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The application of artificial intelligence in computer network technology in the era of big data

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Abstract: **At this stage,with the continuous development of science and technology, artificial intelligence has been applied in many fields, this also includes computer network technology, which strengthens the work efficiency of the entire computer system and better meets the needs of individuals and the times.Based on the previous work experience, this paper summarizes the application advantages of artificial intelligence, and from the establishment of intelligent firewall, application in data information management, artificial immunity and data fusion, generation of intelligent intrusion detection,establishing rule production expert system in the era of big data , system maintenance in the six areas of application, it discusses the specific application of artificial intelligence in computer network technology in the era of big data.**

Keywords: big data; artificial intelligence; computer network technology

I. Introduction

Artificial intelligence is one of the most popular research technologies，Many companies have invested a lot in research in this area,this also makes the technology develop extremely fast and brings high economic value.In the application of computer technology, through the cross application with communication technology, it gradually shows the characteristics of intelligence.In the context of big data, the amount of data and information is growing rapidly,people can use artificial intelligence technology to improve the data processing efficiency of computer technology, especially in some complex data processing, the effect is more obvious.

II. Overview of big data and artificial intelligence

A. Big data

As shown in Figure 1,The main function of big data is to integrate all kinds of data and information in the network, and to apply the relevant processing technology to ensure the processing operation of the information that cannot be effectively processed in the database.Generally speaking, this kind of data information mainly includes the following characteristics:First, diversity.With the development of network technology, the amount of information is more and more large,and data sources are different, and the diversified characteristics are very obvious, such as information form, information content, and so on.Second, the larger scale.Due to the continuous improvement of modern computer network technology, the basic capacity of information is enhanced, which can provide a reference for the follow-up development of some enterprises in the laws and regulations[1] .

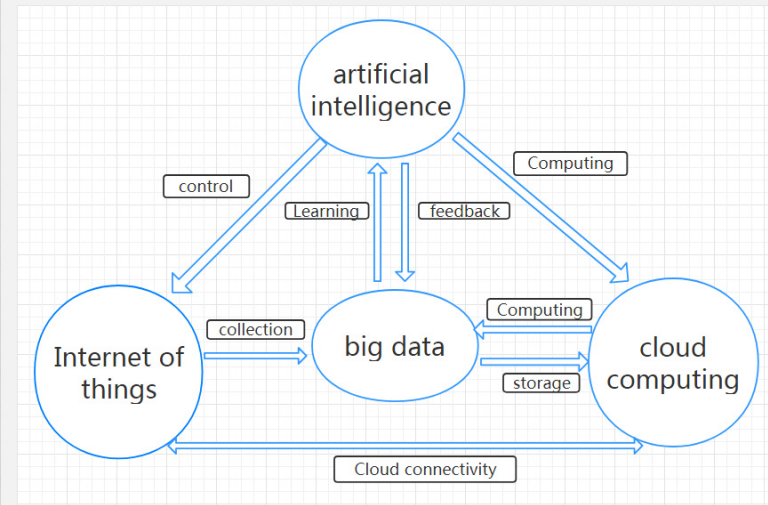

Figure 1 The relationship between big data and other technologies

B. Artificial intelligence

Artificial intelligence is the product of the development of modern science and technology. The specific development is shown in Figure 1.This technology can realize the simulation of human thinking through the application of special functions

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of computer.Current stage,Artificial intelligence has played its role in many fields,Such as medicine, machinery industry and so on,This technology not only can provide convenience for people's daily life, but also can complete the work with high technical requirements.At this stage, the technology has become the basic basis of technology research and development around the world,it can ensure that the level of computer network technology is greatly improved because of the integration with computer network technology.The main technical types of artificial intelligence technology include the following aspects:

1) Computer image function

This function is very common in daily life, such as face recognition, voice recognition and so on, it can also be seen from here that the application of this function can further enhance the convenience of daily life.Secondly, the confidentiality of this function is very strong. When it comes to some important content applications, people can use face recognition technology to ensure that the information content is absolutely safe[2].

2) Network system

Compared with the computer image function, this function is not common in life, and mainly used in business and other fields, such as enterprise inventory management and so on.This application can not only improve the effect of enterprise inventory management, but also ensure the improvement of enterprise economic benefits, which has positive significance for the subsequent development of enterprises.

