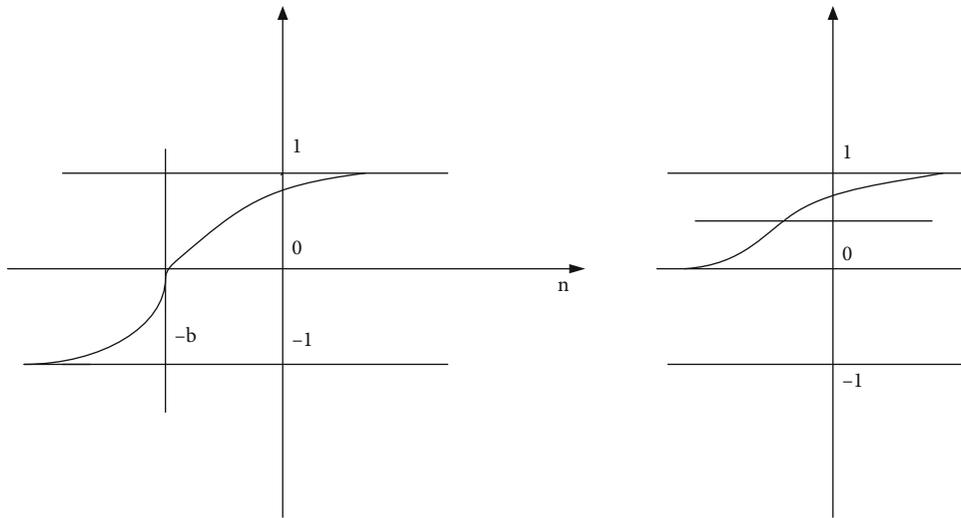


FIGURE 4: Hyperbolic tangent activation function.

the structure of the artificial neural network is crucial to the subsequent output.

The above is mainly to give a brief introduction to artificial neural networks. It mainly talks about the transmission of some signals, the advantages, and disadvantages. It also explains the required activation function, as well as its basic unit information and the inspiration points for scholars. This is also a hot topic right now. For scholars, because this is the key to subsequent people’s progress, how to unlock this key is crucial. This algorithm of artificial neural network has gradually become the most representative algorithm, and it has also become a routine algorithm for researchers.

3.3. *The Main Application and Structure and Calculation of Artificial Neural Network.* Artificial neural networks are still widely used in contemporary applications. It is multilayered, and there are many types, such as BP, convolution, and recursion. It is also called a multilayer feedforward neural network because of the variety of docking, as shown in

Figure 5. The nonlinear matching generalization of artificial neural network can be used in seismic survey, traditional circuit matching, local area network, dynamic image matching, etc. It has practical applications in nonlinear matching generalization, and it has back-propagation algorithm training, which can reduce the error between data.

In the form of the BP neural network model, it has another name called backpropagation algorithm. Its network structure is not single; it is a multilayer group. In its essence, it extends downwards and improves on it, and has a contrasting error in weight. It also has certain advantages in the application, and the specific performance can make the output data more detailed, thereby reducing errors. However, there are still some imperfections. When encountering some complex problems, its limitations are revealed, and sometimes, there is no way to get the desired answer for the optimal solution. Because of this situation, some scholars have combined traditional models to form their own unique set of methods, also called AdaBoost-BP model, as shown in

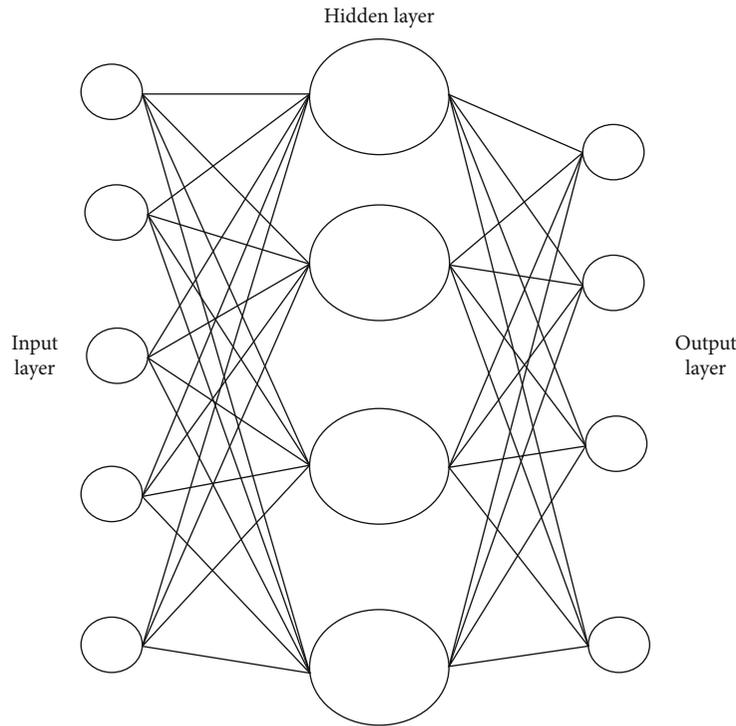


FIGURE 5: Structure diagram of artificial neural network.

