## **Application of Artificial Intelligence in Computer Network Technology**

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Keywords: Artificial Intelligence, Computer Network Technology, Application

**Abstract:** with the deepening of science and technology, the original capabilities of computer network technology, such as data operation and word meaning interpretation, have been unable to meet the actual needs of modern users. It has become an inevitable choice for computer network technology to adapt to the development of the times to improve its humanization and intelligence level. Artificial intelligence enables computers to replace human beings to complete more complex work, which can save working time and improve working efficiency. At the same time, it can also promote people to enjoy more intelligent services, realize the innovation and development of science and technology, and promote the long-term sustainable development of society. Therefore, this paper expounds the application of artificial intelligence in computer network technology, and helps people to better understand this measure, providing necessary foundation for the further development of artificial intelligence in the future.

## **1. Introduction**

As a new science and technology, artificial intelligence is applied more and more widely in social life, and its influence on social life is becoming more and more intense. At this stage, as far as the popularization and application of computer network technology in life are concerned, it has greatly changed people's production and life style, and has also brought better service to people's study and life [1]. Computer technology needs to develop towards humanization and intelligence, continuously improve its operation and management efficiency, and improve the safety and reliability of information. Artificial intelligence technology has its own advantages. It not only greatly improves the work efficiency, but also replaces human resources and reduces the production cost of the industry. It frees people from trivial life, making life more efficient and giving people more time to enjoy life [2]. At present, the research and practice of artificial intelligence technology have been carried out in many new technical fields. Especially computer network technology. As a modern technology that affects people's work and life, artificial intelligence technology also plays an important role in computer network technology [3]. In the development of the actual industry, the use of artificial intelligence technology can not only further improve the actual work efficiency, but also promote the further application of computer network technology, thus promoting the better development of computer network.

## 2. Introduction of the Related Theories of Artificial Intelligence Technology

Artificial intelligence technology refers to the technology that simulates people's thinking through computer network to complete logical thinking work. Artificial intelligence literally means to simulate people, including people's hearing ability, olfactory ability and so on, so that the computer can automatically analyze and deal with problems and finish the work efficiently [4]. Artificial intelligence can fundamentally solve the uncertain problems and demonstrate its ability to deal with fuzzy language. When we use computers that can't know the specific model in the actual application process, artificial intelligence technology can completely avoid this defect. The subject knowledge involved in this technology is multifarious, including psychology, physiology, linguistics and other key subjects. Artificial intelligence needs to effectively distinguish between human intelligence and natural intelligence. With the help of system equipment, machines can simulate human activities and complete corresponding operation instructions. It can also be said that

artificial intelligence has now become the core of computer technology. Computers use artificial intelligence to scientifically and systematically integrate data resources and improve work efficiency. The optimization of artificial intelligence and the further application of artificial intelligence in computer networks are the development focus of computer technology in the future.

## 3. Advantages of Artificial Intelligence Technology

#### **3.1** Cooperation Ability

With the development of computer network technology, the network scale is also gradually expanding and the network structure is gradually complicated. As the management mode of the network system is relatively single, the hierarchical management of the network system should be strengthened. Artificial intelligence can well distinguish between natural and human intelligence, and simulate human activities through the functions of system equipment, strictly fulfill the instructions given by human beings, and promote and guide the progress of computer technology. Therefore, artificial intelligence can be used as the core technology development to solve knowledge problems such as numerical calculation and problem solving. In other words, based on the excellent characteristics of artificial intelligence, it can realize the efficient guarantee of network management [5]. At present, the technology has been able to protect human intelligent activities through simulation equipment and systems, and complete corresponding tasks under system instructions. As a multi-disciplinary integration, its application technology is closely related to the development of artificial intelligence and computer technology to a certain extent, and takes it as the decisive factor for its own development. In hierarchical management, it can be mainly divided into three levels, of which the middle management is monitored by both the upper level and the lower level. During the system management, different managers need to cooperate with each other, and labor can only have certain agent cooperation distribution function in the system. Therefore, due to the introduction of the concept of fuzzy logic in intelligent network management, network management can effectively deal with the problem of fuzzy information processing. Therefore, the management and control of uncertain factors and agnostic problems can be realized, and the effective operation of the network system can be realized.

