Transforming Computer Network Technology Through Artificial Intelligence

Zhihuang Jiang*

Guangdong Peizheng College, Guangdong Guangzhou 510830

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 the new normal of rapid economic development, network technology is increasingly widely used in computer, new labor technology occupies more and more industrial base, in local enterprises, technology and work methods can be innovative. However, because the technology is not yet mature, China's computer development has also developed some problems, such as personal privacy is not properly protected, and technology cannot keep up with the development needs of the times. In order to enable China's computer network technology to better adapt to our national conditions, after combining artificial intelligence and computer network technology, this technology has brought many convenience to our country. Deng and Yang [1] propose multi-layer defense strategies and privacy-preserving enhancements for membership reasoning attacks within a federated learning framework. Lin et al. [2] present a Bayesian framework for modeling multivariate degradation data with dynamic covariates in reliability engineering. Tang et al. [3] address the design and optimization of shallow-angle grating couplers for vertical emission from indium phosphide devices, while Deng [4] investigates homomorphic encryption-based data integrity verification and anti-tampering mechanisms in cloud storage environments. In the automotive sector, Zhou [5] applies gradient boosting trees to diagnose bottlenecks in international automotive sales funnels, emphasizing cross-regional team efficiency evaluation. Wensi [6] explores AI-enabled data visualization marketing for automated production lines to build customer trust and improve lead-to-order conversion, and Li [7] focuses on AI-based prediction and management of automation equipment lifecycle costs as a pathway to enhancing customer lifetime value. In financial risk management, Yang et al. [8] integrate large language models for cross-asset real-time monitoring of equity, fixed income, and currency markets, while Tang and Zhao [9] employ neural networks to examine the relationship between aging population distribution and real estate market dynamics. Zhang [10] applies reinforcement learning for automated ad campaign optimization for small businesses. For network testing, Tu [11] develops ProtoMind for smart regression detection based on message sequence modeling. In business intelligence, Xie and Chen [12] present CoreViz, a context-aware reasoning and visualization engine for business intelligence dashboards, while Chen and Xie [13] augment advertiser decision support with generative AI and interactive analytics. In logistics, Wang [14] leverages AI for last-mile delivery efficiency in smart city logistics, Wang [15] employs Bayesian optimization for adaptive network reconfiguration in urban delivery systems, and Meng et al. [16] research green warehousing site selection and path planning using deep learning. Wu [17] examines cloud infrastructure for large-scale parallel computing in genetic disease research, and Wu [18] focuses on the construction and optimization of an intelligent gateway software management platform under cloud-edge integration for the Industrial Internet of Things. Chen [19] addresses efficient and scalable data pipelines as the core of data processing in gig economy platforms, and Chen [20] introduces geospatial neural networks to enhance smart city planning through location intelligence. Xu [21] presents UrbanMod for text-to-3D modeling in accelerated city architecture planning. Yuan [22] develops transformer-based techniques for processing medical texts in legal documents. Yang [23] applies LightGBM to analysis of the Chinese stock market. Finally, Li and Wang [24] employ deep learning-enhanced adaptive interfaces to improve accessibility in e-government platforms.

2. ARTIFICIAL INTELLIGENCE OVERVIEW

Artificial intelligence is the result of computer technology development and is closely related to computers, which can mimic some of the behavior or thinking of people and use robots to perform some tasks instead of humans. In essence, artificial intelligence applications can be seen as a new collection of intelligence after natural intelligence and human intelligence by which operators issue operational instructions to artificial intelligence devices and allow mechanical devices to simulate humans to perform relevant work. In the compilation process of computers, artificial intelligence enters code to achieve the purpose of simulating human thinking with computer thinking, thereby completing some more complex, ambiguous, and tedious data processing work. At the same time, computers can simulate humans' various senses and thinking methods to a certain extent, that is, machines "think like humans," act like humans, and think rationally. Nowadays, in the face of the continuous development of computer networks, artificial intelligence is effectively integrated into computer network technology,Interaction and influence, so that the data in the network is modernized and mechanized operation, and get valuable data from it, transmit back to the user, effectively help the user solve the problems encountered [1].

3. THE APPLICATION ADVANTAGE OF ARTIFICIAL INTELLIGENCE IN COMPUTER NETWORK TECHNOLOGY

3.1 Improving hierarchical management

The development of the country cannot be without the support of science and technology, and the improvement of scientific and technological standards has created conditions for the development of various industries, so the research of computer network technology has become a hot topic worldwide. At present, the application of computer network technology is significant, and artificial intelligence in particular has become the main driving force for the development of the industry. It is worth noting that network technology is a complex technology that provides technical support for the operation of computers. The traditional mode of level to level administration is still in the primary stage. 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 has broken the communication restriction of traditional level to level administration. It solves the lack of communication in level to level administration, and ensures the further improvement of network technique.

