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# Application of Artificial Intelligence in Computer Network Technology

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**Abstract:** ***In recent years, China attaches great importance to the research of science and technology, especially artificial intelligence as the core topic for research, and has made certain achievements. The emergence of computer network technology makes many industries show a trend of rapid development, and the development of artificial intelligence technology also needs the support of computer technology, which is also worthy of in-depth analysis by researchers. At present, the combination of computer network technology and artificial intelligence is the mainstream trend of future development, which not only contributes to the improvement of people's life quality but also promotes the improvement of work efficiency. Based on this, the paper discusses the application of artificial intelligence in computer network technology to promote the stable development of computer technology.***

**Keywords:** Artificial intelligence; Computer network technology; Application.

## 1. INTRODUCTION

At present, China is in a new normal of rapid economic development, and the application of network technology to computers is becoming increasingly widespread. New labor technologies occupy more and more industrial foundations, and in local enterprises, technology and work methods are being innovated. However, due to the immaturity of technology, there have been some problems in the development of computers in China, such as inadequate protection of personal privacy and the inability of technology to keep up with the needs of the times. In order to better adapt China's computer network technology to its national conditions, the combination of artificial intelligence and computer network technology has brought a lot of convenience to our country.

## 2. OVERVIEW OF ARTIFICIAL INTELLIGENCE

Artificial intelligence is a result of the development of computer technology, closely related to computers. It can mimic some of people's behaviors or thoughts and use robots to replace human labor to complete some tasks. Essentially, artificial intelligence applications enable mechanical devices to simulate humans and carry out related tasks by allowing operators to issue operational instructions to AI devices. It can be seen as a new intelligent ensemble after natural intelligence and human intelligence. Artificial intelligence achieves the goal of simulating human thinking with computer thinking by inputting code during the compilation process of computers, thereby completing some more complex, fuzzy, and tedious data processing tasks. At the same time, computers can simulate various senses and ways of thinking of humans to a certain extent, that is, machines "think like humans", "act like humans", and "think rationally". In the face of the continuous development of computer networks, artificial intelligence is effectively integrated into computer network technology, interacting and influencing each other to modernize and machine the data in the network, and obtain valuable data from it, which is transmitted back to users and effectively helps them solve the problems they encounter. Recent advancements in artificial intelligence (AI) and machine learning have demonstrated transformative potential across diverse domains, from natural language processing to urban sustainability and healthcare. In natural language processing, Zheng et al. (2024) conducted a comparative study of advanced pre-trained models for named entity recognition, highlighting their effectiveness in extracting structured information from unstructured text[1]. Similarly, Fan et al. (2025) proposed an online update method for Retrieval-Augmented Generation (RAG) models using incremental learning, addressing the challenge of keeping AI systems up-to-date with evolving data[3]. In the realm of urban development, Zhou et al. (2024) optimized an automated garbage recognition model using ResNet-50 and weakly supervised CNNs, contributing to sustainable urban management practices[4]. Meanwhile, Huang et al. (2024) explored the role of federated learning in promoting trustworthy and responsible AI, emphasizing its potential to enhance data privacy and security in collaborative systems[7]. In healthcare, Pang et al. (2024) leveraged electronic health records for data-driven diabetes knowledge discovery and risk prognosis, showcasing the application of AI in improving disease management[9]. Additionally, Yin et al. (2024) utilized deep learning for crystal system classification in lithium-ion batteries, demonstrating its utility in advancing energy storage

technologies[8]. In the creative domain, Xu et al. (2025) developed AI-enhanced tools for cross-cultural game design, enabling collaborative character conceptualization and sketching, which underscores the intersection of AI and creative industries[2]. Furthermore, Yang et al. (2023) introduced HGMatch, a hypergraph-based approach for subgraph matching, addressing challenges in complex data structures[5]. Lastly, Tang and Zhao (2025) investigated the relationship between aging population distribution and real estate market dynamics using neural networks, highlighting AI's role in socioeconomic analysis[6].

## 3. THE APPLICATION ADVANTAGES OF ARTIFICIAL INTELLIGENCE IN COMPUTER NETWORK TECHNOLOGY

### 3.1 Improve hierarchical management

The development of a country cannot be separated from the support of science and technology, and the improvement of technological level has created conditions for the development of various industries. Therefore, the research on computer network technology has become a hot topic worldwide. Currently, the application of computer network technology is significant, especially artificial intelligence has become the main driving force for industry development. It is worth noting that network technology is a complex technology that provides technical support for the operation of computers. The traditional hierarchical management model only stays at the primary stage and cannot fully realize the value of computer network technology, resulting in poor management efficiency. Artificial intelligence technology emphasizes interaction, simplifies complex computer network technology, and improves management efficiency and quality. It can be seen that the integration of artificial intelligence technology has broken the communication constraints of traditional computer network technology hierarchical management, achieved information exchange between different departments, shared some resources with the help of network technology, solved the problem of insufficient communication in hierarchical management, and ensured the further improvement of computer network technology.

### 3.2 Ability to process network information

Artificial intelligence technology has significant advantages in the way information is processed. Firstly, computer networks need to receive a large amount of information resources during operation, many of which are not very accurate and clear. How to process this information to optimize resources reasonably is a difficult problem. Artificial intelligence itself has the characteristic of automated information analysis. By applying this advantage to the analysis and processing of information, it can infer and integrate vague and inaccurate information, strengthen the management of network information, and improve the ability to apply network information.

