Research of artificial intelligence in computer network technology

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Abstract. At present, China has gradually entered the era of computer network, which is widely used in daily life and production. The previous information operation mode and information database can no longer meet the needs of the current stage of work. Its birth not only improves the defects in the previous computing network technology, At the same time, with its efficient information collection, analysis and processing functions, people's living standards and work efficiency have been significantly improved. Based on the concept, characteristics and application advantages of artificial intelligence technology, this paper further analyzes the key points of application, hoping to provide powerful help for relevant enterprises or units at the present stage.

1. Introduction
As the front end of science and technology, artificial intelligence technology can realize the high efficiency and safety of data processing under the control of modern programming, which is conducive to the stability of computer system. Although it significantly reduces people's workload in the application process and creates many convenient conditions for various business operations, this kind of technology is at a high level of professionalism and complexity, coupled with a lack of application experience, so that it will encounter certain resistance in the application stage. Therefore, to expand its research depth and fundamentally ensure the security and scientific nature of information processing can make artificial intelligence step into a new stage in the era of big data.

2. Overview and characteristics of artificial intelligence

2.1. Overview
Artificial intelligence is a comprehensive and systematic advanced technology that relies on big data algorithms and includes the contents of many disciplines. Artificial intelligence is based on this, intelligent imitation of human beings, continuous learning, to some extent, with similar to human thought, behavior and ability. Compared with computer system, artificial intelligence has a higher level of intelligence, but the realization of artificial intelligence must be built on the basis of computer system. The development and application of technology also need massive data resources to do support, no matter what kind of artificial intelligence system, lack of huge data information resources, it is inevitable to be unable to carry out various intelligent simulation.
2.2. feature
Artificial intelligence is a new technology to realize development. The characteristics of artificial intelligence are as follows: (1) it has the characteristics of processing ambiguous information. By using the network fuzzy analysis method, the limitation of the traditional program is actively broken, so as to simulate the intelligent activities of human beings, to deal with part of the unclear information, and to track and analyze partial or all resources, and then provide effective information to users. (2) Intelligent management characteristics of the network. Through the application of artificial intelligence, promote the overall improvement of network information processing effect, and then use the memory function to improve the information, so as to complete the preservation of information. (3) Strong working ability. Artificial intelligence database is relatively large, using the advantages of computer network technology can improve the work effect, has a strong learning ability, can optimize the integration of resources, to ensure the comprehensive improvement of information application effect.

3. Problems existing in the application
Most of the problems exposed in the application of computer network are network security problems, which roughly include the low security of computer network system, the lack of security awareness of users and hacker intrusion and virus intrusion and other problems.

3.1. Openness and sharing make computer network system intrusion possibility increase
With the opening of the Internet, users can communicate and even transfer files to each other through the Internet. However, the openness of the Internet also leads to the possibility of intrusion of its computer network system greatly increased. This is because in the open computer network environment, the Internet will be a large number of various computer users connected in everything, making it can share data files. However, this also increases the possibility that the user computer is attacked by some malicious software, such as virus. In addition, TCP/IP protocol used in open computer network also has some security risks. For example, if the computer network is attacked by fraudulent data, the data in the whole computer network system may be damaged or lost, thus bringing certain losses to the users in the computer network. The most important is that in the open computer network, many users and units of information are in a semi-public state, some lawbreakers can get users and some units of private information from the open computer network through improper means, so as to cause certain damage to it. At the same time, the sharing of computer network may also be the user's computer to suffer from certain security risks. This is because in the shared computer network, the system cannot be completely isolated from the external isolation, which will lead to users will likely suffer from external services to bring attacks, resulting in certain economic property losses.

3.2. The management system is imperfect
Perfect network security management system plays an important role in the construction of security environment. Since the birth of the Internet, China's initial network technology is not mature, so the construction of network security management system has been in an incomplete state. Under this background, some illegal network elements make use of the Security loophole of the Internet to steal information, which seriously threatens the user's network security and seriously restricts the development of China's computer network technology. Secondly, based on the convenience of computer network technology, at the beginning of its formation, its main purpose is to create a more convenient and fast Internet environment, so it is constantly approaching this field. Therefore, the initial computer field lacks a perfect network security management system, leaving a lot of security risks to the network technology design. Taking modern network application as an example, if the security protection of this technology is not paid attention to, some relatively abnormal network failures will occur in the later period.
4. Specific advantages of artificial intelligence application in computer networks

4.1. Efficient processing ability
The efficiency of network is the key factor for the normal operation of computer network, but it is very difficult to process fuzzy information because of its uncertainty. In the process of using computer network, users only use their brain to orderly extract complex and disorderly information data. Artificial intelligence can use fuzzy control method to extract effective data from massive data, so as to improve the efficiency of data processing and reduce the time of data retrieval. This means using AI to process things faster and more efficiently. This greatly reduces the pressure of network workers, and effectively improves the operation efficiency of the network.

4.2. Optimize hierarchical management
At present, the use of computer network technology has become daily, and the management of computer network use has put forward higher requirements. But the use of the network itself has a high complexity, management work needs a strong technical system as a support. In the face of such a complex computer network system, the traditional hierarchical management has been unable to give full play to its effectiveness, mainly because hierarchical management does not have good communication skills. The emergence of artificial intelligence makes up for this weakness well. In the face of such a complex computer system, it can also achieve scientific and efficient management and deal with the security problems of computer network well.

