

Original Paper

Analysis of the Application of Artificial Intelligence in Computer Network Technology

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Abstract

The application of artificial intelligence (AI) technology in computer network technology is becoming increasingly extensive and in-depth. This paper analyzes the application of artificial intelligence in network security, network management, Internet of Things, edge computing and network services in detail. In network management, AI technology realizes network traffic optimization, automatic configuration and fault prediction, and improves the efficiency of network management. In the field of Internet of Things, AI technology helps manage and analyze a large amount of device data, supporting the development of smart homes and smart cities. In edge computing, AI technology enhances the data processing capabilities of edge nodes and reduces latency. In network services, artificial intelligence technology optimizes routing, voice recognition and personalized recommendation services. However, the application of artificial intelligence in network technology also faces challenges such as data privacy, computing resources and laws and regulations. This paper aims to provide a comprehensive reference for industry insiders to promote the application and development of artificial intelligence technology in computer networks.

Keywords

Artificial intelligence, Computer network, Network security, Internet of Things, Edge computing

1. Introduction

With the rapid development of information technology, computer networks have become a key infrastructure for social activities and economy. However, the expansion of network scale and the increase in complexity have brought huge challenges to traditional network management and security technologies. Artificial Intelligence (AI) Technology Artificial Intelligence technology can simulate and expand human intelligence, examine various complex network environments, and improve the intelligence level and operating efficiency of the network. Artificial Intelligence (AI) and computer network technology are components of modern information technology. With the rapid development of the Internet and the explosive growth of data volume, traditional important network technologies can no longer meet the urgent and complex network management and security needs. With its powerful

data processing and analysis capabilities, it is gradually penetrating into all aspects of computer networks, improving the level of intelligence and operating efficiency of the network. This paper aims to analyze the specific application of artificial intelligence in computer network technology, explore the opportunities and challenges it brings, and look forward to future development directions.

2. Overview of Artificial Intelligence and Computer Network Technology

2.1 Definition and Development of Artificial Intelligence

Artificial Intelligence (AI) is an important branch of computer science, and its main goal is to study and develop theories, methods, technologies and application systems that can simulate, extend and expand human intelligence. The core of artificial intelligence is to enable computers to perform functions that human intelligence usually requires to complete tasks, such as understanding natural language, recognizing images, learning and reasoning.

Since the 1950s, the development of artificial intelligence has gone through several stages. The 1950s and 1960s were a period of artificial intelligence, and research during this period focused on areas such as logical reasoning and problem-driven. Due to the limitations of computing power and data resources, early AI systems performed poorly in dealing with complex problems. From the 1970s to the early 1980s, AI research entered a trough period, but the emergence of expert systems revitalized AI technology. The system simulated the decision-making process of experts by humans and achieved remarkable results in medical diagnosis, chemical process control and other fields.

In the 1990s, with the improvement of computing power and the rise of big data, machine learning became a hot spot in AI research. Machine learning enables computer systems to automatically learn and improve from data through algorithms, thus making breakthrough progress in areas such as image recognition, speech recognition, and natural language processing. Since the 21st century, deep learning, as a branch of machine learning, has promoted the rapid development of AI technology with its powerful data processing capabilities and precise predictive performance.

At present, artificial intelligence has achieved remarkable results in many fields. For example, the application of deep learning in computer vision and speech recognition has made technologies such as autonomous driving and intelligent customer service a reality; language processing technology has made applications such as machine translation and voice assistants more automated and humanized. With the continuous optimization of algorithms, the improvement of computing resources and the enrichment of data resources, artificial intelligence promises to continue to expand its application scope in the future and promote the automation transformation of all walks of life.

2.2 Definition and Development of Computer Network Technology

Computer network technology refers to the technology of connecting decentralized and independent computer systems through communication equipment and lines to achieve data communication and resource sharing. It covers multiple aspects from physical connection to network protocol, network management and application services, aiming to build an efficient, reliable and secure communication

and computing environment.

The development of computer network technology can be traced back to the 1960s. The initial network form was the local area network (LAN), whose main purpose was to connect computer systems within the same local area to achieve resource sharing and data transmission. It promoted the maturity of technologies such as broadband (Ethernet) and wireless broadband (WLAN), making it possible for computer devices in office environments and homes to be interconnected.

Entering the 1970s, with the popularization of applications and the increase in demand, wide area network (WAN) technology came into being. Wide area networks connect geographically dispersed computer networks through long-distance computer communication lines to support cross-regional data communication and resource sharing. The emergence of the Internet is an important milestone in computer network technology. In the late 1980s, with the standardization and popularization of the TCP/IP protocol, the Internet gradually developed and achieved global interconnection in the early 1990s.