## 3.2 Ability to Explain Reasoning

At present, network management personnel need to use network management protocols during actual management, but such management protocols can only manage some inventory information. The network structure has become more and more complex, but it also makes network management create hierarchical division through polling mode, and upper management personnel monitor and monitor the next level of management personnel. Artificial intelligence is the logical, systematic and flexible management of data information, so the application of artificial intelligence in computer network system enables computer network operation to be more scientific, efficient and stable [6]. It has not been effectively implemented during the actual application, and is only used for network monitoring. However, with the help of artificial intelligence technology, it is easy to interpret and learn lower-level information so as to better obtain higher-level information. At the same time, there is also a problem of cooperation between managers at different levels. And the application of artificial intelligence technology. Through the idea of multi-agent cooperation and distribution, managers at all levels can cooperate effectively. The ability of computer network technology has been greatly developed.

#### 3.3 Less Resource Consumption

With the help of different search algorithms, difficult analysis can be calculated, but during the actual calculation, the amount of calculation will increase due to the increase in the size of the controlled object, which will affect the actual speed of network control. In the operation of the computer system, there are many uncertainties and unknowable problems. Traditional management technology is difficult to deal with these problems effectively in time, while artificial intelligence

technology can effectively deal with uncertainties and unknowable problems through simulation of human activities [7]. In addition, intelligent analysis of various data based on actual needs can effectively promote network optimization in intelligent network characteristic evaluation. As a form of development of human intelligence technology, artificial intelligence technology has a good ability to solve non-linear problems at this stage. It is mainly to convert low-level data into highlevel data. This process is to input data with lower difficulty, and then carry out corresponding logical analysis and reasoning, and finally obtain data with higher level. At this time, when these algorithms are introduced into computer network management, the management system will have strong fuzzy information processing capability, and then the management efficiency and control quality of the system will be greatly improved.

#### 3.4 Nonlinear Processing Capability

Due to the unpredictable characteristics of network load, topology and user behavior in network structure, it is difficult for network management to ensure that the actual control objects have high linearity. Therefore, the original network control theory cannot better manage the security of the computer network. In the process of daily operation, the artificial intelligence system can learn and explain low-level information, reason high-level information and concepts, and then make effective management and control. The experience of intelligent network optimization is classified as a model from premise to conclusion, and fuzzy factors are introduced to reflect the uncertainty of knowledge. Case expression is to describe the optimization of intelligence is introduced into computer network technology, which enables the computer network to have the same logical thinking ability as human beings and to analyze and process some complex and fuzzy data. In the artificial intelligence system, with the aid of artificial intelligence technology, non-linear problems can be properly handled, facilitating the effective application of artificial intelligence technology in computer networks.

## 4. The Necessity of Applying Artificial Intelligence in Computer Network Technology

#### 4.1 The Computer Network Technology Has Its Own Defects

With the continuous expansion of the application scope of computer network technology, its application value is becoming more and more obvious, but its defects in network security are also gradually exposed, such as illegal invasion, malicious tampering, viruses and Trojan horses, etc., which will directly threaten the security of network data information transmission and storage. Network monitoring and monitoring capability has become an important factor that directly affects the application scope of computer network [8]. The current network structure generally adopts polling method, that is, management is carried out at different levels, and management is carried out step by step, which requires cooperation and communication among personnel at all levels. Multiagent cooperative distributed thinking in artificial intelligence can coordinate the communication among various management levels and realize more efficient network control management. Artificial intelligence technology, especially in data operation, has high quality level, especially fuzzy control method. It can not only choose the best solution for the solution, but also greatly improve the running speed [9]. The simple data logical analysis and processing capability of computer network technology cannot guarantee the authenticity of data. The contradiction between this functional defect and the actual demand of users to accurately screen real and useful information in massive data is becoming more and more prominent. In the process of reasoning by applying relevant rules, artificial intelligence can take the existing network operation events as the core of work, and optimize the thinking of experts through fuzzy knowledge base simulation.