Figure 6. The AdaBoost-BP model can be used to calculate its weight and error rate, and the calculated weight can be used as the next weight parameter, which can be used for iterative calculation using this method to calculate. In terms of short-term sales, the mean error has been reduced to 18.89%, which is much lower than the previous error value. The previous error value can reach 53%, which is already a big breakthrough. However, in some cases where the sample span is relatively large, there will still be large deviations, and only the sample data within 5 days can more intuitively see the expected sale changes.

On this flow chart, the general situation is that there is no best answer. In this case, scholars can only slowly adjust the expected value of the experiment by changing some data, to achieve the desired weight and threshold. After a series of data changes, the required weight and threshold can be achieved by changing the mean of the input value and the size of the threshold. Slowly on a set of changed data, the expected value of the peaks and valleys can be made [9]. Because of the problems encountered before, relevant scholars gradually use some better calculation methods. On the basis of the previous optimization, optimizing the activation function to make the error slowly can also improve the running speed and efficiency of the computer. In the simulation experiments, the generalized BP network can get the result faster than the traditional original BP network. For the corresponding problems, with a momentum of learning rates of 0.5 and 0.7, 6,000 iterations in the traditional mode and the iterations through 6 hidden units are only a quarter of the time required. Through experimental comparative observation, several possible configurations are considered.

When the two are used together in experiments, their performance values greatly meet people's expectations, and the convergence rate is almost 100% [10]. This is also a breakthrough in the experiment. There is a lot of room for improvement in terms of data, and the convergence rate is increased by about 20%, as shown in the comparison of Figures 7 and 8. This has been a lot of progress than expected [11]. Based on the dynamics of inertial impulses, the scientific community has discovered that it can be used to influence the rate of learning. In this regard, subsequent improvements can also greatly optimize its operation. The unexpected discovery is that it can also be used to affect the threshold, which is an unexpected and pleasant surprise. In this way, the useless iterations generated in the network learning process are removed, and the number of iterations is reduced, thereby improving the algorithm. These later are also used in the fuzzy diagnosis of steam condensing equipment [12]. It can also be optimized by the optimization algorithm. When working with the BP network, the project of the enterprise can also be estimated, and the identification of the efficiency of the enterprise is very high, as shown in Figures 9 and 10; the resolution accuracy is also better [13]. Some scientists combine back propagation algorithm with optimization algorithm and find that it can solve some enterprise problems well [14]. It can help enterprises make financial estimates, standardize employee information, and control and adjust the power of enterprises. There are also some power grid companies that combine BP and other algorithms to perform a predictive analysis on some financial aspects of the company. On the basis of the neural network, it can also be more in line with a company's income