The rapid development of the Internet has greatly promoted the rapid transmission and sharing of information, making applications such as e-mail, web browsing, and e-commerce a part of daily life. Since the 21st century, with the advancement of mobile communication technology and the interconnection of smart terminals, mobile Internet has become a new hot spot in the development of network technology. The integrated application of emerging technologies such as cloud computing, big data, and the Internet of Things has further expanded the application scope and service capabilities of computer networks.

The development of computer network technology has not only improved the speed and efficiency of information transmission, but also promoted the digital transformation of social economy. In the future, with the gradual maturity of technologies such as 5G, edge computing, and quantum communication, computer network technology will continue to move towards higher speed, lower latency, and higher security, providing a solid foundation for various intelligent applications and services.

2.3 The Combination of Artificial Intelligence and Computer Network Technology

The combination of artificial intelligence (AI) and computer network technology is an important trend in the current development of science and technology. This combination shows great potential and application prospects in many fields. First, in terms of network security, artificial intelligence can automatically detect and respond to network attacks through machine learning algorithms. Traditional network security measures usually rely on predefined rules and signature libraries and cannot cope with new types of attacks. AI technology can analyze large amounts of network traffic data, identify abnormal behaviors, and adjust defense strategies in real time, thereby providing more intelligent and dynamic security protection. For example, deep learning algorithms can be used to detect complex intrusion behaviors and even predict potential attack patterns. Secondly, in terms of network optimization and management, artificial intelligence can significantly improve the performance and efficiency of the network. Through machine learning and data analysis, AI can automatically optimize

network traffic, adjust routing strategies, reduce latency and congestion, and improve bandwidth utilization. Intelligent network management systems can be dynamically adjusted based on real-time data to ensure optimal allocation of network resources to meet user needs. AI can also be used to automate network configuration and fault diagnosis, reduce the occurrence of network failures through predictive maintenance, and improve network stability and reliability. In addition, the combination of artificial intelligence and Internet of Things (IoT) technology is also driving the development of smart networks. AI can process data from a large number of IoT devices, provide real-time analysis and decision support, and promote the development of smart homes, smart cities, and smart industries. For example, intelligent transportation systems use AI to analyze traffic data, optimize traffic lights and traffic flow, and reduce congestion and pollution. Finally, the application of AI in edge computing is also expanding. By moving computing power down to the edge of the network, AI can process data locally, reduce latency and bandwidth consumption, and improve response speed. This is of great significance for application scenarios that require real-time data processing and decision-making, such as autonomous driving and industrial automation. In short, the combination of artificial intelligence and computer network technology has not only promoted the intelligence of network security, optimization, and management, but also promoted the development of IoT and edge computing, providing innovative solutions and application opportunities for all walks of life. As technology continues to advance, this combination will play an increasingly important role in the future.

3. Application of Artificial Intelligence in Network Security

3.1 Intrusion Detection and Defense

The application of artificial intelligence technology in intrusion detection systems (IDS) has significantly improved its detection accuracy and response speed. Traditional intrusion detection systems mainly rely on predefined rules and feature libraries to match known attacks. However, with the continuous development of network attack methods, this method is unable to cope with the scope of new and unknown attacks. By introducing machine learning algorithms, IDS can dynamically learn and analyze network traffic data to identify abnormal behaviors and potential threats. Machine learning algorithms such as support vector machines (SVMs), random forests, and neural networks can classify and predict network traffic and automatically identify abnormal patterns.

Deep learning further enhances the ability of intrusion detection. Through gradient neural networks (CNNs) and gradient neural networks (RNNs), IDS can process complex network data, improve multi-level features, and significantly improve detection accuracy. In particular, unsupervised learning methods based on self-learning encoders and generative adversarial networks (GANs) can be trained on data sets without pre-labels to discover unknown attack behaviors. In addition, AI technology can also optimize the response mechanism of IDS. Through real-time analysis and automation, the application of AI technology in intrusion detection and defense provides a more powerful means of protection for network security.

3.2 Malware Detection and Prevention

Traditional malware detection methods mainly rely on feature code matching to detect known malware through pre-defined feature libraries. However, with the rapid evolution of malware and the continuous emergence of variants, this method is stretched to its limits when targeting new malware. Artificial intelligence technology, through deep learning algorithms, has significantly improved the ability to detect and prevent malware. Deep learning algorithms, such as convolutional neural networks (CNNs) and recurrent neural networks (RNNs), can analyze the behavioral characteristics of malware, not just static feature codes.