3) Intelligent recognition

The most common application area of this function is intelligent wearable devices. If it can be reasonably applied, it can make people's life richer.

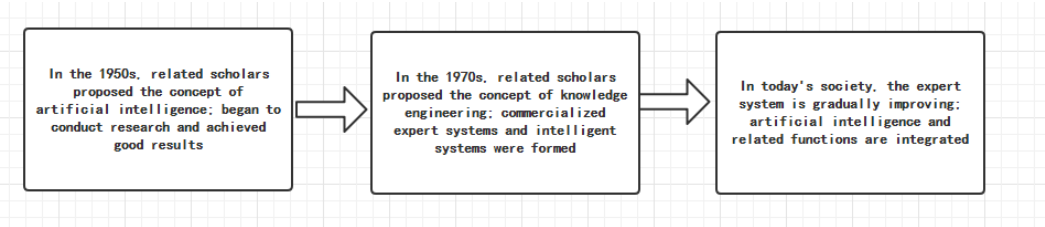

Figure 2 development stage of artificial intelligence

III. Application advantages of artificial intelligence

Under the influence of computer technology, the speed of updating various resources is gradually improving, which also makes the number of users more and more.In addition, artificial intelligence has a direct impact on network stability and security.So,network managers need to take effective measures to apply artificial intelligence to computer network technology to ensure real-time monitoring of the network. Qualitative and safety have a direct impact.The most obvious advantages of artificial intelligence are as follows:

A. Be able to deal with unknown problems

The thrust mode applied by artificial intelligence is fuzzy logic, which does not have high requirements for model construction, and can be described accurately without building a new model.In addition, the computer network contains a lot of vague information, and there are still many uncertain features in it, and it is difficult for the relevant staff to deal with these information.But after the application of artificial intelligence, the above problems can be solved easily.Artificial intelligence can rely on new application models to strengthen the computing and processing capabilities of network information,and establish multi-layer relationship in the network system, so as to ensure the improvement of computer network work efficiency[2].

B. Coordination capability

At this stage, computer network technology is in a stage of rapid development. With the increase in application requirements and scale, the work pressure of network administrators is also increasing.At this time, managers are vulnerable to work pressure, improper operation and other problems, affecting the normal operation of the computer system.In view of this kind of problem, people need to carry out relevant measures to transform the traditional management mode into hierarchical management to ensure all-round maintenance of network security.More importantly, this kind of management mode has a high requirement for the coordination ability between the upper and lower levels. If the ability does not meet the actual requirements, it will greatly affect the computer network management.But after the application of artificial intelligence, the problem can be fully resolved. Artificial intelligence can rely on its own collaborative distributed thinking to ensure the coordination of all aspects of network management, thereby strengthening the ability of network management coordination.

C. learning ability

Artificial intelligence can show strong learning ability by simulating human thinking. In the computer network, there are often a lot of diversified information with high internal value.In practical work, the relevant network managers need to excavate the value and maintain the development of the whole era.However, in dealing with nonlinear problems, human beings often show limited work efficiency, which is extremely unfavorable to the development of follow-up work.Therefore, the relevant staff can learn with the help of artificial intelligence. Through the use of its special functions, the nonlinear problems can be reasonably solved, and the overall work efficiency can be improved by more than 150%. This is also the basic process of information reasoning and analysis, and truly achieve the comprehensive mining of value information content.

IV. Application advantages of artificial intelligence in computer network technology in the era of big data

A. It can ensure the security of big data processing technology and application

From the development of the industry at this stage, we can see that computer network communication technology has been applied in many fields, showing obvious leading role.It is also under the influence of this technology, whether in industrial production or in daily life, more and more data need to be processed.Through the systematic mining, analysis and integration of data, 30% to 50% of the value data can be extracted from the existing data, which can guarantee great help to the development of the whole traditional industry and small and medium-sized enterprises.From the perspective of enterprise big data, data updates and changes are very fast, and generally cover many important data sources.In the past a long time, the way of collecting and processing data is relatively backward, which can not meet the processing standards of big data.Especially after the emergence of new data formats and sources, it brings great threat to the security of computer information network.Therefore, people need to apply big data processing technology to ensure that the whole process has security characteristics [3].