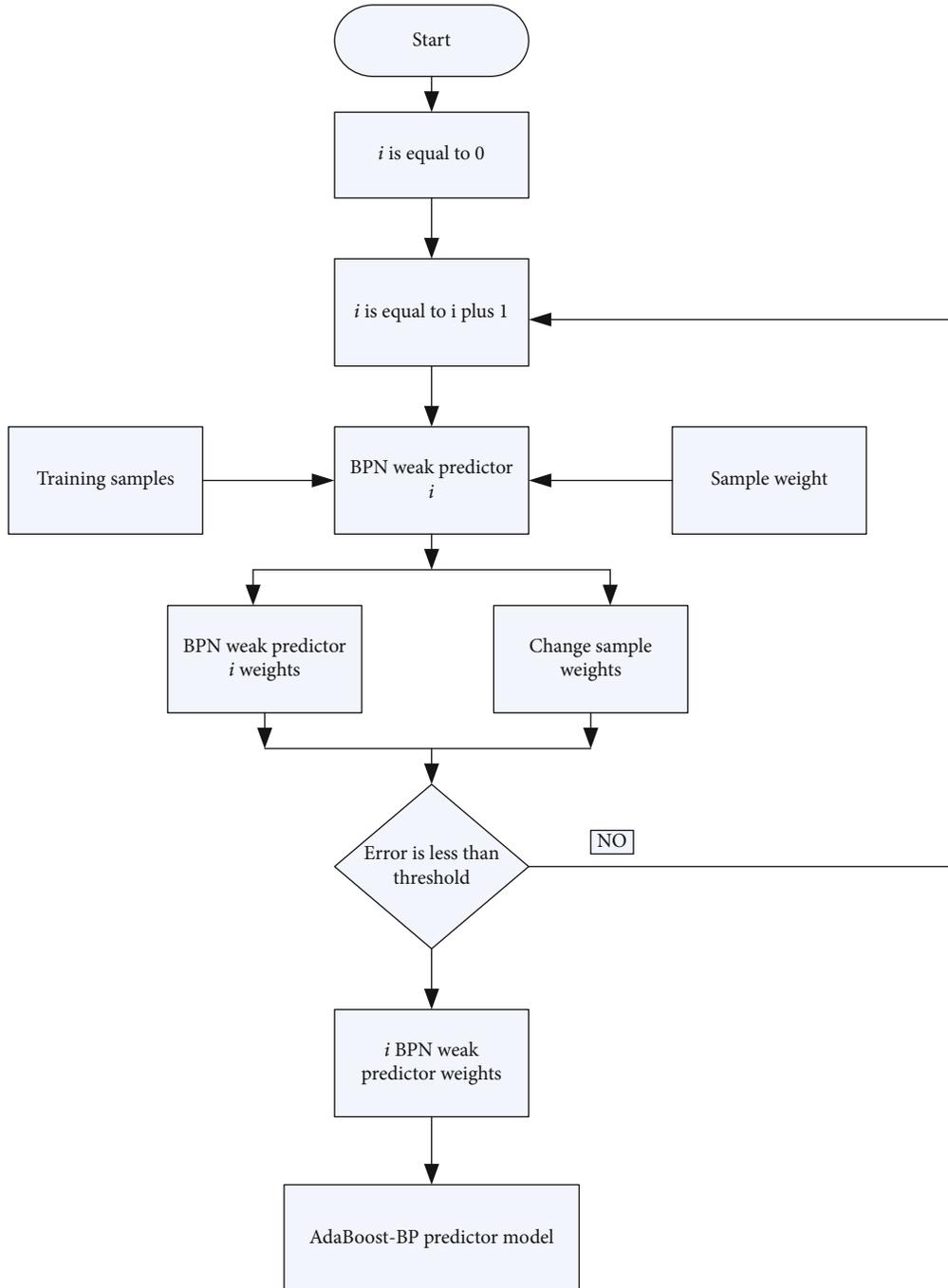


FIGURE 6: AdaBoost network model flow chart.

and expenses. It can predict the balance of income and expenditure and financial benefits within a certain range and can also deal with problems between enterprises more ideally.

3.3.1. The Role of Neural Network Learning Algorithms. It can be applied to natural language processing, image recognition, speech recognition, and other fields.

(1) Error Correction Learning. Let $x_k(z)$ be the real input value of the neuron at this moment when $y(z)$ and $c_k(z)$

be a deviation signal $f_k(z)$ of the control sample at the output; the general formula of the deviation signal can be obtained as

$$f_k(z) = c_k(z) - x_k(z). \quad (7)$$

The purpose of the error is mainly to make the obtained value $x_k(z)$ as close as possible to the expected one. In the case of guaranteeing a single variable, such an error value will be reduced as much as possible. This is also a problem of finding its optimal solution. Use Q to represent the error

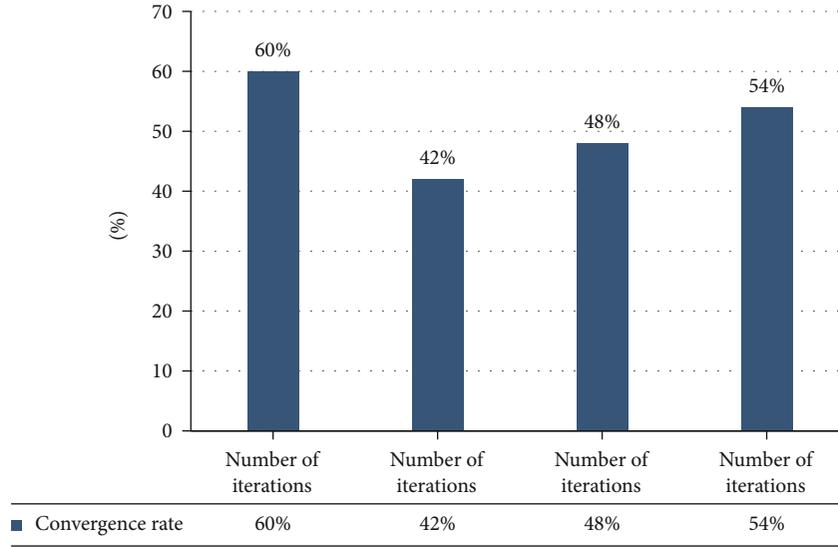


FIGURE 7: Convergence rate of traditional BP network.