Artificial intelligence can analyze the behavioral patterns of monitoring processes, identify their unknown behaviors, and process monitoring processes based on behavioral changes. Artificial intelligence can analyze abnormal information in monitoring processes and perform dynamic detection and prediction based on abnormal information. Artificial intelligence can analyze various behaviors in monitoring processes and make predictions and prediction accuracy based on abnormal information.

In addition, artificial intelligence technology can also achieve real-time monitoring and automated response, and maintain efficient detection capabilities for new malware through continuous learning and updating. This not only improves the accuracy and timeliness of detection, but also greatly reduces the false alarm rate, providing a more reliable guarantee for network security.

3.3 Network Threat Intelligence Analysis

Network threat intelligence analysis is an important direction in the field of network security, aiming to identify potential network threats and provide decision support by collecting and analyzing various threat intelligence data. The application of artificial intelligence technology in this field has greatly improved the efficiency and accuracy of intelligence level analysis. AI technology can process and analyze a large amount of threat intelligence data through machine learning and deep learning algorithms to extract valuable information.

Natural language processing (NLP) technology is an important tool for AI in threat intelligence analysis. Through NLP technology, AI systems can extract key information from text data from various sources (such as security reports, news articles, social media, etc.) and perform automated intelligence extraction and classification. Machine learning algorithms can extract and correlate intelligence data to identify potential threat patterns and attack chains.

In addition, AI technology can also analyze historical threat data, predict possible future attack behaviors, and provide early warning and decision support for security experts. For example, deep learning models can analyze historical attack events to discover the patterns and goals of attackers' behavior and help security teams deploy defense measures in advance. In general, the application of artificial intelligence in network threat intelligence analysis not only improves the accuracy and timeliness of intelligence analysis, but also provides more comprehensive and in-depth protection for network security.

4. Application of Artificial Intelligence in Network Management

4.1 Network Traffic Analysis and Optimization

The application of artificial intelligence technology in network traffic analysis and optimization has greatly improved the overall performance and stability of the network. Traditional network traffic management methods mainly rely on pre-set rules and manual intervention, which is difficult to cope with complex network changes. By introducing AI technology, the network management system can realize real-time analysis and prediction of network traffic, identify the main congestion points and potential failure points of the network, and thus optimize the allocation of network resources.

Machine learning algorithms, such as time series analysis and regression analysis, can be used to predict the changing trend of network traffic. By modeling historical traffic data, the AI system can predict traffic peaks and potential congestion points in advance, helping network administrators to take measures in advance of peak periods, such as adjusting bandwidth, optimizing routing strategies, etc., to avoid network congestion. In addition, deep learning algorithms, such as long short-term memory networks (LSTM), perform well in processing complex time series data, which can further improve the accuracy of traffic prediction.

Real-time traffic monitoring and anomaly detection are important components of network traffic analysis. Through AI technology, network management systems can monitor network traffic in real time and identify abnormal traffic patterns, such as sudden monitored traffic surges or abnormal traffic distribution, which may be network attacks. Automated traffic analysis tools can immediately issue alarms when anomalies are found, and take corresponding measures, such as speed limiting, blocking abnormal source IPs, etc., to ensure the security and stability of the network.

In addition, AI technology can also be used for traffic classification and priority management. Through machine learning algorithms, network management systems can classify and prioritize traffic according to application types and business needs. For example, real-time applications such as video streaming and voice calls can be given higher priority to ensure user experience. Through customized traffic management and optimization, AI technology helps network administrators better utilize existing network resources, improve the overall performance of the network and improve user satisfaction.

4.2 Automated Network Configuration and Management

Traditional network configuration and management usually require a lot of manpower input, and it is easy to have configuration errors, resulting in network failures and security vulnerabilities. The introduction of technology provides a new solution for network configuration and management. Through artificial intelligence algorithms and automation tools, AI technology can significantly improve the configuration efficiency and accuracy of network equipment, reduce human errors, and improve management level and efficiency.

The application of AI technology in automated network configuration is mainly reflected in the optimization configuration strategy of intelligent algorithms. Machine learning algorithms can find the best configuration solution by analyzing historical configuration data and network performance data.

Adaptive configuration systems can automatically adjust device configuration parameters, such as routing tables, switching policies, bandwidth allocation, etc., according to the real-time status of the network and business needs, to ensure that the network can achieve optimal performance under different load conditions.

