



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

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## ABSTRACT

With the continuous development of social economy, science and technology are also in continuous progress, relying on the Internet technology of big data era has come in an all-round way. On the basis of the development of cloud computing and Internet technology, artificial intelligence technology has emerged as the times require. It also has more advantages. Applying it to computer network technology can effectively improve the data processing efficiency and quality of computer network technology, and improve the convenience for people's life and production. This paper studies and analyzes the practical application requirements of computer network, and discusses the application characteristics and timeliness of artificial intelligence technology.

## 1. Introduction

In recent years, the people's living standards have been continuously improved, and there are more requirements for Internet technology. Artificial intelligence technology has gradually entered the public's field of vision and is gradually applied to life, work, study and entertainment. The research and development of artificial intelligence by scientific researchers continues, and the application of artificial intelligence technology to computer network technology has become a current hot spot. The integration of the two can not only improve the processing capacity of computer information analysis machines, but also greatly improve its flexibility. The application of artificial intelligence to computer network technology has also become a future development trend.

## 2. Basic Overview of the Era of Big Data and Artificial Intelligence

### 2.1 The Era of Big Data

Today, when Internet technology is gradually mature, it has been applied to all walks of life, and the Internet has also played an important role. The types and quantities of information involved in production, life and learning are increasing, and the era of big data was born. Based on Internet technology and advanced cloud computing platform, it can quickly process information data, distributed file system and expandable storage system, etc., which require some advanced and effective technologies to process big data information assets. Big data has the characteristics of fast data flow, large data scale, multiple data types and low value density [1].

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## 2.2 Artificial Intelligence Technology

### 2.2.1 Definition of Artificial Intelligence

Artificial intelligence is a comprehensive modern technology, based on big data algorithms, it has the content of psychology, linguistics, behavior and computer science, and is the product of the current development of computer science.

Artificial intelligence takes the human thinking operation mode as the reference object and relies on computer technology to drive the operation of mechanical products, make rational judgments and decisions, and solve problems in a timely manner. This is an evolution and upgrade of automation technology. All in all, artificial intelligence technology is an anthropomorphic manifestation of computer network technology, which realizes human-like thinking and can serve in multi-industry logic analysis.

### 2.2.2 Application Characteristics of Artificial Intelligence Technology

First of all, artificial intelligence technology combines it with computer logic algorithms by imitating the human way of thinking, which can give priority to fuzzy information and reduce the amount of system fault tolerance. Secondly, artificial intelligence can solve problems that traditional algorithms cannot solve, and combine the results with human thinking and preferences to obtain answers that are highly compatible with humans, and meet the needs of intelligent applications in multiple fields. Finally, artificial intelligence technology has self-upgrading and learning functions, which can realize information data upgrade and computational research, and has extremely information processing efficiency [2].

### 2.2.3 Application Advantages of Artificial Intelligence Technology

It can be seen from the above that artificial intelligence technology has functions such as human-like thinking and autonomous learning. Under the development and construction of computer network, it has the following advantages in application.

First of all, artificial intelligence can help computers realize network data centralization and high-speed information processing, and has important application value in maintaining the stability and pertinence of network information [3].

Secondly, artificial intelligence technology can reduce the frequency of humans operating computers, and can completely replace humans in dealing with some special

problems, effectively achieving the goal of artificial collaboration and artificial substitution. With the expansion and extension of the computer network model, the model has undergone hierarchical changes. The multi-thinking ability of artificial intelligence can be applied among multiple management layers.

Finally, the efficient learning ability of artificial intelligence can realize computer network information simulation and result prediction. Artificial intelligence technology can learn and analyze in multiple information layers, obtain key information from a large number of databases, and infer and summarize the evolution of high-level information and data. This method is called the simulation realization of artificial intelligence, which can reduce data occupation, improve computer resource processing and control efficiency, and comprehensively improve the application quality of computer network technology.

In the background of big data era, with the development of computer technology, Internet technology and bionics technology, artificial intelligence technology has emerged. It is an advanced science and technology, which can simulate human behavior and thinking, and has certain ability of imitation, learning, adaptation and organization. The artificial intelligence technology is applied to the machine to realize the intelligence of the machine, thus providing convenience for people's life and production and improving people's happiness index. The application of artificial intelligence technology to computer network technology is an inevitable trend in the future. Transforming the manual operation and search function of computer operation into intelligent operation can not only improve the speed of information acquisition, but also effectively guarantee the information preparation. Moreover, the artificial intelligence technology has strong cooperation ability, and carries out information resources according to the needs of different users Source exchange, improve work efficiency.