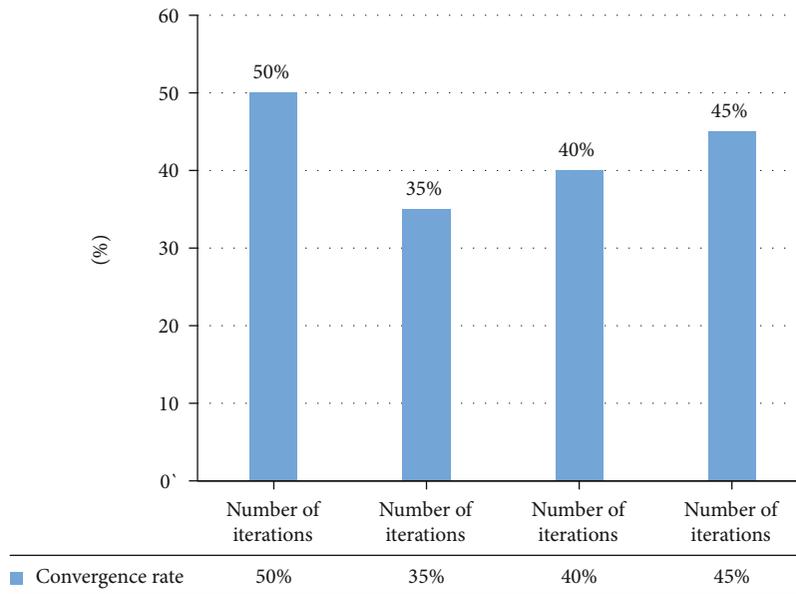


FIGURE 8: Generalized BP network convergence rate.

value of the optimal solution; then its formula can be as follows:

$$Q = \left(E \frac{1}{2} \sum_k f_k^2(n) \right). \quad (8)$$

Among them, E is an operation method to find the expected value. What it needs to have is a smooth, step-descent-like method. When expressed in error Q , some digital information must be connected. The overall method uses

Q together to represent the instantaneous value Q at time n ; then its formula can be obtained:

$$\varepsilon(n) = \frac{1}{2} \sum_k f_k^2(n). \quad (9)$$

Find $\varepsilon(n)$ with the minimum value of weight W ; according to the above method, we can get

$$\varepsilon(n) = \frac{1}{2} \sum_k f_k^2(n). \quad (10)$$

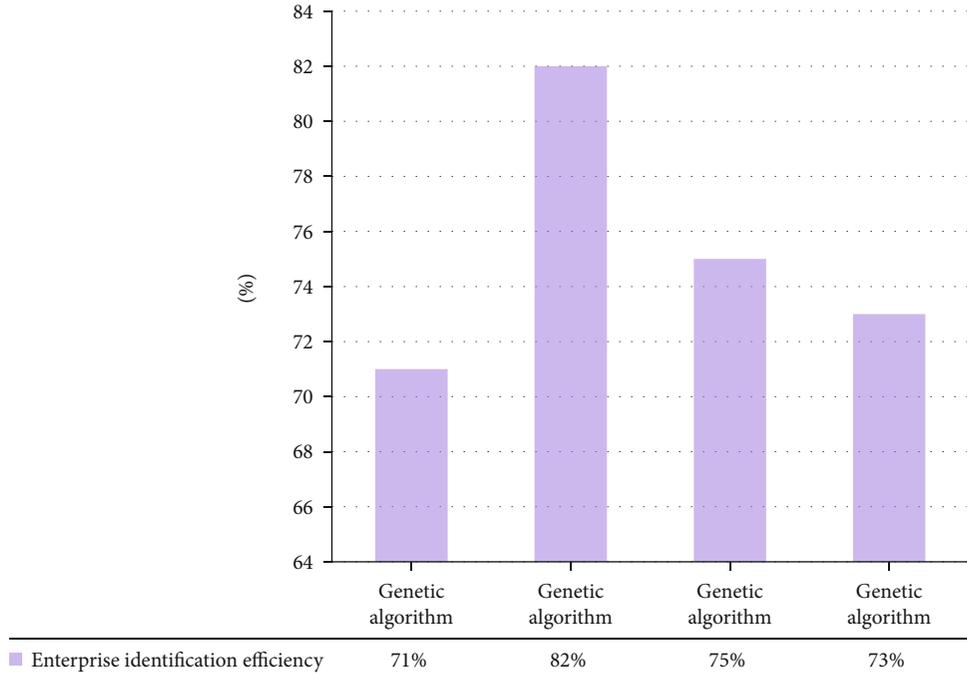


FIGURE 9: The identification efficiency of enterprises after the genetic algorithm is connected to the artificial neural network.

