Research on Application of Artificial Intelligence Based on Big Data Background in Computer Network Technology

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Abstract: In recent years, science and technology have developed rapidly, information data has grown rapidly and society has entered the era of big data. Big data contains enormous economic, social, scientific values and has become the focus of attention of all walks of life. Many scholars have invested in the research of big data. Computer network technology has changed people's lifestyles, provided convenience for human life and developed toward the direction of artificial intelligence. Artificial intelligence technology improves the performance and effectiveness of computer network technology. This article takes artificial intelligence in the background of big data era as the research object, exploring its application in computer network technology, which provides some reference significance for the research and application of artificial intelligence in computer network technology.

1. Introduction
Big data contains a lot of information, including economic, social, scientific value and other aspects, through the analysis of big data, you can get the information you want. Many new ideas, new applications, new methods have been spawned by big data and research into big data has been going on throughout the world. In 2015, the State Council promulgated the Action Plan for the Big Data Exhibition, put forward requirements for research on big data and raised the research of big data to the national level and research on big data was pushed to a new climax in China. Artificial intelligence is a combination of network technology, computer technology and communication technology. It has amazing data processing capabilities and has unique advantages in the processing of big data. The use of artificial intelligence in computer networks can improve the ability of computer information processing, take corresponding treatment methods for different problems and ensure rapid information processing in case of information security. Therefore, in the context of big data, it is of great significance to study the application of artificial intelligence in computer network technology.

2. Big Data Concept and Key Technology Platform
The concept of big data is now well-known. Big data refers to massive data. It is difficult to analyze, process, manage data using traditional information technology within a limited time. In general, big data has the following characteristics:

1) Volume (volume): Big data contains large amounts of data. Judging whether a problem belongs to big data is also based on this judgment.
2) Generate Velocity: The data contained in big data changes very quickly and generates a large amount of data in a short time.
3) Multi-source heterogeneous: There are many sources of data and the modes are complex.
4) Value: The data contained in Big Data is disorganized and has a particularly low value density.

For any data research, the ultimate goal is to convert to value and big data research is no exception.
It is necessary to realize the conversion of big data to value, otherwise it will not make any sense. The key technologies for analyzing big data include three aspects:

1) Data platform. Through the data platform, data collection, management and storage are implemented to provide the data foundation for subsequent data processing. The data platform marks, sorts and cleans the collected raw data. In the era of big data, because of massive data, all data is stored, which consumes a lot of space and causes a waste of storage space. Therefore, “only knowledge but not raw data” should be stored, which can greatly improve storage efficiency.

2) Data Analysis Platform. Through data analysis platform, complete the analysis and calculation of massive data and convert big data into value. Due to the large amount of data, data analysis requires strong computing platform support, including hardware resources and software resources. Due to the large amount of data, computational computing should use high-throughput GPUs. Distributed computing frameworks include Parameter Server, MapReduce and other technologies. The data analysis method is the core of the data analysis platform. In general, big data analysis includes two methods: First, the use of artificial intelligence methods, such as neural network methods, this method has been continuously researched and improved, now that this method is the industry's most successful method of analyzing big data; Second, the use of manual analysis method, which relies on expert experience to perform manual modeling, builds different models for different business needs. The analysis is more difficult and the application has limitations.

3) Display platform. Through the presentation platform, the data analysis results are displayed and the knowledge promotion is completed. In general, the results obtained after processing big data have two forms of existence: direct value and indirect value. The direct value is the result obtained after analyzing and processing the data. For example, after analyzing the customer purchase data, the purchase habit of the customer is obtained. After obtaining the direct value, we can use the result and formulate the corresponding policy in the relevant aspects, so as to realize its social, economic and scientific value.

3. Artificial intelligence platform and its advantages in the network

Artificial Intelligence (AI), proposed by Mc Carthy at the Dartmouth Society in 1956, has been a research hotspot in recent years. It is an important branch of the computer science and is known as one of the world's top three technologies. Artificial intelligence is a comprehensive discipline. It is a synthesis of various disciplines such as computer science, physiology, psychology, linguistics, biology, and so on. It has highly complex and comprehensive technologies that enable the developed products to have artificial intelligence functions. In a complex work environment, artificial intelligence can also be called machine intelligence because it can replace a person to complete a specific job, improve work efficiency and protect personal safety. Artificial intelligence has self-learning capabilities that allow devices to perform specific tasks by simulating human activities. The relationship between artificial intelligence and many disciplines is very close. Especially the development of computer science plays a decisive role in artificial intelligence. The development of computer network technology depends on artificial intelligence technology. Therefore, artificial intelligence is in computer network technology. Development plays a very important role. Figure 1 shows the most common machine learning platforms currently in use. These learning platforms use their own programming paradigms and are based on AP, BSP and SSP parallel models.
This paper compares several typical machine learning platforms. The comparison includes the parallel computing model, the abstract data structure used and the fault tolerance mechanism, as shown in Table 1. From the comparison data, we can conclude that no platform is suitable for the design of the learning platform. No platform is the best. In practice, only the most suitable one is selected according to different requirements.