B. improving the function of artificial neural network

Artificial neural network is the most widely used technology content of artificial intelligence in computer network technology in the era of big data, which can imitate human brain thinking.Throughout the application of artificial neural network, it can carry out basic operation and processing of data. When using this kind of artificial neural network technology, it can reflect strong fault tolerance and be compatible with different data information.In addition, artificial neural network can also show strong learning ability, especially in the Internet environment, it can quickly adapt to and learn more knowledge, and carry out all-weather data supervision.At present, the main function of the application of artificial neural network in computer network is to maintain the network security.

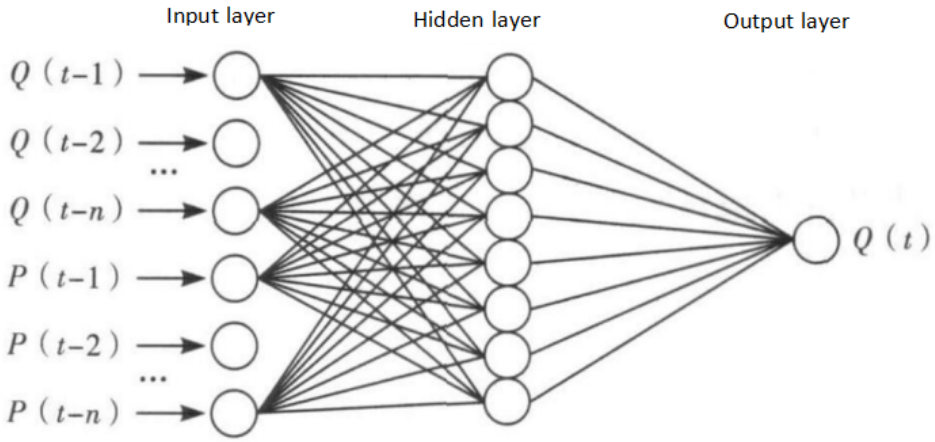

Fig. 3 Schematic diagram of artificial neural network

C. improve the management level of computer network information security

The application of artificial intelligence in network security management is reflected in firewall, intrusion detection system and so on. It can establish security protection network in computer network.In addition, artificial intelligence can also play a role in the anti spam system, scanning the content of e-mail that will enter the network to avoid the spread of spam in the network. With the help of artificial intelligence, firewall technology has been fully improved, but also shows a strong intelligent characteristics, to ensure that the level of network security management has been greatly improved, to avoid the whole system from being infringed by the virus.

V. The specific application of artificial intelligence in computer network technology in the era of big data

A. building an intelligent firewall

Firewall is an important barrier of network security defense. The application of artificial intelligence can better prevent various network risks, reflecting the characteristics of intelligence.As shown in Figure 4, through artificial intelligence, large-scale data analysis can be realized, offline information and fuzzy information can be processed at the same time, and the cyberspace security function can be completely improved.In practical work, if the firewall is attacked, people can detect unknown threats according to data mining and creation. Through the analysis and comparison of advanced data, we can get the specific situation of the threat program, find the source of malicious attacks in time, and comprehensively protect the cyberspace.In addition, with the help of intelligent firewall system construction, artificial

intelligence technology can also better carry out "learning the behavior of hosted applications".In this process, the network space can be reasonably released, and the check program for unknown threats can be improved to ensure the information security of computer users in the increasingly complex network environment [4].