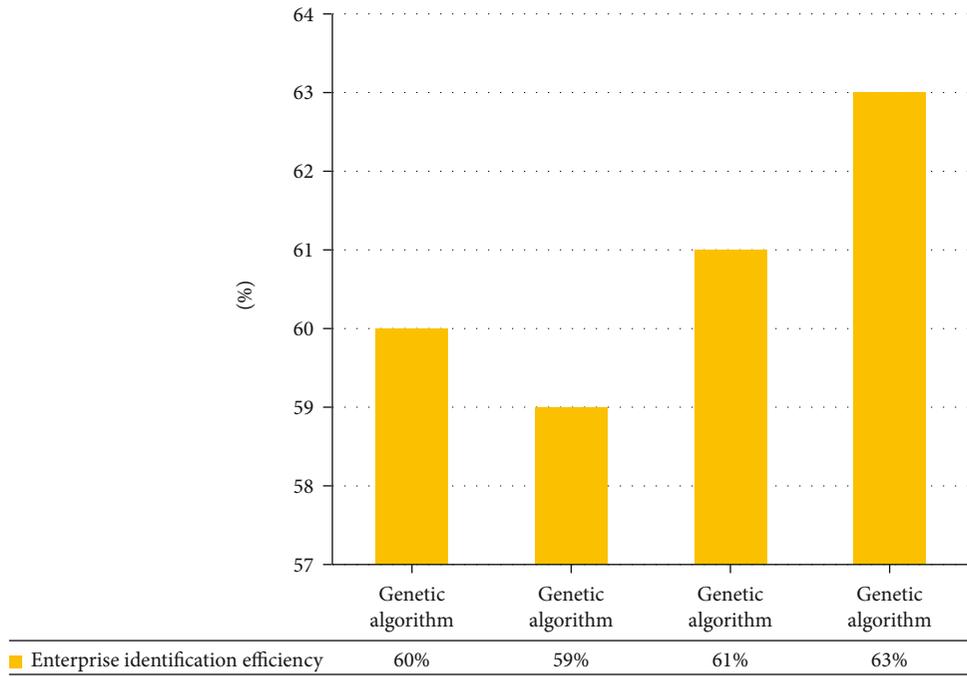


FIGURE 10: Identification efficiency of enterprises based on genetic algorithm.

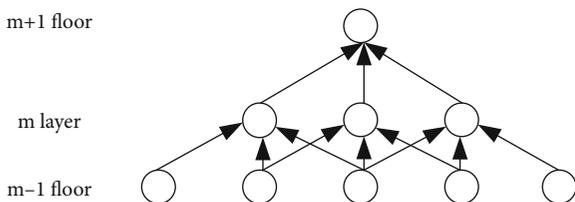


FIGURE 11: Schematic diagram of sparsely connection.

Among them, η is designed for learning step size, which can also be said to be a rule to find the best data through multiple error signals.

$$\nabla w_{kj}(n) = \eta f_k(n) x_j(n). \tag{11}$$

(2) *Learning*. Neuropsychologists judged according to this rule that “the activation and inhibition states will appear

at both ends of the neuron's activation." The response increases when activated and decreases when inhibited. Its formula can be

$$\nabla w_{kj}(n) = Ff_k(n)x_j(n). \quad (12)$$

Among them, $f_k(n)x_j(n)$ is the state of the neurons on both sides, and one of the most commonly used cases is

$$\nabla w_{kj}(n) = \eta x_k(n)x_j(n). \quad (13)$$

∇w , x_k , and x_j have a certain proportional relationship, which also becomes a relevant learning rule. Convolutional neural networks (CNN) can be regarded as a relatively common structural model in instrument learning. These are generally reflected in image classification and recognition, semantic segmentation, and translation, and the effect is still good. There are four traditional CNN structures: fully connected layer, output layer, convolutional layer, and pooling layer. CNN's achievements in images are still very good, and it is not much less in practical applications. Especially in identification, under its calculation, the instrument can more accurately identify the information of the picture and text and then record it. The resulting output vector is approximately equal to 0.434, the optimal interval for working together. Scholars combined the previous convolutional neural network CNN application with VGG16 and then applied it to face recognition and discarded the previously collected information and then combined the previous CNN to obtain a new model. Compared with the previous ICA algorithm, CNN has achieved significant improvement and image accuracy and recognition rate [15, 16]. Some scholars will apply CNN to fault-type problems, monitor the processed signals, and classify them autonomously. Through the intelligent diagnosis of the convolutional neural network CNN, the previous signal is processed to obtain a two-dimensional data image, thereby eliminating the influence of experience and the characteristics of the information. Experiments conducted in the experiments verify the effectiveness of the method, and based on the experiments, it can also be better used in the variation of workload [17]. Some other scholars apply this technique to the deformation module crack detector. In the last layer, it is transformed into a similar intelligent learning machine, which can achieve a pass rate of 97% in actual person recognition. And it will not conflict with other methods; on the contrary, there are some advantages. The sparse connection method of convolutional structure in the BP neural network is shown in Figure 11.