The application of deep learning algorithms enables network management systems to handle more complex configuration scenarios. Through technologies such as nonlinear neural networks (CNN) and generative adversarial networks (GAN), AI systems can simulate various network environments and configuration policies to perform automated configuration testing and optimization. Automated network configuration tools can automatically configure and debug new devices when they are online, reducing configuration time and error rates.

Artificial intelligence technology can also be used for intelligent monitoring and management of network equipment. By monitoring the operating status of network equipment in real time, AI systems can detect abnormal behavior and potential failures of equipment. The intelligent management platform can automatically monitor and adjust configuration policies, such as load balancing and fault isolation, according to the health status of the equipment to ensure high availability and reliability of the network. In addition, AI technology can also automate fault handling, quickly locate and repair fault points through real-time analysis and diagnosis, and reduce the impact of network failures on business.

In summary, the application of artificial intelligence technology in network configuration and management not only improves efficiency and accuracy, but also enhances the configuration level and management capabilities of the network. With the continuous development of artificial intelligence technology, network configuration and management will be more efficient, automated and standardized, providing sufficient guarantee for the stable operation of the network and the development of business.

4.3 Network Fault Prediction and Processing

Network fault prediction and processing are the key to ensuring network stability and business continuity. Traditional network fault handling methods are usually passive responses, that is, diagnosis and repair after the fault occurs, which is difficult to prevent and respond quickly in time. The application of artificial intelligence technology, especially machine learning and deep learning algorithms, provides new methods and means for network fault prediction and processing.

Through AI technology, the network management system can monitor and analyze the status of network equipment in real time and predict possible operational failures. Machine learning algorithms, such as support vector machines (SVMs), decision trees, and random forests, can model and analyze the operating data of network equipment and identify potential failure modes and abnormal behaviors. Deep learning algorithms, such as long short-term memory networks (LSTMs) and autoencoders, can process complex time series data and make more accurate predictions of device status.

The application of AI technology in fault prediction can not only detect potential equipment failures in advance, but also perform cause analysis and fault location. By analyzing historical fault prevention data, AI systems can identify the causes and symptoms of common faults and provide predictive

maintenance recommendations. For example, some network equipment may cause failures when there are phenomena such as abnormal temperature, traffic fluctuations, or unstable power supply. The installed fault prediction system can issue an alarm in time when these abnormal phenomena occur, and guide maintenance personnel to perform preventive inspections and repairs.

In terms of fault handling, AI technology can realize the automation and automation of fault diagnosis and repair. Through natural language processing (NLP) and knowledge graph technology, AI systems can extract useful information from a large number of technical documents and fault records to generate fault handling solutions. Automated fault handling tools can immediately perform diagnostic and repair operations after a fault occurs, such as restarting the device, replacing faulty components, or adjusting configuration parameters, etc., to reduce the impact of the fault on the network and business.

In addition, AI technology can also optimize the fault handling process, analyze the data in the fault handling process through machine learning algorithms, identify bottlenecks and optimization points, and improve fault handling strategies and methods. The automated fault management system can monitor and record the entire fault handling process, provide data support and decision-making reference, and improve the efficiency and effectiveness of fault handling.

In summary, the application of artificial intelligence technology in network fault prediction and processing not only improves the accuracy and timeliness of fault prediction, but also enhances the automation and automation level of fault handling. Through the introduction of AI technology, the network management system can better ensure the prevention and response to network failures, the stable operation of the network and the continuity of business.

5. Application of AI in IoT

5.1 IoT Device Management

The number of IoT devices is huge and the types are diverse. Traditional management methods face many challenges, such as device status monitoring, fault diagnosis, and maintenance. AI technology plays an important role in IoT device management, improving the operating efficiency and reliability of equipment through automation and intelligent means.

First, AI can realize automatic detection and monitoring of IoT devices. Using machine learning algorithms, the system can analyze the status data of the equipment in real time, identify abnormal behaviors, and predict potential failures. For example, by analyzing the historical data and current operating status of the equipment, AI can predict the service life of the equipment, recommend the best maintenance time, reduce the downtime of the equipment, and improve production efficiency. In addition, AI can automatically adjust the parameters of the equipment according to the operating data of the equipment, optimize its performance, and extend the service life of the equipment.