## 4.2 The Effect of Artificial Intelligence Applied in Computer Network Technology

Artificial intelligence has the ability of fuzzy processing of uncertain information, so when it is applied to computer network technology, it can eliminate the information processing process of fixed mathematical models and directly process information similar to human thinking, thus providing possibility for the long-span development of the network. Fuzzy control method in artificial intelligence can quickly select useful data from massive data, greatly improving the speed of data processing and data retrieval. Artificial intelligence has shown great advantages in dealing with non-linear problems and will not occupy more resources. It has extremely high computational efficiency. Only one-time search can find the best solution. Computer processing has obvious advantages. On the one hand, it can effectively integrate network resources; on the other hand, it can share and transmit resources. Applying it to computer network technology plays a positive role in improving the use efficiency of network resources and creating greater benefits [10]. At the same time, we collect, analyze and summarize. Then the resources are put into the system, combined with logic processing, and finally a diagnostic evaluation system with expert experience set is formed. It can quickly match and solve similar problems in this particular field. At present, the development of computer technology is also largely based on artificial intelligence technology, which upgrades the past simple data calculation to an information processing mechanism, mainly due to the support of artificial intelligence technology.

## 5. Application Analysis of Artificial Intelligence in Computer Network Technology

## 5.1 Application in Safety Management Technology

## **5.1.1 Firewall Aspect**

The artificial intelligence applied in this aspect is mainly intelligent identification technology, i.e. direct identification and targeted processing of document information existing in computer network through probability, statistics and other calculations, so as to simplify the calculation program of computer network management and further improve the actual efficiency of firewall security management. Stop and intercept those harmful information, so as to ensure the safety of the computer to a certain extent. The application of artificial intelligence in this field makes our computer system have automatic prevention system. It can simplify large-scale examination matching calculation and effectively improve the ultimate value of network behavior recognition ability. In order to realize the effective control of direct network access, effectively reduce the harm and prevent the harm of computer network user information. Through the construction of intelligent firewall, not only can the encrypted SSL data stream be directly intercepted by the firewall, but also external access with security threats can be effectively controlled. The application of intelligent firewall technology is very important to our computer, which also protects the security of information in the computer to a great extent, so that our enterprise can develop more healthily and people's daily life can proceed more orderly.

## **5.1.2 Intrusion Detection**

At present, the applied artificial intelligence technology mainly includes the following kinds: First, rule-based expert system, which is based on the database and reasoning mechanism formed by expert experience. Before security problems occur, the security management personnel actively express a large number of possible intrusion features with rule codes and form a database. Then the generated report is sent to the user in the first time by programming, so that we can detect the invading virus in the shortest possible time, thus ensuring the safety of the computer to a great extent. In fact, intrusion detection does not affect the performance of the network, but also enables users to avoid internal attacks, external attacks and operation failures. The intelligent anti-spam system is protected from the information portal of the user's mailbox. Artificial intelligence technology has superior self-learning and memory ability, and also has excellent performance in data analysis and calculation. On this basis, we can identify anomalies, risks and threats of computer systems in a short time. This technology simulates the learning and memory functions of the human brain. In the process of operation, it will use the audit program to accurately extract the characteristics of network connection and host session, and memorize the contour rules of the computer under normal conditions. In case of abnormality, it will be determined that there is intrusion and the comprehensiveness of intrusion detection will be ensured.