Suppose the bottom layer is the input layer. In the BP neural network, the neuron nodes in the middle layer are connected to all neuron nodes in the lowest layer. However, in the convolutional neural network, the connection method is different, but the neuron node in the middle layer is connected with its three similar nodes. This reduces the parameter size [18].

TABLE 1: Scoring criteria for individual indicators.

Risk	High risk	Higher risk	General risk	Lower risk	Low risk
Score value	<0.2	0.2-0.4	0.4-0.6	0.6-0.8	>0.8
Environmental risk	—	0.38	—	—	—
Technical risk	—	—	0.51	—	—
Production risk	—	—	0.48	—	—
Market risk	—	0.32	—	—	—
Financial risk	—	—	0.53	—	—
Management risk	—	0.36	—	—	—

(3) Applications of Artificial Neural Networks.

- (1) Face recognition: it is mainly based on information theory, operation and maintenance imitate the brain's thinking method and process information. Compared with the previous pass-through algorithm, although it has shortcomings in empirical characteristics, its characteristic is that it can process high-dimensional data [19].
- (2) Smart city: in the era of innovation and convenience, people are committed to the control and management of resource efficiency. This is mainly used to improve the quality of life of urban residents. In the process of real plan implementation, this can process a lot of data information [20], such as urban street lights, online monitoring, enterprise risk assessment, and medicine. The neural network mainly analyzes, filters, and disseminates data to realize graphics and video.
- (3) Risk assessment and forecasting: due to the limitations of traditional computing methods, the processing of data cannot reach the expected value of human beings, so it will be gradually applied in this estimation and other aspects. Because the previous information processing is incomplete, there are no rules, and the data is not obvious, then the future price and risk are processed in economics, and there must be a scientific basis [21]. The population can be modeled and analyzed according to the distribution and income of people, and a relatively stable and convergent scheme can be obtained.
- (4) Traditional medical data storage: because in terms of traditional medical data, the storage requirements are relatively high, but artificial neural networks can solve this problem very well. It can analyze and classify case models, which greatly facilitates medical workers, improves the ability to organize data, and more intuitively shows that biological signals can be effectively restored. This facilitates expert medical judgment.

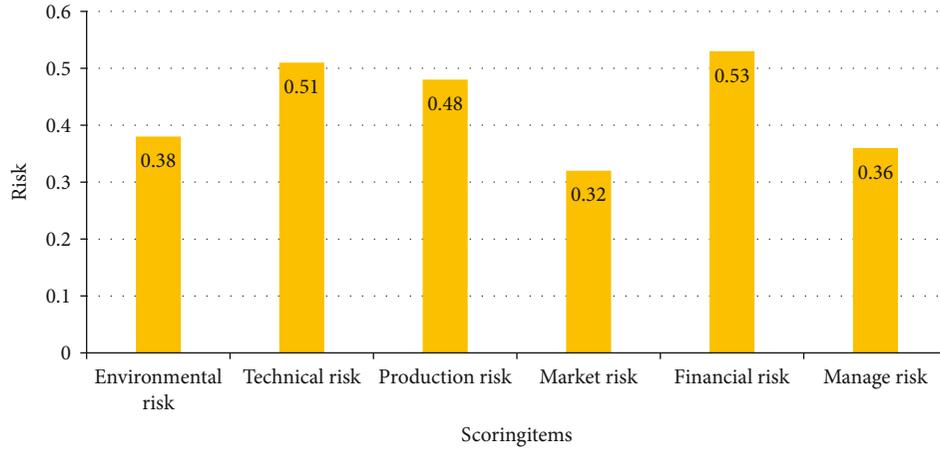


FIGURE 12: Various risk scores.

TABLE 2: Risk item score assessment.

