

# Application of Artificial Intelligence in Computer Network Technology in the Context of Big Data

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**Abstract:** In the process of computer network technology development in the new era, in order to improve the security and reliability of computer network operation, it is necessary to conform to the development trend of big data technology, start flexibly from the following aspects, and give full play to the application value of artificial intelligence technology, such as intelligent cloud computing, intelligent routing algorithm, load balancing application, network topology optimization, network anomaly detection, intelligent data caching, intelligent network management, etc. This paper analyzes and discusses the application of artificial intelligence technology in computer network technology under the background of big data.

**Keywords:** Big Data Technology; Artificial Intelligence; Computer Network Technology; Practical Application

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## Introduction

In order to promote the continuous development of computer network technology, it should be in line with the background of big data, reasonably introduce artificial intelligence technology, give full play to the application role of relevant artificial intelligence technology, solve the relevant problems in the operation of computer networks, and improve people's computer office efficiency and security.

## 1. The necessity of the application of artificial intelligence technology in computer network technology

Under the background of the development of big data technology, computer network data continues to grow, and massive data information has been formed, which has brought certain adverse effects to the operation of computer systems. In order to effectively solve related problems and tap the potential value of massive data, artificial intelligence technology should be scientifically used to achieve in-depth analysis, efficient storage and security protection of massive data, and provide strong support for the work of computer users.

## 2. The application of artificial intelligence in computer network technology under the background of big data

### 2.1 Intelligent cloud computing

Under the background of the development of big data technology, cloud computing technology has become one of the important applications in the current computer network technology, in order to give full play to the application advantages of cloud computing technology, improve the storage and computing capacity of computer data information, can reasonably use artificial intelligence technology, such as deep learning technology, machine learning technology application, to build an intelligent cloud computing operation system.

For example, in computer data information processing, based on the support of machine learning technology and deep learning technology, the massive data in cloud computing can be analyzed and processed, so as to mine valuable data information and provide strong support for subsequent computer operations. Based on the application of intelligent cloud computing technology, it can safely and efficiently complete the scheduling of network data resources, effectively improve the effect speed of data analysis and processing, and ensure the smooth and efficient operation of computer systems<sup>[1]</sup>.

## **2.2 Intelligent routing algorithm**

In order to make the computer system intelligently complete the routing selection and ensure the stability of the computer system operation, based on the application of intelligent routing algorithm, the change law of network traffic and network topology can be analyzed, so that the reliability of network data transmission can be effectively improved.

Through the analysis of the traditional computer routing algorithm, it can be seen that the computer system relies too much on the relationship between the routing table and the network topology during route selection, and cannot ensure the efficiency and stability of network data transmission. With the support of modern intelligent routing algorithms, based on the application of artificial intelligence technology, it can analyze from massive network data and finally select the best routing network.

For example, computer users can intelligently predict network traffic based on the support of machine learning algorithms to select the optimal path from multiple routing paths. Based on this routing method, network congestion can be effectively avoided and provide strong support for the operation of subsequent computer systems.

## **2.3 Load balancing applications**

Through the analysis of load balancing technology, it can be seen that under the reasonable application of this technology, traffic can be evenly distributed and the response speed of computer servers can be comprehensively improved. In the analysis of the previous computer load balancing technical scheme, it can be seen that this technical solution mainly relies on server resources and load balancing algorithms, and cannot respond quickly to achieve reasonable allocation of computer operating resources.

With the support of machine learning algorithms, the application advantages of artificial intelligence technology can be fully exerted, such as learning and analyzing historical traffic data information, and then predicting the future traffic development trend of computer network operation to achieve load balancing regulation, and the support based on deep learning algorithms can effectively improve the accuracy of load balancing prediction, reflecting the application advantages and value of related artificial intelligence technologies [2].

## **2.4 Network topology optimization**

In the development of computer network technology in the new era, based on the support of artificial intelligence technology, the effective optimization of the network topology can be realized, a new network topology can be constructed, and the fault tolerance and transmission efficiency of the computer network can be qualitatively changed.

When designing the previous computer network topology, designers need to manually plan the network topology nodes and complete the effective connection of related nodes. If this design scheme is adopted, it will consume a lot of manpower and material resources, and it is impossible to guarantee whether the network topology reaches the optimal solution. In order to effectively solve this problem and ensure the effectiveness of the operation of the network topology, the automatic design and optimization of the network topology can be realized based on the rational application of artificial intelligence technology, so as to avoid errors in the manual design link and affect the feasibility of the network topology. After the network topology is effectively optimized, the efficiency of computer network operation can be qualitatively improved.

## **2.5 Network anomaly detection**

In the process of computer network operation, once there is virus invasion and software failure, the security of computer system operation cannot be guaranteed. To this end, when detecting abnormal operation of computer networks, artificial intelligence technology should be reasonably used to improve the reliability of network abnormal detection. Through real-time monitoring of data information generated by network processes, system logs, device events, etc., abnormal data such as external network virus intrusion, software failure, and illegal operation can be found. When detecting abnormal faults in modern computer networks, in order to effectively improve the quality of the work, artificial intelligence technology is mainly used to give full play to the application advantages and value of artificial intelligence technology.

For example, machine learning algorithms can be flexibly used to detect abnormal computer network faults. Based on

the rational application of this algorithm, it can realize the analysis and processing of massive data information, construct relevant data analysis models, extract abnormal data information from massive data, and identify it to provide a basis for subsequent computer network fault resolution.

In the actual application of artificial intelligence technology, it can not only analyze and diagnose the abnormal data information of the computer network, but also respond quickly to emergencies based on the support of the automated operation system, and play a related emergency plan, such as attacks on network viruses, illegal access by illegal users, etc., the automated operation system can warn of its risks, and take corresponding defensive measures to repair the technical scheme to ensure the safety and reliability of the overall operation of the computer network system.

## **2.6 Intelligent data caching**

In order to ensure the high-speed transmission of relevant data of the computer network system and complete the effective control of the network load, it is necessary to scientifically use intelligent caching technology and adaptive service management scheme. In the past computer network system operation process, a large number of network cache data stored in the local network, and the data access mode was not reasonably optimized, resulting in the continuous increase of the local network cache data information, which directly affected the efficient operation of the computer network.

In the process of intelligent data caching, based on the application of machine learning algorithms, the learning of user data access behavior can be realized, and the user's access behavior can be predicted based on the support of massive samples, so as to realize the intelligent cache of relevant data information and effectively improve the efficiency and security of data transmission.

## **2.7 Intelligent network management**

In the management of computer networks, it is necessary to make reasonable scheduling of network resources, such as bandwidth, computing power, storage, etc., and in the intelligent network management mode, scientific and reasonable scheduling of various network resources can be realized to ensure the safety and reliability of the overall operation of the computer network. For example, under the application of deep learning technology, the identification and classification calculation of traffic is realized, so as to summarize the relevant types and characteristics of network traffic, provide strong support for computer users to carry out related work, and reflect the application value and role of artificial intelligence technology.

## **3. Concluding remarks**

In summary, the author takes computer network technology as an example to focus on the specific application of artificial intelligence, aiming to illustrate the necessity of the integration and application of artificial intelligence technology and computer network technology under the background of big data development. The application support based on artificial intelligence technology can promote the upgrading and iteration of computer network technology, create a new computer network technology environment, and promote the continuous development of computer technology in China.

## **References**

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