





Artificial Intelligence Research in Computer Network Technology

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Abstract. The development of AI has witnessed significant advancements over the years; from rule-based systems to deep neural networks, AI has become more sophisticated in understanding and processing data. This progress has paved the way for various applications across different fields in the national economy. All the countries create new requirements simultaneously for developing high-tech technology due to the country's ongoing economic growth. The concept of "artificial intelligence" emerged in light of this social setting. Artificial Intelligence has improved our environment, changed our lives in ways never seen before, and made using computer networks more convenient. The demands of the general public are also continually evolving, and individuals are starting to look for a better quality of life. Computer network technology is a type of high-tech, novel technology that has slowly crept into our daily lives and evolved into a sophisticated industry in the modern period. It has also significantly impacted computer network technology, offering a fresh path for innovation and advancement. It discusses artificial Intelligence and analyzes its application in classification and identification services, network security, and computer network management for future research into the creation and use of AI in computer network technology. Artificial Intelligence can effectively address the issue and propose solutions following the relevant data issues, allowing for fast handling of all types of data information. This essay explores the use and importance of Artificial Intelligence in big data, focusing on how it is applied in computer networks.

Keywords: Security · Application of Artificial Intelligence · Computer Network System Management · network monitoring · network security · network optimization · predictive maintenance

1 Introduction

The Dartmouth Society's first proposal for the word "Artificial Intelligence (AI)" was in 1956. Artificial Intelligence mainly refers to the Intelligence exhibited by human-made robots that can observe, mimic, and evaluate human behavior [1]. AI is a field of computer science that seeks to comprehend the nature of Intelligence and build a machine with Intelligence that functions similarly to humans. Computers are currently a significant tool for researching the advancement of Artificial Intelligence.

AI's main problems are planning, learning, communication, tool use, and creating knowledge comparable to or even more significant than human understanding. As the economic status of every nation has improved, computer network technology has also become increasingly prevalent in daily life. Artificial Intelligence refers to the machine that academics think will be able to perform the complex and hazardous tasks that people perform with robots. This machine can both fast increase productivity and safeguard people's interests. The primary abilities of Artificial Intelligence are strong reasoning, language communication, operation, and recognition; these abilities are also continuously evolving in tandem with the advancement of technology.

Artificial Intelligence in computer network technology, a recent innovation in society, also improves people's quality of life. Its goal is to mimic human thought processes, behavior, and Intelligence to assist individuals in completing more laborious, repetitive tasks or more challenging, high-precision jobs [2].

Financial data computing, for instance, uses artificial intelligence technology to compute financial data correctly and efficiently. This helps financial staff by reducing their workload significantly. Artificial intelligence technology is becoming increasingly prevalent in computer networks, where it plays a critical role. It has garnered significant attention from people from all walks of life and is crucial in many facets of life by advancing social education.

Artificial Intelligence can effectively address this issue and propose solutions following the relevant data issues, allowing for fast handling of all types of data information. This essay explores the use and importance of Artificial Intelligence, focusing on how it is applied in computer networks [3].

Artificial Intelligence based on big data has made life much more accessible for people thanks to the in-depth development of computers. This technology not only speeds up the distribution of information in contemporary society but also offers crucial support for the steady growth of society. The foundation of artificial intelligence vision is information and communication technologies—the data processing method in the modern information age.

2 Concept of AI and Computer Network Technology

The terms "artificial" and "intelligence" can be used to separate the definition of artificial Intelligence. It is easier to understand "artificial" since it refers to an artificial system in the traditional sense. The term "intelligence" has many definitions, but "research human intelligent activities" is the more widely accepted definition in the field. This definition encompasses concepts like consciousness, the self, and thinking. Artificial Intelligence

is a new technology for technical science research, simulation development, and extension of human intelligence theory, methods, and application systems. It is a subfield of computer science, sometimes called mechanical Intelligence. By enabling computers to mimic human audio-visual speech, specific thought processes, and intelligent behaviors, artificial Intelligence aims to Put it another way by incorporating knowledge about people's consciousness and thought processes into a machine; it is possible to imbue it with human wisdom and replace humans in high-risk, challenging, and complex tasks.

Almost all natural and social science fields, whose purview lies outside computer science, can be said to have this characteristic. Thinking science and artificial Intelligence are related as practice and theory are related. Thinking science applies technology, and Artificial Intelligence is a subset of that application. The advancement of artificial Intelligence is intimately related to Artificial Intelligence. It will immediately benefit from the route that computer network technology takes in its growth. Artificial Intelligence will also enable computers to move beyond basic digital processing to knowledge processing. It has been entirely changed by computer network technology. Networks run and maintain network security and optimization due to machine learning algorithms and data analytics developments.

This section will examine how AI changes computer networks and the range of applications it enables, including improved network security and intelligent routing algorithms. Artificial Intelligence (AI) has become a revolutionary idea within the quickly developing field of computer network technology [4, 10].

3 Applications of AI in CNT

Artificial Intelligence (AI) has transformed computer network system management like many other businesses. This part will examine the many AI applications for managing computer network systems.

