Research on the Application of Artificial Intelligence in Computer Network Technology in Big Data Era

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Abstract: Firstly, this paper analyzes the concept and importance of artificial intelligence, and then makes an in-depth analysis of the application of artificial intelligence in computer network technology under the background of big data era, including the detailed discussion of intrusion prevention network technology, firewall technology and standardized coding system. Finally, it expounds the advantages of introducing computer network technology into artificial intelligence, and promotes the rapid development of artificial intelligence in today's era by integrating computer network technology.

Keywords: information age, big data, artificial intelligence, computer network technology, research exploration

1   Introduction

With the rapid development of information technology such as computer and network technology in today's society, this information technology has changed people's lifestyle and working style, etc. The application of artificial intelligence in computer network technology is also being introduced and applied by more and more industries. Artificial intelligence technology based on communication technology, network technology and computer technology has greatly improved its response speed and perception range in recent years with the rapid development of the information age. It mainly simulates people's thoughts and behaviors through network information technology, and then uses signals to stimulate machines to make them respond like people. The application of artificial intelligence in computer network technology is mainly reflected in intrusion prevention, network security and network management. Based on the above, in the era of big data, we should pay more attention to the application of artificial intelligence in computer network technology.

2　The Concept and Importance of Artificial Intelligence

2.1 The concept of artificial intelligence

The rapid development of computer technology has laid the foundation for the emergence of artificial intelligence and is the cornerstone of the development of artificial intelligence. Turing test, one of the most famous artificial intelligence experiments at home and abroad, separates the tester from the testee, and asks the testee random questions through some devices (such as keyboards). After many tests, if the machine makes each participant make more than 30% misjudgments on average, then the machine passes the test and is considered to have human intelligence. This experiment also lays the foundation for the development of artificial intelligence. Artificial intelligence is called AI for short. It is a kind of computer technology to extend and develop people's techniques and methods, so as to simulate and develop them. Its purpose is to study the essence of intelligence, to simulate people's behavior by using information technologies such as computer technology and network technology, and to make machines complete the activities that people can accomplish through language recognition, image processing and other technologies. The appearance of artificial intelligence has changed people's lifestyle. Different from computer network technology, artificial intelligence technology is more efficient and intelligent, so it is necessary to study the application of artificial intelligence in computer network technology [1].

2.2 The importance of artificial intelligence

The integration of massive data is called big data, which is also called "massive data". Authenticity, low value density, diversity, high speed and large quantity are the five characteristics of big data. Information processing under big data will not be affected by human conditions, so it can better ensure the security of data. In addition, big data technology can collect, sort and analyze all information data, and with the development of the times, the amount of information data it integrates is constantly increasing.[2] Artificial intelligence technology can identify and filter text information, language information, chart information, etc. When foreign information enters, artificial intelligence will use information filtering system to identify information, filter out aggressive information and pass normal information. This kind of technology is lacking in computer technology, because only applying computer technology can't simulate people's thinking, so it can't filter information. Therefore, compared with computer technology, the application of artificial intelligence can solve the security problems in computer technology. In addition, the subject field of artificial intelligence contains many information technologies, and more network information technologies can make the information efficiently and accurately identified and analyzed, which can improve the work efficiency. Moreover, artificial intelligence can integrate and distribute resource information, which will promote the further development of computer technology [6].

3 Application of Artificial Intelligence in Computer Network Technology Under the Background of Big Data Era

3.1 Anti-intrusion network technology

Computer technology has developed rapidly in recent years, which has brought more convenience to people. However, while providing convenience to people, there are also network security problems. For example, computer technology is becoming more and more popular in people's lives, which is reflected in mobile phones, computers, etc. Mobile phone information, pictures, mobile phone contacts, etc. may be illegally obtained and spread, and computers may be illegally invaded by hackers to read personal private information of computers. [9] According to the survey, the security problem of malicious programs infected by computer technology in China is increasing with the development of the times. For example, during 2018 -2020, hackers infected more than 300 computers with a Trojan malicious program, and read more than 1.2T of sensitive information from it, resulting in an economic loss of 1 billion yuan in China (see Figure 1). Establishing a firewall between the network and the computer is the core of the intrusion prevention technology. The firewall can filter and screen the passed information, so as to prevent some attack information from being executed on the computer, thus avoiding the security problems of the local computer. It can also prevent the access of various sites on the network, so as to prevent malicious information of unknown origin from attacking the local computer to illegally obtain information. In addition, it can close the temporarily inactive ports. Being able to find and kill viruses is also one of the important functions of the firewall, and it can provide users with killing reports and detection reports, thus solving computer security problems and improving computer network security. [5] For example, when an unknown site view accesses your computer, the firewall will intercept it; When someone wants to log in to the software with your account, the firewall will inform the user in time that someone has logged in illegally and remind you that the password is unsafe. Please change the password in time. Establishing a firewall between computer network technology and artificial intelligence makes the firewall more sensitive and efficient in work.