## 3. Application Research of Artificial Intelligence in Computer Networks

### 3.1 The Application of Artificial Intelligence in Computer Network Security

In the context of the development of computer networks, people's awareness of network information security has also been improved. Today, while artificial intelligence technology provides people with convenience in life, it also brings a greater risk of network information application. In recent years, news about online fraud and online information theft has always been a hot spot of social con-

cern. The public is highly vigilant about network information security. In order to improve the quality of network monitoring and ensure network security to the greatest extent, it is recommended that relevant departments strengthen network monitoring and management, guarantee the security and scientificity of network information to the greatest extent, and finally realize comprehensive network monitoring and management. Computers can make quick calculations on data that does not have continuity and regularity, so as to derive data algorithms and find potential relationships. However, it is difficult to find the leakage point in the multi-channel information interaction environment only through information processing, and the investigation of abnormal data is difficult, the staff is lack of skills, and the processing accuracy is not high<sup>[4]</sup>.

Artificial intelligence technology can effectively reduce the difficulty of manually querying data and improve the quality of integrated management of network data. For example, an artificial intelligence-based information visit and tracking system can be established to achieve the purpose of automatic search and information reading. In the entire network operation, problematic data can be processed in time, and existing faults can be handled. In addition, artificial intelligence can also deal with the problem of network delay and ensure the operation of computer network information to the greatest extent. Finally, the use of artificial intelligence technology can also reinforce the security system, ensuring the security of user information to the greatest extent.

### **3.1.1 Application of Smart Firewall Technology**

Artificial intelligence has a variety of applications in the field of computer, among which intelligent firewall and intrusion detection technology are its important contents, and the importance of computer operation security is self-evident. Through the application of these two technologies, the information security in the process of computer network operation is effectively guaranteed<sup>[5]</sup>.

Among them, the intelligent firewall technology can effectively intercept some harmful information and emails in the computer network, and prevent the computer from being attacked by viruses and hackers, thereby improving the safety of computer operation. Compared with the traditional firewall technology, its intelligent analysis ability is much higher. Moreover, the intelligent firewall technology and intrusion detection technology can establish a perfect automatic defense function in the computer system, which can automatically prevent the intrusion of a virus-bearing webpage when the computer accidentally browses. It can be seen that the application of intelligent firewall and intrusion detection technology in computer

networks not only ensures its safe operation, but also promotes the development of computer networks to a certain extent.

### **3.1.2 Application of Mining Technology**

Since the birth of computer network technology, it has been faced with the test of security problems. This is because the computer network system is open, and there are more and more network viruses and hacker attacks. In order to ensure the security of the computer network, the artificial intelligence technology is applied to the computer system, and attention is paid to data mining and processing. The Internet technology and mining seem to be applied together, the illegal intrusion mode and related data are deeply mined, and the differences among them are compared, and a set of reasonable computer code is formed. The way and way of illegal intrusion are analyzed and confirmed, and the law of intrusion is mastered, so as to effectively improve the security of computer network. What needs to be noted is that because the network system itself has loopholes, we must continue to improve the network system, analyze the illegal intrusion situation reasonably, and timely replace the computer facilities when they are relatively old and backward. In case of illegal intrusion of computer system, through the combination of mining technology and Internet technology, the actual analysis of the invasion can be carried out, and timely processing can be carried out. Meanwhile, the detection of illegal intrusion situation should be continuously increased to establish a set of perfect intelligent prevention and control system, so as to improve the security of computer network<sup>[6]</sup>.

## **3.2 Application of Artificial Intelligence in Computer Network Management**

### **3.2.1 Expert System Database**

Expert system is an important part of artificial intelligence technology. This system has a rich expert database, which uses a lot of expert knowledge, experience and reasoning methods, and stores the known content into the expert database through the Internet technology, and then converts some simple contents into complex programs through artificial intelligence technology the experience of expert system constantly optimizes it, so as to select the most appropriate way to apply to the computer network system, effectively realizing the network management and evaluation work. Expert system database is the most widely used computer network system. It can be said that it is the perfect product of the combination of intelligent tech-

nology and computer technology. It not only makes up for the lack of capabilities of traditional databases in data processing and artificial intelligence in logical reasoning and data processing. It also improves work efficiency and storage space, making the expert system database an indispensable part of the computer network management system.

### 3.2.2 Artificial Intelligence Answers

These technologies are also widely used in computer network technology. They are mainly used to answer user questions. After the user gives some specific conditions, artificial intelligence answering technology automatically searches the Internet for the most matching answer. Compared with the previous question and answer method, the artificial intelligence answer only needs a relatively simple instruction to carry on the follow-up screening work, and carries on the analysis and processing to the self search content, thus finding the information the user needs, shortening the information search time and improving the work efficiency. For example, when users hear “just see you in the crowd”, they don’t remember the song name and singer. If they read these words in the input crowd through the artificial intelligence answer system, they will automatically jump out of the search tag that only sees you in the crowd, and then they can quickly find the song name and singer. On the basis of ensuring the accuracy of the search, the search efficiency is improved.