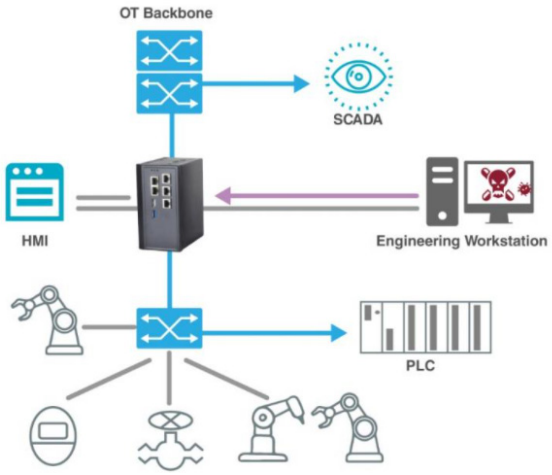

Figure 4 Schematic diagram of intelligent firewall

B. application in data information management

In actual application, the main task of artificial intelligence application is to perform information management operations. In the big data environment, people's requirements for information technology are gradually increasing. At this time, it is necessary to fully integrate big data and artificial intelligence. Artificial intelligence can realize the identification and analysis of data, carry out artificial intelligence management operations according to the state of data information, strengthen the efficiency of information processing, and the quality of data management, allowing staff to establish correct thinking in their work. Secondly, through the analysis of the problem data, the actual data can be fully diagnosed during processing. These can be solved through manual simulation and subject knowledge research, reducing the manpower input of related companies in this area, and optimizing management effectiveness. . For example, in the development of commercial artificial intelligence, there were a total of 329 financing incidents in the artificial intelligence industry in the first quarter of 2021, with a disclosed financing amount of 51.07 billion yuan; a total of 314 incidents occurred in the corporate service industry, and the disclosed financing amount far exceeded that of manual labor. In the smart industry, up to 82.04 billion yuan; 304 financing incidents occurred in the medical and health industry, and the disclosed financing amount was 63.853 billion yuan. In addition, there were also more than 100 financing incidents in the two major industries of automobile and finance. It can also be seen from this that the market development potential of artificial intelligence is huge, and the reason for this situation is directly related to its information management capabilities.

C. Artificial immunity and data fusion

In the application process of artificial immunity, it is mainly to imitate and analyze computer programs. The main design involves three aspects, namely gene bank, negative selection and clonal selection. Although the application effect is very good, there are some shortcomings, the most obvious of which is the inability to identify the virus [5]. For example, in the gene bank, some gene fragments can be collected and stored, but after the gene mutation, some specific conditions will appear. The system can take this opportunity to identify the virus. Due to the limited capacity of the gene bank, it needs to be strengthened. Through the network security data fusion operation, the system can apply multiple sensor information, which makes the system advantages more obvious. It can also modify similar restrictions through the increase of sensor interference to ensure that the application is integrated with other technologies. [6].

D. Generate intelligent intrusion detection

Intrusion detection is an indispensable part of the entire network security. If the computer only has passive protection measures, it is extremely vulnerable to network viruses, forcing the entire network security to be threatened. Applying artificial intelligence technology to the field of intrusion detection can better maintain the network security effect. When a malicious attack problem is discovered, the system will automatically send out an alarm message, and establish a new security protection system by intelligently detecting the generation of intrusion programs. For the development of the built-in intrusion detection function, the traditional passive defense system can be used to activate the intrusion program, establish a new interference and feedback system, and ensure the perfection of network security functions [7].

E. Establish a rule-based expert system in the era of big data

In the current stage of network security maintenance, the main approach is to achieve comprehensive optimization of the system with the help of traditional methods. In other words, the system is mainly based on the classification of professional experience to complete the identification operation and avoid the user from being affected by external factors when using it.

In actual work, the system administrator will summarize the external information and data attribute codes to form a summary, understand the internal information and application frequency, and clarify the specific purpose of the system [8]. In addition, in large-scale training operations, virus detection operations can be carried out with the help of a special protection system. The system itself has the ability to detect special system failures and can also display its functional characteristics. At this stage, the system has been initially applied in the community, and the effect has also been confirmed. At present, the most common professional development tools include Prolog, Gens artificial intelligence, etc., through the simulation of actual expert thinking, network information security and other issues can be fully solved, creating favorable conditions for subsequent historical data applications, which is also maintaining the network An essential foundation for safety [9].

F. Application in system maintenance

From the previous computer system management and maintenance, it can be seen that this kind of operation has a great impact on the security of computer network. When artificial intelligence technology is applied, it is often allowed to monitor and manage computer system. Once virus problems are found, it will be deleted in time to avoid the threat of hidden virus. First, it management basic content is described, special management authority is set to ensure that management efficiency can be strengthened. With the help of real-time it operation, the maintenance and management tasks of computer network later stage are performed [10]. If the virus is present, the relevant staff should immediately deal with it. Second, the computer network is maintained regularly, which involves the artificial computer operating system, computer anti-virus program and firewall, etc., which will eliminate the risk in time [11].

VI. Conclusion

In summary, artificial intelligence technology is one of the main directions of future technology development, and relevant enterprises and researchers need to pay more attention to the development of this technology. Through the combination of artificial intelligence and computer network technology, the computer can play a higher work efficiency, make up for the shortcomings of traditional computer technology, reduce the work pressure of staff, and provide better application experience for users.

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