Figure 1 Number of websites tampered in China in 2020

3.2 Standardized coding system

The standardized coding system is to prevent illegal intrusion. Firstly, the information data is coded, then the coded information is entered into the database by technicians, and finally the coded information data is classified by computer technology. In this way, when foreign visitors try to access the computer, illegal intruders or hackers attack the computer, the standardized coding system will be activated to start working, and the standardized system will analyze and check the external information. If the test result is different from the coded information in the local computer database, these information will be shut out and cannot enter the local computer system, but if the test result is the same as the coded information in the local computer database, the computer system will be carried out, thus ensuring the safety of the local computer. With the rapid development of computer information technology, the types of computer viruses are also increasing. At present, new computer viruses have different codes, and the standardized coding system can screen and intercept information through different codes, which is why the standardized coding system is applied in artificial intelligence. However, the standardized coding system is also a double-edged sword, which has both advantages and disadvantages. The disadvantage is that if there are too few standardized codes stored in the database, some information and data that are harmless to the computer will not be able to enter the computer, so that the local computer will be limited in receiving harmless and effective data and information, and cannot share network resources.[4]

3.3 Intelligent firewall technology

Based on big data technology and artificial intelligence technology, it is the core work of intelligent firewall to analyze and process network information by using memory discrimination function and probability operation function. When the computer is not working, it is suggested that the intelligent firewall should be turned on, which can supervise all the entrances and exits of the local computer, prevent unauthorized communication and network criminals' communication, but allow the authorized communication of the local computer to pass through. In addition, the intelligent firewall also has the port scanning function, which can hide the ports on the local computer, thus preventing hackers from attacking, and can monitor whether the local computer has access to sites of unknown origin. Once these sites are found to be harmful to the computer, it will intercept them in time to prevent the computer from being attacked. [8] Building a good firewall between the internal network and the external network, and matching hardware and software equipment are the core operations that need to be completed before the intelligent firewall technology runs. The firewall contains a "screening network", which can screen and judge the network information. Once the detected content is harmless to computer security, the traffic will pass through the firewall. If the content is harmful and aggressive to the computer, the screening network will block the traffic from passing through the firewall (as shown in Figure 2). Intelligent firewall can prevent fraudulent information from entering the computer by filtering data information, such as fingerprint recognition technology, face recognition technology and pupil recognition technology that has not been popularized, which is the full embodiment of artificial intelligence technology combined with biometric technology in people's life. Through these technologies, user information can be locked and encrypted, user data information and privacy can be protected, and software security can be improved. The defense function is one of the most important core technologies of artificial intelligence technology. When an external virus tries to attack the computer, the artificial intelligence

technology under the computer network technology will start the defense counterattack mode, which can make an immediate response, check, filter and intercept the external virus, and then push it to the firewall to kill the virus, thus ensuring the security of the computer and software.
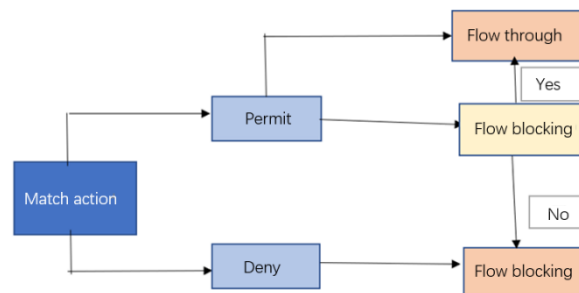

Figure 2 Working principle of firewall technology

3.4 Intelligent anti-spam technology

Intelligent anti-spam technology basically includes front-end authentication technology, intelligent filtering technology, basic filtering technology, etc. Anti-spam technology can better protect users' information privacy and improve security, especially the anti-spam technology integrated with artificial intelligence is more defensive. With the continuous development of network technology, there are more and more fraudulent forms and malicious programs in the society, which will affect users' computer security once they enter the computer. For example, in recent years, criminals package malicious programs in the form of emails or links and send them to users. Once users click on them, malicious programs contained in emails or links will be embedded in computers, and then these malicious programs will read computer user information and property information. In addition, computers will frequently receive junk information such as entertainment offers and online store offers, which will occupy more storage space of computers and affect the working speed of computers. However, with the emergence of intelligent anti-spam technology, these problems are gradually being solved, because once a computer mailbox receives an unknown letter, the anti-spam technology will screen and discriminate the email information, and if it contains malicious programs or spam messages, the anti-spam technology will directly delete the email, and promptly remind users that this email contains malicious programs and provide suggestions for users to hack such emails, so that users will no longer receive such emails containing malicious programs and spam advertisements, thus providing users with a safe network environment.[7]

4   Advantages of Artificial Intelligence Technology and Application of Agent Technology

The working system composed of database and knowledge repository is called agent technology of artificial intelligence. The role of database is to classify and store information according to categories. Knowledge repository is also called artificial intelligence database, as long as it is used to manage users' audio and video, documents, drawings and other information content. The

artificial agent technology is to identify the knowledge base and the data information managed in the database through its filtering function and decide whether it is allowed to enter the local computer. Finally, it compares the foreign information with the information stored in the database knowledge base through the function of identification and memory, and strictly controls the computer information entrance, so as to ensure the computer network security. Artificial intelligence agent technology allows users to set up their own functions. After users set up their functions, it will handle computer network security independently as users, thus saving unnecessary time for users. In addition, artificial intelligence technology has a learning function. If the data of knowledge base and database are continuously compared and screened, relevant knowledge will be continuously learned from it, and then the network environment will be judged and predicted in advance by using this knowledge to ensure the security of computer network environment. [3]Artificial intelligence technology under the computer network technology can improve the speed of big data processing information, because big data information is jumbled and huge, but artificial intelligence technology has security and stability, and the processing of big data information through artificial intelligence technology can be more efficient and high-quality; It is the advantage of artificial intelligence technology to have powerful data information exchange ability and computing ability. Through these technologies, information transmission can be realized dynamically, and artificial intelligence technology can simulate people's thinking, which can solve many problems in the network.

5   Conclusion

With the continuous development of network information technology, the application of artificial intelligence technology in computer network technology has become more and more extensive. Compared with computer network technology, artificial intelligence technology can have people's thinking logic, so it is more efficient in information collection and processing, and has higher security performance. Therefore, the application of artificial intelligence technology in computer network technology has great significance for the development of computer technology.

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