Second, AI can greatly improve the efficiency of fault diagnosis and maintenance. Traditional fault diagnosis usually relies on experience and predefined rules, and it is difficult to detect and solve new faults in time. AI technology can learn and analyze a large amount of fault data, generate fault

diagnosis models, and automatically identify and classify the causes of faults. For example, deep learning algorithms can detect abnormal appearance of equipment, such as cracks and wear, through image recognition technology, and detect potential problems in time. In addition, AI can extract valuable information from the logs and error messages of the equipment through natural language processing technology, and assist engineers in troubleshooting and repairing.

In addition, artificial intelligence can also support adaptive management and optimization of equipment. Through AI algorithms, the system can autonomously adjust the operation strategy of the equipment according to real-time data and preset goals. For example, in smart factories, AI can dynamically assign tasks according to production plans and equipment status, optimize production processes, and improve overall efficiency. In the field of energy management, AI can analyze the power consumption data of the equipment, formulate energy-saving plans, and reduce energy consumption costs.

In short, the application of artificial intelligence in IoT device management not only improves the operating efficiency and reliability of equipment, but also reduces the complexity and cost of management. With the continuous development of AI technology, its application prospects in IoT device management will be broader, providing more intelligent solutions for various industries.

5.2 Data Processing and Analysis

IoT devices generate massive amounts of data every day, and the processing and analysis of these data are crucial to realizing the potential of the Internet of Things. However, traditional data processing methods often seem powerless when faced with such a large amount of data. The introduction of artificial intelligence technology provides an efficient solution for IoT data processing and analysis, which can process and analyze data in real time, extract valuable information, and support business decisions.

First, artificial intelligence has shown strong capabilities in data processing. Through machine learning and deep learning algorithms, AI can process large amounts of data in real time, identify and extract valuable information. For example, in intelligent transportation systems, AI can process data from vehicles and traffic monitoring equipment in real time, analyze traffic flow, predict traffic congestion, and provide optimized traffic management solutions. By quickly processing and analyzing data, AI can help decision makers understand the current situation in a timely manner and make more scientific decisions.

Second, artificial intelligence has significant advantages in data analysis. Traditional data analysis methods usually rely on preset models and rules, and it is difficult to discover implicit patterns and complex relationships in the data. AI technology can automatically discover the laws in the data and generate predictive models through self-learning and training. For example, in the field of intelligent medical care, AI can analyze patients' health data, predict the risk of disease occurrence, and provide personalized health management solutions. In the financial field, AI can analyze market data, predict stock price trends, and assist investment decisions.

In addition, artificial intelligence can also realize data visualization and intelligent reporting. Through

image recognition and natural language generation technology, AI can transform complex data analysis results into intuitive charts and reports to help users better understand the data. For example, in the field of intelligent manufacturing, AI can visualize production data and equipment status data, generate production efficiency analysis reports, help enterprises optimize production processes and improve production efficiency.

In short, the application of artificial intelligence in IoT data processing and analysis provides strong technical support for various industries, and can efficiently process and analyze massive data, extract valuable information, and support business decisions. With the continuous advancement of AI technology, its application prospects in IoT data processing and analysis will be broader, injecting new impetus into the development of the Internet of Things.

5.3 Smart Home and Smart City

The application of artificial intelligence technology in smart homes and smart cities is becoming more and more extensive, and is profoundly changing people's lifestyles and urban management models. Through the application of AI technology, the linkage and automatic control of smart home devices can be realized to improve the quality of life of users; in smart cities, AI technology can be used in traffic management, environmental monitoring, safety protection and other aspects to improve the intelligence level of cities.

In the field of smart homes, artificial intelligence can realize the intelligent linkage and automatic control of equipment. Through voice recognition and natural language processing technology, users can control smart devices in their homes, such as lighting, air conditioning, TV, etc., through voice commands. For example, users can control the light switches in their homes, adjust the air conditioning temperature, play music, etc. through voice assistants, which greatly improves the convenience of life. In addition, AI technology can also automatically adjust the operating mode of the device according to the user's habits and preferences. For example, smart air conditioners can automatically adjust the temperature and wind speed according to the user's living habits and indoor and outdoor temperature changes to provide a more comfortable living environment.

In the field of smart cities, the application of artificial intelligence technology has greatly improved the efficiency and intelligence level of urban management. First, in terms of traffic management, AI can analyze traffic flow data in real time, predict traffic congestion, and provide optimized traffic management solutions. For example, through an intelligent traffic signal control system, the duration of traffic lights can be adjusted according to real-time traffic conditions, traffic flow can be optimized, and congestion and emissions can be reduced. In terms of public safety, AI can monitor the city's public security situation in real time, identify abnormal behaviors and suspicious persons, and improve the city's security protection capabilities through image recognition and video analysis technology.