3.1 Real-Time Network Traffic Monitoring

Anomaly detection and network performance analysis are all possible with AI-powered solutions. These technologies use Machine learning algorithms to identify trends and anticipate future problems before they arise. In order to spot trends and provide proactive recommendations for improving network performance, they can also study past data.

3.2 Security Management

Advanced security measures in computer networks are necessary due to the complexity of cyber threats. AI can significantly improve security management by identifying and thwarting prospective intrusions. AI systems can analyze network traffic.

3.3 Network Optimization

AI algorithms can improve load balancing, among other network characteristics. AI systems ensure the best possible use of resources by dynamically modifying these settings while continuously evaluating network performance.

3.4 Network Capacity Planning

AI can help with capacity planning by examining previous network usage and trends data. Future network demands can be predicted, allowing businesses to deploy resources wisely and prevent bottlenecks.

3.5 Virtual Assistant for Network Management

AI-powered virtual assistants are gaining popularity for effectively managing computer networks. These assistants give users up-to-the-minute gadget status updates, solve typical problems, and perform ordinary tasks in response to user inputs or predefined rules.

3.6 Intelligent Routing

By dynamically altering routing patterns based on real-time situations such as congestion or link failures, AI-based routing algorithms can improve data flow within a computer network. This enhances everything.

3.7 Predictive Maintenance

AI systems can forecast upcoming hardware or software issues using data from various sources inside a computer network. AI systems can predict problems before they substantially impact by monitoring key performance indicators (KPIs), including CPU usage, memory utilization, and disk space availability.

3.8 Network Automation

AI makes it possible to automate the management of computer networks, lowering the need for manual intervention and boosting productivity. Tools with AI capabilities can automate processes like device provisioning, configuration management, and troubleshooting [4].

4 Developing an AI Framework

Information Technology cannot meet today's demanding network requirements without the proper AI strategy. The following are some technological components that every AI strategy ought to have.

4.1 Artificial Intelligence for Networking

The virtual network assistant in artificial Intelligence for networking may operate in a wireless environment as a virtual wireless expert who assists in resolving challenging issues. Imagine a virtual network assistant that uses domain knowledge, high-quality data, and syntax to deliver actionable insights on resolving current problems and predictive advice on preventing future ones.

5 Advancement of AI on CNT in the Big Data Era

5.1 AI Contributes to Computer System Security

Firewalls are the primary example of artificial Intelligence in computer network security. According to the current state of computer security technology, AI firewall security is superior to and more effective than firewall security provided by computer network technology [5, 9]. In order to protect the security of the computer system and streamline the processing of a variety of big data information, the artificial intelligence firewall also has discrimination technology to analyze and filter different data information.

5.2 AI Management's Function in Computer Networks

The artificial intelligence agent, a piece of physical software, uses artificial Intelligence to gather, examine, and process all kinds of data and information. It also relies on its knowledge base for scientific classification. Artificial software, such as an agent, can only comprise knowledge and databases under certain conditions. AI agent management can transfer data to a computer's designated location based on the needs, make it easier for users to search and search, and offer more intelligent management services [6, 7].

The computer network management system should further support the growth and advancement of telecom and artificial intelligence technology to realize artificial Intelligence against the backdrop of big data [8, 10]. Intelligent technology can lessen the complexity of managing the entire network [3, 11]. As a result, in such a setting, it can actively and effectively enhance the overall network's effectiveness and quality, strengthening network intelligent management [12–14].

6 Conclusion and Future Study

The fundamental ideas and uses of AI are presented in this paper. Technology with Artificial Intelligence is demonstrating its benefits and is crucial to human advancement. Artificial intelligence technology is expected to grow progressively over a wide range of undeveloped industries. People's lives now involve artificial Intelligence in every way. More chances and innovation for the advancement of computer network technology are made possible by the broad development and use of AI technology in numerous industries.

Artificial Intelligence has presented computer network technology with previously unheard-of difficulties and obstacles; therefore, it must continuously increase its capacity for innovation. The only way to advance computer network technology and social science and technology is to utilize artificial Intelligence effectively. To put it succinctly, as global science and technology continue to advance, so too does artificial intelligence technology, whose range of applications in daily life and industry is growing and which contributes significantly to the advancement of computer network technology that makes it possible for diverse fields to naturally combine and create continually improved applied technology, which enhances computer network security and improves user experience. Since the development of AI, individuals have had access to more critical and practical

knowledge. It can only benefit the sustainable growth of human output by fully utilizing AI technology to unlock the potential of big data and elevate human social productivity to unprecedented heights.

As a result, researching how computer networks are used in artificial Intelligence allows us to investigate the wide range of potential applications for artificial technology in the future. New technology plays a significant and direct role in advancing the advancement of human society. AI technology is crucial for research because it will be a substantial auxiliary value in future developments. However, it is equally important to remember that technology is limited in its capabilities. It must establish acceptable principles and work to ensure that it develops safely and effectively to guarantee its development. Artificial Intelligence is a cutting-edge computer technology that advances society. Artificial intelligence technology can improve people's lifestyles and quality of life while advancing science and technology. In order to better support the development of human society, recognize the benefits of and use it to optimize the processing of all types of network information.

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