## 5.2 Application in System Management and Evaluation Technology

## **5.2.1 Problem Solving Technique**

Under certain conditions, to solve a certain kind of problem in a limited calculation step is the problem solving technology, which mainly includes the following kinds: first, search technology, the same problem corresponds to multiple search technologies. There are also some problems in the process of computer operation. Through the expert database in artificial intelligence, the cause of the problem can be found in time, and the computer system can be maintained in time, making the computer safer in the application process. As long as the data is transmitted in the computer system, virus queries can be automatically carried out, and once abnormal conditions are found in the data information, various network faults can be differentiated and analyzed according to a pre-established program. It is usually expressed by the sum of the shortest paths in two search spaces of the network. The application of search technology can improve the utilization efficiency of network resources and the response efficiency of system management and evaluation. This technology is based on the state diagram [7]. The prominent feature of this technology is its strong learning and memory functions. The application of this technology in safety management can effectively improve the pertinence and effectiveness of detection.

#### 5.2.2 Expert Knowledge Base Technology

The establishment degree of expert knowledge base is directly related to the operation of expert system. At present, the process of establishing expert knowledge base is mainly based on mature theories and relevant expert experiences. The intelligent management mode provided by artificial intelligence technology will effectively improve the management efficiency of the school, and will also reduce the expenditure of various resources, such as human resources, material resources, management resources, etc., in fact reducing the cost budget of school management, which is a long-term management mechanism. The expert system in security management can take these rules and audit records as important basis for judging intrusion detection, discover intrusion behaviors in time, and judge the hazards and types of intrusion behaviors. On the basis of sorting, coding and determining the rules, the expert knowledge base is established. Before the system management, the administrator can directly obtain the management scheme of similar situation in the expert knowledge base through the corresponding coding retrieval. This technology can ensure the safe use and integrity of the actual system resources, at the same time, it can also screen and process different data, and finally effectively record the data information, thus ensuring the timeliness of network information security.

# **5.2.3** Application and Development Direction of Artificial Intelligence in Computer Network Technology

At present, the application of artificial intelligence in computer network technology is mainly focused on improving the security and management ability of computer network. In the future, with the continuous deepening of the research on artificial intelligence, the application of artificial intelligence in computer network technology will be more extensive. In combination with the current development trend, I think artificial intelligence will continue to deepen in computer network technology, develop towards refinement and integration, and become the basic support of various industries. With the introduction of expert decision-making in artificial intelligence, expert knowledge and experience can be gathered, so that not only can actual users solve basic user problems, but also computer dynamics. Strengthening the user interface friendliness of computer programs through artificial intelligence; Based on artificial intelligence system, the artificial intelligence mechanism supporting environment and software development is determined. With the application of artificial intelligence, the performance of computer network technology, which originally did not have learning function, memory function and adaptation function, has been

significantly improved in hazard identification, real and accurate positioning of massive data, etc. We must strengthen the research on artificial intelligence technology and computer network technology, actively introduce advanced technologies at home and abroad, integrate artificial intelligence technology into computer network more organically, and finally realize comprehensive, coordinated and sustainable development of computer network technology.

## 6. Conclusion

Through the above analysis, it can be found that people have realized that the application of artificial intelligence in computer network technology is an inevitable choice for computer network technology to adapt to the development of the times and meet the needs of modern users. When the artificial intelligence should be transported to the computer network technology, the correctness of the application must be ensured. Computer network technology and artificial intelligence have now developed into an inseparable whole. Artificial intelligence has been applied to all aspects of computer network technology, making computer network more stable, efficient and safe. We must treat it as a systematic project and adopt all-round development strategies, such as increasing support for artificial intelligence, introducing advanced computer network technology can make the services accepted by people humanized and intelligent, effectively improve the work efficiency, improve the level of network management, and promote the development of computer network technology towards a long-term sustainable direction.

## Acknowledgment

2016 Shandong University Science and technology plan: Research on multi-target detection and tracking technology based on video (J16LN59)

Ministry of education production university cooperation education project: Software engineering in the background of new engineering (School enterprise cooperation) On the reform of practical teaching(201901173025)

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