Secondly, in terms of environmental monitoring, artificial intelligence can analyze environmental data in real time and monitor indicators such as air quality, water quality, and noise. For example, through environmental sensors deployed throughout the city, AI can collect and analyze environmental data in

real time, discover pollution sources, provide governance solutions, and improve the city's environmental quality. In addition, AI can also be used for intelligent garbage sorting and resource recycling. Through image recognition technology, garbage can be automatically identified and sorted to improve resource utilization and environmental protection.

Finally, artificial intelligence also plays an important role in energy management and infrastructure maintenance in smart cities. Through AI technology, the city's energy consumption can be monitored in real time, energy use can be optimized, and energy utilization efficiency can be improved. For example, through the smart grid system, AI can adjust power supply and reduce energy waste according to real-time power demand. In terms of infrastructure maintenance, AI can use image recognition and sensor technology to monitor the city's infrastructure status in real time, predict and prevent facility failures, and improve the city's operation and maintenance efficiency and safety.

In short, the application of artificial intelligence in smart homes and smart cities has not only improved people's quality of life, but also improved the city's management efficiency and intelligence level. With the continuous advancement of AI technology, its application prospects in smart homes and smart cities will be broader, providing new impetus for the development of smart cities and smart life.

6. Application of Artificial Intelligence in Edge Computing

6.1 Concept and Characteristics of Edge Computing

Edge computing is an emerging computing model that transfers computing tasks from the cloud to edge nodes close to the data source to reduce latency and improve edge real-time performance. The computing is characterized by looping, low latency, and high bandwidth.

6.2 Advantages of Artificial Intelligence in Edge Computing

Artificial intelligence technology can perform real-time data processing and analysis on edge computing nodes to improve the response speed and processing efficiency of the system. By deploying artificial intelligence models on edge nodes, local data processing can be achieved, data transmission volume can be reduced, and data privacy and security can be improved.

6.3 Combination of Edge Computing and Cloud Computing

The combination of edge computing and cloud computing can give full play to their respective advantages and realize the rational allocation and utilization of computing resources. By performing large-scale data processing and model training in the cloud and real-time data processing and reasoning on edge nodes, efficient data processing and customized applications can be achieved.

7. Application of Artificial Intelligence in Network Services

7.1 Intelligent Routing and Traffic Control

Artificial intelligence technology can be used for intelligent routing and traffic control. By analyzing network traffic in real time and dynamically adjusting routing strategies, the network's transmission efficiency and service quality can be improved.

7.2 Speech Recognition and Natural Language Processing

Speech recognition and natural language processing are important application areas of artificial intelligence. By integrating speech recognition and natural language processing technologies into network services, functions such as intelligent customer service and voice assistants can be realized to improve user experience.

7.3 Personalized Recommendation and Service Optimization

Artificial intelligence technology can provide personalized recommendation services and improve user satisfaction by analyzing user behavior and preferences. In network services, artificial intelligence can optimize content distribution strategies and improve service quality.

8. Challenges and Future Development of Artificial Intelligence in Network Technology

8.1 Data Privacy and Security Issues

While processing and analyzing large amounts of data, artificial intelligence technology also brings data privacy and security issues. How to give full play to the advantages of artificial intelligence while protecting user privacy is an important research direction.

8.2 Computing Resources and Energy Efficiency Issues

The requirements of artificial intelligence technology for computing resources and energy efficiency are particularly important. With the increase in application scenarios, how to improve the utilization efficiency of computing resources and reduce power consumption is an urgent problem to be solved.

8.3 Technical Standards and Laws and Regulations

The development of artificial intelligence technology requires the support of corresponding technical standards and laws and regulations. The formulation of unified technical standards and laws and regulations can regulate the application of artificial intelligence technology and promote its healthy development.

8.4 Future Development Trends

In the future, artificial intelligence technology will play a more important role in computer network technology. With the continuous advancement of technology, artificial intelligence will be more widely and deeply applied in the fields of network security, network management, Internet of Things, edge computing, network services, etc.

9. Conclusion

This paper analyzes the application of artificial intelligence in computer network technology and explores its specific applications and effects in network security, network management, Internet of Things, edge computing, network services, etc. The introduction of artificial intelligence technology has improved the standardization level and operation efficiency of the network, but also brought challenges in data privacy, security and computing resources. In the future, with the continuous advancement of technology, artificial intelligence will play a more important role in computer network

technology and provide strong support for the development of the information society.

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