4.3. Improve learning ability and non-linear processing ability
Artificial intelligence can mimic human thinking, so it has a strong ability to learn. There are a lot of diversified information in computer network, and each information has rich intrinsic value. The use of Internet technology can implement automatic collection of information, and through the imitation of human operation mode of network data information analysis and processing, so as to provide better customer information for business users. AI's strong learning ability has created a good atmosphere in cyberspace.

Artificial intelligence has the ability to deal with nonlinearity. The main function of artificial intelligence technology is to make machines imitate human intelligence. Human beings have a strong ability in dealing with nonlinear problems, and artificial intelligence is naturally not weak in this respect.

5. Application

5.1. Application of computer network security management
Artificial intelligence plays an important role in computer network security management, mainly in the following aspects: one is intelligent firewall technology; Intrusion monitoring technology; Third, anti-spam technology. Artificial intelligence technology in computing network security management has a very wide range of applications, the use of data statistics, artificial intelligence decision-making, probability calculation and other ways to carry out the corresponding detection and screening of data, so that we can further ensure that a large number of computing information matching check, effectively promote network behavior identification ability. The application of artificial intelligence in network security maintenance mainly includes pre-verification, in-process operation and maintenance, and post-facto analysis, as shown in Figure 1.
5.2. Computer network integrated management and system evaluation
Artificial intelligence is not only fully used in computer network security management, but also widely used in computer network comprehensive management and system evaluation. Computer network has the characteristics of dynamic and transient, which adds resistance to the integrated management of network. Artificial intelligence technology can be used to achieve comprehensive management of the network, such as problem solving technology, expert knowledge base and so on. Under the guidance of artificial intelligence theory, some expert-level decision-making and support methods are produced, which are very helpful to information system management. Artificial intelligence can accumulate rich expert knowledge and experience, form system resources into computer programs, convenient for comprehensive evaluation of the system later.

5.3. Application in processing computer network data
Nowadays, all aspects of data in computer network show a linear trend of growth, which puts forward more difficult challenges for data information processing. All kinds of advantages of artificial intelligence technology are fully combined in the computer network, so that the application effect of computer network technology and data of all aspects of information can be significantly improved. See Figure 2.
5.4. Application of computer network agent management

Artificial intelligence agent management is computer service system based on artificial intelligence software, it mainly work in agent based knowledge base, data information analysis and processing, in particular, to quickly complete all tasks, and in the user after using the information, on the layered management and record the data processing, transfer to a specific location, to provide users with better service. In terms of information search, artificial intelligence agent management technology provides custom Settings to make searching data and information more humanized. In daily practical use, these intelligent and humanized characteristics of artificial intelligence agent management system are of great significance to improve the user's work efficiency and save time. In addition, algebraic technology also has strong similarity. Firstly, cosine similarity is expressed as follows:

$$\sin(i, j) = \cos(i, j) = \frac{i \cdot j}{||i|| \cdot ||j||}$$

In the formula, i and j respectively represent different users. In terms of related similarity expression, the specific formula is as follows:

$$\sin(i, j) = \sum_{c \in C} (R_{i,c} - \bar{R}_i)(R_{j,c} - \bar{R}_j)$$

In the formula, R represents the user's score, i, c and j represent the user, and finally the modified cosine similarity. Since the user's scoring system is not taken into account in the above consideration, the application of the modified cosine similarity is very important, as shown in the following formula:

$$\sin(i, j) = \sum (R_{i,c} - \bar{R})^2 \sqrt{\sum (R_{i,c} - \bar{R})^2}$$

In addition, in terms of the calculation of average scoring deviation, the specific calculation formula is as follows:

$$\text{dep}_{q,p} = \sum \frac{r_q - r_p}{\text{card}(S_{q,p}(x))}$$

6. The development prospect of artificial intelligence in computer field

6.1. Artificial neural network

Artificial intelligence is developed on the basis of computer network technology and can realize intelligent thinking and processing. Generally speaking, artificial intelligence consists of multiple
modules, and each module can realize corresponding functions, such as learning, thinking and processing, which together constitute the overall function of artificial intelligence. Artificial intelligence technology can be used in the design of simulation system and the use of control system, and can be effectively applied in the process of robot design. The realization of artificial intelligence needs the support of a variety of technologies, including computer psychology, induction, etc. In addition, it needs the close cooperation of various disciplines to truly achieve the desired effect of artificial intelligence control.

In order to promote the development of artificial intelligence technology, it is necessary for relevant staff to fully consider the relevant computer knowledge, information knowledge, biological knowledge, etc., on the basis of scientific design and exploration, to achieve the corresponding function of artificial intelligence technology. One of the current development directions of artificial intelligence technology is artificial neural network, which simulates the processing unit of human nervous system.

6.2. Intelligent robot
Intelligent robot is a relatively rapid development of technology at present, intelligent robot can do some thinking and independently complete corresponding actions, in many fields and industries have been effectively applied, such as medicine, weapons, aerospace, etc.. The application of artificial intelligence to intelligent robots can further improve the learning ability and imitation ability of the robot, and then improve its function, complete more complex actions and instructions, to achieve better application effects. It should be noted that the current artificial intelligence technology is not perfect enough, so there are certain deficiencies in the application of intelligent robots, which need further research and improvement.

7. Conclusion
To sum up, with the continuous development of information science and technology, all activities of people rely more and more on artificial intelligence. Both work and life have the penetration of ARTIFICIAL intelligence technology, and in the future development of society, artificial intelligence will become an essential part. It is expected that as AI technology continues to improve, its integration with other scientific fields will continue to expand, benefiting all industries.

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