| Platform     | Data Structure | Parallel model | Fault Tolerance Mechanism | Extensibility | Communication efficiency | Stability | Applicable scene                              |
|--------------|----------------|----------------|----------------------------|---------------|--------------------------|-----------|-----------------------------------------------|
| Mahout       | ——             | BSP            | Checkpoint                 | low           | low                      | Higher    | Recommended System + Small-scale Machine Learning |
| Spark        | RDD            | BSP            | Checkpoint Lineage         | Higher        | Higher                   | High      | Large-scale data processing + small-scale machine learning |
| Graph Lab    | Graph Table    | AP             | Checkpoint                 | Higher        | High                     | Higher    | Large-scale graph calculation Large-scale machine learning |
| Petuum       | None           | SSP            | ——                         | High          | High                     | low       |                                                                 |

In the process of computer network intelligence, artificial intelligence has obvious advantages. This
advantage is mainly reflected in the fact that artificial intelligence has certain reasoning and learning abilities. The use of artificial intelligence in network management, to a large extent, can improve the accuracy and efficiency of data processing, and can also establish databases in the information storage process based on the advantages of artificial intelligence, improve network management and information processing capabilities.

4. Application of artificial intelligence in the network

With the advent of the data era, the issue of network security has attracted much attention. The question of whether data is secure on the Internet is a very important issue. The two most important functions in computer networks: network control and network monitoring. The security of data in the network depends to a large extent on these two functions. The normal functioning of these two functions depends on the acquisition of information and timely Correctly process the data. The data transmitted on the network basically has the characteristics of discontinuity and irregularity. However, early computers cannot judge the authenticity of the data, and can screen out effective information from a large amount of information, emphasizing intelligent technologies in computer networks. Through artificial intelligence, a complete management system and network defense system are built in the computer network to ensure the security of data in the network. In general, the application of artificial intelligence in computer network technology mainly includes network management, security management, and artificial intelligence.

4.1 Application of Artificial Intelligence in Network Security Management

In the era of big data, computer networks have a lot of data to process and traditional data processing technologies cannot meet the requirements. Therefore, artificial intelligence is used in computer network technology to meet data processing requirements. The application of artificial intelligence in the field of computer network security management includes only three aspects: intrusion detection technology, intelligent anti-spam system, and intelligent firewall technology.

(1) Intrusion detection technology. Intrusion detection technology is the core of computer network security management, it also constitutes one of the core firewall technology. The use of intrusion detection technology can improve the security and reliability of the network, improve the security of network data, make the resources in the computer network system have security, integrity, availability and confidentiality. At present, the intrusion detection technology is applied to computer network technology, which can analyze and process data according to categories and filter suspicious data. The detection report is fed back to the user in time. Therefore, the data security is guaranteed. With the use of intrusion detection technology, the operational status of the computer network can be monitored in real time, which can provide real-time protection for the computer network, improve the performance of the computer network, and enable the computer network to avoid external and internal attacks, so that the operation error can be avoided. Such as artificial neural network systems, expert systems, etc. have all started using intrusion detection technology and the effect is very good.

(2) Anti-spam technology. As the name implies, the intelligent anti-spam system is a technology that uses artificial intelligence technology to protect against spam. Anti-spam technology not only has no effect on the security of customer information, but also can effectively monitor and scan the customer's mail. Spam in the mailbox and provide the scan results to the customer, the customer can make corresponding treatment based on this information to ensure the security of the mailbox system.

(3) Firewall technology. Compared with other intelligent systems, intelligent firewalls adopt intelligent identification technologies, such as statistics, memory, probability, etc., to analyze and process the data, effectively reduce the complex calculations that computers need to perform in the matching process, and significantly improve the network attack behavior. The efficiency of effective interception of harmful information; Compared with traditional firewalls, the efficiency of smart firewalls is significantly improved and more effective prevention of virus intrusion ensures the security of data.
4.2 Artificial Intelligence in the Network
Applying artificial intelligence technology to computer network technology can ensure the security of data in the network. Therefore, we need to study how to apply artificial intelligence technology to computer networks. In general, artificial intelligence is used in computer network technology. There are mainly two methods that can be implemented. The two algorithms are: genetic algorithm and artificial neural network. The genetic algorithm is mainly combined with the evolutionary mechanism in genetics to realize artificial intelligence; artificial neural network is to realize intelligence by simulating the activity of nerve cells inside the brain. Both genetic algorithm and artificial neural network can realize the application of artificial intelligence in computer networks. Artificial intelligence is applied to related systems in computer networks, and is implemented in a programming format, which in turn enables related systems to have more targeted data analysis capabilities and computational capabilities and to improve computer data processing capabilities.

5 Conclusion
Through this paper, it can be concluded that in the context of big data, many things in the work need computer network support to complete and people's lives cannot be separated from the computer network. Therefore, for the problem that cannot be independently solved by the computer network technology, it needs to be solved through artificial intelligence technology. But so far, the application of artificial intelligence technology in computer networks has been still in the process of research. It requires more in-depth research, and relies on advanced technology, further researches on artificial intelligence, and contributes to the development of artificial intelligence.

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