### 3.3 Promote the improvement of productivity

Artificial intelligence does not require a large amount of energy investment. This feature is reflected in the fact that no matter how complex the network data calculation and processing process is, artificial intelligence can use its extremely fast speed to find the most ideal processing method, which avoids the huge amount of computation on the one hand; On the other hand, it reduces energy consumption during computation and promotes a practical improvement in computation speed. The application of artificial intelligence will further promote innovation, which can be reflected in multiple aspects, such as effective resource management. In the future, more intelligent systems will enter the industrial field, and artificial intelligence is also a new driving force for the development of the industrial field. This process is relatively complex and requires the establishment of corresponding application scenarios. It will automatically perform data collection and reporting tasks, and personnel in the organization will spend more time making decisions and taking action. This means that everyone's economic productivity will increase, thereby improving the productivity of the entire team. Scalable, typically starting from a pilot project, quickly transforming it into full-scale production, and scaling up as demand grows.

## 4. THE SPECIFIC APPLICATION OF ARTIFICIAL INTELLIGENCE IN COMPUTER NETWORK TECHNOLOGY

### 4.1 Strengthen network security

With the development of technology, computer network technology has brought not only economic improvements, but also convenience in daily life. However, the network security issues it has caused cannot be ignored. In order to

prevent security risks in computer network technology, artificial intelligence technology must be integrated to ensure network security. Firstly, artificial intelligence technology is highly targeted. Traditional computer network technology emphasizes information processing and neglects security issues, making it impossible to achieve real-time monitoring of the network. Artificial intelligence technology has made up for this deficiency by implementing 24-hour monitoring of network information. Once a problem occurs, it can quickly identify the cause of the problem and provide timely processing. Secondly, artificial intelligence technology has become a barrier against viruses. The existence of artificial intelligence technology makes it impossible for software carrying viruses to approach computers, creating a secure computer operating environment and providing security for user information. Email software is one of the essential software for computers, but it has also become a way for hackers to invade. The process of receiving and sending emails is the process of virus invasion. At this time, artificial intelligence technology will verify the email information one by one, intercept spam emails, and directly delete virus emails to ensure the security of the computer. Finally, artificial intelligence technology adds firewall functionality. Its main purpose is to check and kill the internal software of the computer, which can not only prevent virus invasion, but also generate security reports, allowing users to grasp the operating status of the computer network.

### 4.2 Application in Computer Network System Management and Evaluation

In order to better develop computers, in reality, artificial intelligence technology needs to be effectively integrated with computer network systems and control, and evaluated using artificial intelligence technology to comprehensively manage computer networks. Because the management and evaluation of computer network systems are often disrupted by various network changes, especially with the advancement of network intelligence, the difficulty of evaluating the control of computer network systems continues to increase. By introducing AI expert decision-making, specialized knowledge and experience can be gathered. Therefore, users not only need to solve basic problems, but also can help computer systems perform corresponding system evaluations, so as to timely grasp the actual computer dynamics. Applying artificial intelligence technology to current computer network management and system evaluation can further improve the quality and management capabilities of computer networks, while also ensuring that computers can be fully utilized.

### 4.3 Online Education and Teaching

Internet information technology has developed rapidly. With the application of Internet information technology in education, education and teaching are no longer limited to face-to-face teaching between teachers and students in the classroom. The combination of Internet information technology and computer technology has enriched the teaching form and content, increased the communication between teachers and students, diversified teaching forms have made teaching no longer boring, and improved students' enthusiasm for learning. However, how to balance every student in the class during teaching remains a difficult educational problem. The application of artificial intelligence in computer network technology has greatly improved teaching efficiency. In recent years, various online education and teaching software have emerged on the market. By intelligently analyzing students' answers, interactions, and completion of homework during class, it helps teachers understand students' learning situation, facilitates targeted guidance for students, greatly improves teaching efficiency, and helps students improve their academic performance.

### 4.4 Smartphones and smart home appliances

Computer networks have played their role in various aspects of modern life, changing people's way of life. Another major reform of artificial intelligence in computer networks is the smartphone. The rapid development of smartphones has achieved generation after generation replacement within a few years, and their functions have gradually evolved from camera and video to more advanced features such as fingerprint unlocking and facial recognition. With the use of smartphones, it is possible to connect with computers anytime and anywhere. Nowadays, we can see that people are mostly using smartphones to interact with others, using communication software to communicate with them, and using smartphones to find entertainment while waiting. Even our payment methods have shifted from cash payments to mobile electronic payments.

### 4.5 Intelligent Navigation and Positioning

With the development of the economy and the improvement of people's living standards, cars have become the means of transportation for most families. The navigation technology in artificial intelligence can help us choose

the best travel route during our journey, and we can also follow the navigation route when driving in unfamiliar places. With the application of artificial intelligence technology, cars can also achieve autonomous driving. By programming autonomous driving programs for cars, with the cooperation of various systems such as artificial intelligence, radar monitoring, and global positioning, cars can safely travel along normal routes without human intervention.

## 5. CONCLUSION

Against the backdrop of rapid technological development, artificial intelligence has been continuously promoted and its role has begun to strengthen. At the same time, the scientific integration of artificial intelligence into computer network technology has been applied to every subtle aspect of computer network technology, promoting the rapid development of computers. However, the development of any technology will encounter difficulties, and in order to fully utilize the value of artificial intelligence in computer network technology, more exploration and efforts are needed in the application of artificial intelligence technology.

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