Evaluation sample	Environmental risk	Technical risk	Production risk	Market risk	Financial risk	Manage risk	Evaluation value
1	0.82	0.61	0.86	0.83	0.75	0.82	0.8001
2	0.94	0.41	0.49	0.95	0.55	0.94	0.7100
3	0.88	0.47	0.50	0.88	0.62	0.65	0.5687

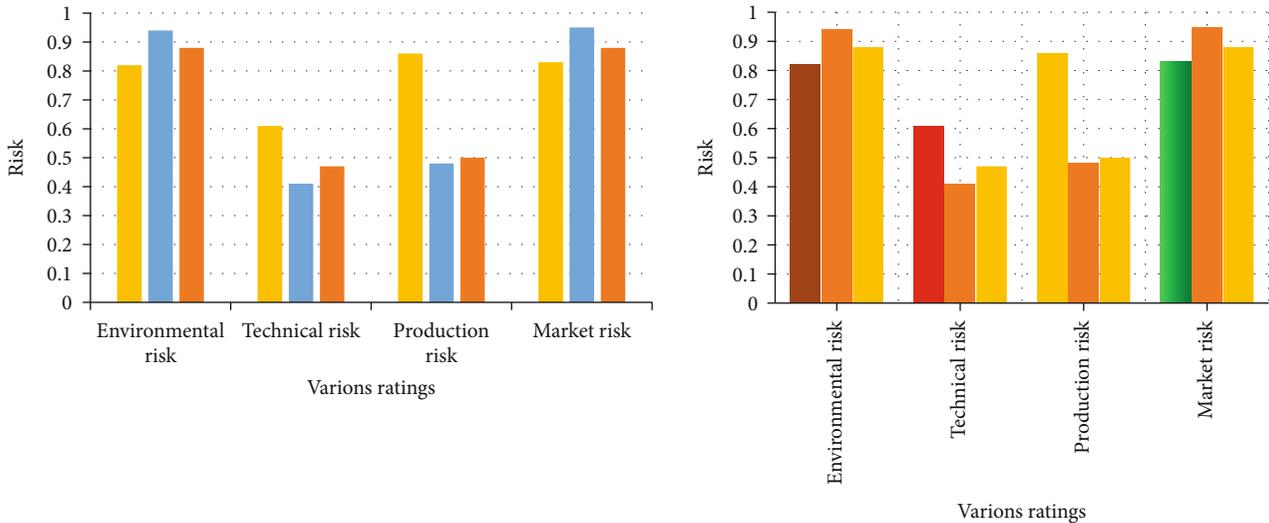


FIGURE 13: Enterprise risk comparison chart.

4. Experimental Analysis of Venture Capital Projects Based on Artificial Neural Network

The following is mainly to compare the risks between the enterprise market, finance, and management and investment risks and the output errors of artificial neural networks. It is a project evaluation model. It is mainly through a lot of intensive training and data sorting and analysis and then through the integration of the obtained data, to make a reasonable judgment on the project. In the absence of human subjective factors, the evaluation project is judged through

experience and technology to ensure its accuracy and numerical idealization of risks. An evaluation index in the evaluation is quite important. The information contained in it should be more and not repeated, and the selection of indicators needs to be accurate, and it can have a variety of selectivities. In this way, the risk assessment of the evaluation project will be more reasonable and the value will not be obtained blindly. Because the evaluation is a single project, the overall impact will be relatively large. What the enterprise needs is an overall assessment, so it needs to use a variety of methods to ensure the consequences of risk

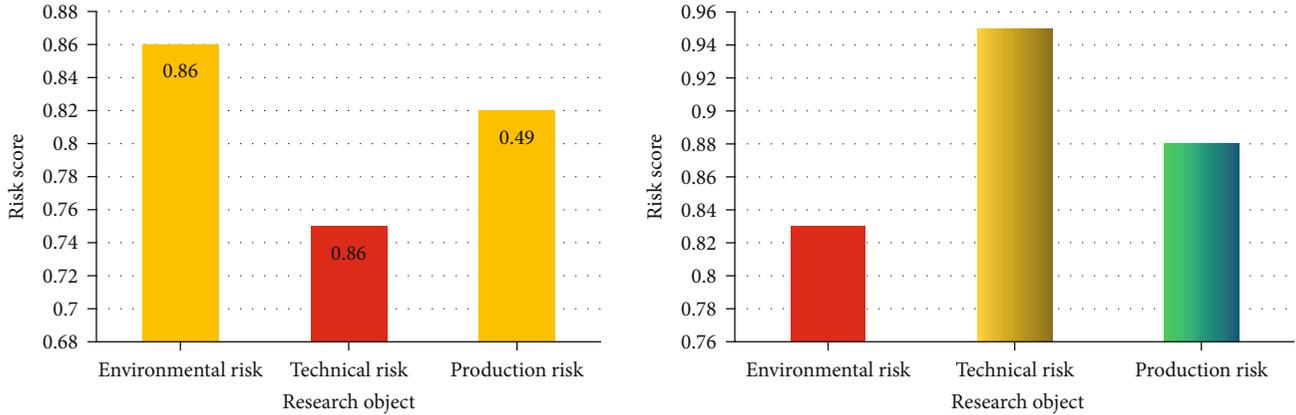


FIGURE 14: Investment risk comparison chart.