### 3.3 Application of Artificial Intelligence in Business Management

Under the economic construction, the application field of artificial intelligence is gradually expanding. It not only plays an obvious role in industrial production, but also has important application value in the construction and management of modern enterprises. First of all, artificial intelligence technology can realize the automatic monitoring and management of the enterprise, which can improve the progress tracking, employee inspection, and work follow-up of its leadership, and comprehensively improve the management efficiency of the enterprise. In addition, the intelligent management method provided by artificial intelligence not only promotes the high-efficiency construction of enterprises, but also achieves the goal of low-cost and high-yield, which is of great value to the comprehensive investment and construction of enterprises. Finally, artificial intelligence technology can realize self-learning through continuous accumulation, and can construct a complete and professional computer network system according to the current status of enterprise con-

struction and development, which can promote the construction of various tasks of the enterprise and comprehensively improve the work efficiency of the enterprise.

## 4 Precautions for the Application of Artificial Intelligence Technology under the Construction of Computer Networks

### 4.1 To Ensure the Safety of Information Network Operation

Computer network technology has penetrated into many industries in China. Under the influence of artificial intelligence technology, the problem of network security is becoming more and more serious. From the perspective of the development of network construction, network virus and computer network security management are always in a dynamic game state. With the upgrading of computer network security system, network virus is also updated. In the environment of survival of the fittest, the maintenance and long-term operation of artificial intelligence technology is bound to rely on network information security. How to maintain network information Security is also one of the hot topics that people pay attention to at present.

### 4.2 Network Operation and Maintenance Management

In recent years, China’s computer network technology has achieved rapid development. While meeting the needs of people’s life and office, the demand for information and data applications has increased exponentially. On the one hand, the dynamic of information processing is obvious. The introduction of artificial intelligence technology strengthens the management power of computer, and also endows it with more advanced data analysis ability, which plays an important role in promoting the control and improvement of network information security and operation and maintenance quality. How to rationally use artificial intelligence technology, comprehensively improve the automation management of network operation and maintenance, and define the authority of manual supervision and mechanized supervision and inspection are also important problems facing the development of computer network technology [7].

### 4.3 Screening and Interception of Computer Network Technology

Nowadays, computer network technology has built a number of information sharing and exchange platforms for

people, and the Internet has become an important channel for people to trade, exchange information and obtain resources. But in such an environment, people can not help suffering from the bombing of network information, such as advertising mail, promotion telephone and network violence, etc., and their personal privacy is leaked inadvertently. In the future, it is also an important direction for the development of computer network technology to use artificial intelligence to reasonably screen and clean up junk information, and to build a scientific and personalized information collection and interception system.

#### 4.4 Equipment Upgrade

With the rapid development of computer network technology, 5g era is coming quietly with the support of mobile communication technology. In the environment of emphasizing upgrading and reform, the corresponding hardware equipment of computer network technology also needs to be updated and iterated. At present, China's artificial intelligence technology relies on advanced computer network and electronic mechanization technology. Only by building an environment of "adequate nutrition" and "suitable growth", can artificial intelligence technology thrive in modern society.

#### 4.5 Construction of Network Evaluation System

In order to realize the intelligent development of network management system, the role of artificial intelligence is also essential. By solving the problems existing in artificial intelligence and expert knowledge base, a network integrated management system is established. The network is constantly changing and has a certain dynamic. Artificial intelligence network management technology can solve the problems in network management. In artificial intelligence technology, expert knowledge base is the summary of the knowledge and experience of experts in different fields, which is input into the system to realize the construction of knowledge base system and form intelligent computer program. If there are problems in a certain field, we can use the experience of experts to solve them, so as to better evaluate the computer network management.

### 5. Conclusion

In conclusion, artificial intelligence technology plays an important role in promoting computer application security and enterprise comprehensive management. At present,

the technology has been deeply applied to industry, agriculture, education, enterprise management, and penetrated into people's life, work and leisure. Artificial intelligence is a kind of symbol, which affirms the development of computer network technology. Artificial intelligence has extraordinary advantages in network security, information processing, network garbage screening and system upgrading. Artificial intelligence also has a good application prospect in computer network technology, which promotes the vigorous development of computer network technology.

In the background of big data era, the role of artificial intelligence is becoming more and more important. The application of artificial intelligence to computer network technology can not only ensure its operation safety, but also improve its network management efficiency. However, at present, the application of artificial intelligence technology in computer network is not mature, so relevant staff should increase the research on intelligent technology to provide greater convenience for the people.

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