TABLE 3: Ship risk assessment model output values of neural network.

Ship	Actual value at risk	Conventional neural network		Improve neural networks	
		Output value	Error	Output value	Error
1	0.37	0.3669	-0.031	0.3722	0.022
2	0.43	0.4329	0.029	0.4281	-0.019
3	0.31	0.3122	0.022	0.3121	0.021
4	0.39	0.3846	-0.054	0.3864	-0.036
5	0.58	0.5861	0.061	0.5779	-0.021
6	0.44	0.4436	0.036	0.4417	-0.017
7	0.49	0.4858	-0.042	0.4926	0.026

events, as well as the acceptable worst results. Then there are different ways of dealing with the risks. Therefore on how to strengthen the rationality and scientificity of evaluation, this system and method becomes more important. Taking into account the actual situation of our country and for the convenience of research, six risk evaluation indicators are used to analyze the risk of the project. In actual use, it can be adjusted and increased or decreased appropriately according to the specific situation. This does not affect the application of this model. The six indicators are technology, production, market, environment, financial risk, and management risk. Each type of risk can also be classified in more detail. Such an evaluation is also unreasonable, and its influence on the weights is also varied and inaccurate. Each item should state its risk level assessment. Summarize the scoring results of each risk index, and obtain the average value. The resulting risk score value will also be more accurate. For the convenience of application, the score is controlled between 0 and 1. According to the evaluation level, the risk level can be divided into five levels: low, low, medium, high, and high. The scoring standard of a single index is shown in Table 1, and each risk score is shown in Figure 12, where less than 0.2 is high risk, between 0.2 and 0.4 is medium to high risk, 0.4 to 0.6 is medium risk, 0.6 to 0.8 is medium low risk, and greater than 0.8 is low risk.

The following 2 companies have overall risk assessment based on artificial neural network as shown in Table 2.

In the environment and technology, production risk comparison is shown in Figure 13.

The comparison of risks in market, finance, and management is shown in Figure 14.

There is also a set of model values for ship risk assessment, and a comparison of the two is shown in Table 3. The error is equal to the output value minus the input value. If it is a positive number, it means that the risk assessment of the ship is correct and there is a risk. If it is a negative number, it means that the risk of the ship can be ignored, which proves that there is no risk.

After the comparison, the comparison between the conventional artificial neural network and the improved artificial neural network can be found. In the evaluation of ship risk, it can be seen that the error after improvement will be lower, and this is also better for the safety of the ship. The risk of the ship will also be lower and more in line with the forecast results of the ship.

5. Discussion

5.1. *Codevelopment of Artificial Neural Networks and Simulation Algorithms in Other Fields.* Nowadays, many technologies are slowly being combined, which is also the trend of the times. An artificial neural network is no exception, and it is also a contemporary direction. There are many similar ones. Among them, there are chaotic neural network theory, quantum science, and quantum neural network generated by combination, and there are other simulations with contacts in related fields. It can help to have a better collaboration when contacting experimental neural networks, as well as better robustness to optimize its performance, and it is also slowly improving and optimized in related majors.

5.2. *Cooperative Development of Artificial Neural Networks and Edge Computing.* In the development of contemporary technology, artificial neural networks and edge computing also have a certain connection. After all, it is the focus of the Internet of Things. It will receive various information and need to process local data. The processing of these is

the edge server, which can be equipped with a network system and can better analyze the information processing and connect the output signal.

5.3. Development Status of Artificial Neural Network in Artificial Intelligence Core. The chip structure that simulates the network neural model of the human brain on the market is currently a new type of chip programming architecture. This architecture can more realistically simulate a perception, behavior, and thinking of the brain. However, this technology is relatively difficult and requires a lot of time investment. For example, some chip strategies include Qualcomm and Intel. However, most of them are the brain synapses of high-defense humans.

6. Conclusions

Artificial neural networks are currently a focus of research, and their significance is obvious to humans. It can greatly facilitate human life, and it is also a key for us to further develop and research new technologies. This article starts from the fundamental point and explores the origin, development, history, essence, structure, and use of artificial neural networks one by one. Although the current scientific research results cannot open this door, I have always believed that this door will eventually open in the near future, bringing us convenience and moving forward. It is a new world we have not explored yet that humanity has been waiting for.

Data Availability

The data underlying the results presented in the study are available within the manuscript.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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