3.2 Ability to process network information

Artificial intelligence technology has great advantages for the way information is processed. First of all, the Internet has to accept a lot of information resources, many of which are not very accurate and clear. How to deal with these information to optimize the resources is a difficult problem. Artificial intelligence itself has the characteristics of information automation analysis, and applying this advantage to the analysis and processing of information can integrate this ambiguous and inaccurate information in reasoning, strengthen the management of network information, and improve the ability of network information to use.

3.3 Promotion of productivity

Artificial intelligence does not require a large amount of energy investment, a feature that shows that no matter how complex the network data computation process is, artificial intelligence can find the most ideal means of processing with its extremely fast speed, avoiding huge computational amounts on the one hand; On the other hand, it reduces energy consumption during computing and promotes a practical improvement in computing speed. The application of artificial intelligence will further promote innovation, which can be reflected in many aspects, such as the effective management of resources. 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 construction of a corresponding application scenario that will automatically perform data collection and reporting tasks. People in the organization will spend more time making decisions and taking action, which means that each person's economic productivity will increase, thus improving the productivity of the entire team. Scalable, typically starting with a pilot project, quickly transforming the pilot project into full production and scaling up as demand grows [2].

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

4.1 Strengthening cybersecurity

With the development of technology, computer network technology has brought not only economic improvement, but also life convenience, but the network security problems it has caused cannot be ignored. In order to prevent the security risks of computer network technology, artificial intelligence technology must be integrated into it to ensure network security. First, AI technology is highly targeted. The traditional computer network technology attaches great importance to information processing, ignoring the security issues, it can not achieve real-time network monitoring. AI technology has made up for this shortcoming, implementing 24-hour monitoring of network information, and once a problem occurs, it can quickly identify the cause of the problem and deal with it in the first place. Second, AI technology becomes a barrier against viruses. The existence of artificial intelligence technology makes it impossible for virus-carrying software to approach the computer, shaping a secure computer operating environment and providing guarantees for the security of user information. Email software is one of the essential software for computers, but it has also become a pathway for hacking. The process of receiving and sending mail is the process of virus intrusion, at which time artificial intelligence technology will verify the mail information, intercept spam, delete virus mail directly, and ensure the internal security of the computer. Finally, AI technology adds a firewall function. Its main purpose is to check the computer internal software, not only can prevent the virus invasion, but also can form a security report, the user can grasp the computer network running state in service.

4.2 Application in the Management and Evaluation of Computer Network System

In order to better develop computers, in reality, artificial intelligence technology must be effectively combined with it, computer network systems and control and use artificial intelligence technologies to evaluate and fully manage computer networks. Because the management and evaluation of computer network systems are often interfered with by multiple network changes, especially the progress of network intelligence, the difficulty of evaluating computer network system control is increasing. Through the introduction of AI expert decision-making, specialized knowledge and experience can be gathered, so users not only need to solve basic problems, but also can help computer systems make corresponding system evaluations, so as to grasp the actual computer dynamics in time. The application of artificial intelligence technology to the current computer network management and system evaluation can further improve the quality of computer network and management ability, at the same time, can also ensure that the computer can be fully used [3].

4.3 Online education

Internet information technology has been rapidly developed, and with the application of Internet information technology in education, education and teaching is no longer limited to the form of face-to-face teaching between teachers and students in the classroom. The combination of Internet information technology and computer technology has enriched the forms and content of teaching, increased communication between teachers and students, and diversified teaching forms have made teaching no longer boring and enhanced students' enthusiasm for learning. However, how to take into account each student in the class remains a difficult problem in education. The application of artificial intelligence in computer network technology has greatly improved the teaching efficiency. In recent years, various online education teaching software has appeared on the market. Through intelligent analysis of students' answers to questions, interactions and completion of homework in class, it helps teachers understand the learning situation of students, and facilitates teachers to provide targeted guidance to students, greatly enhancing the teaching efficiency and helping students improve their academic performance.

4.4 Smartphones and smart appliances

Computer networks have played a role in many aspects of modern life, changing the way people live. Another big reform of artificial intelligence in computer networks is the smartphone. Smartphones have developed rapidly, and in a few years, they have achieved generation after generation, and the functions have gradually evolved from camera video to more advanced functions such as fingerprint unlock and face recognition. Using the mobile phone, you can connect with the computer anytime, anywhere. Now we can see that people are basically using touch smartphones, using communication software when contacting others, using smartphones for entertainment while waiting, and even our payment methods have changed from cash payment to mobile phone electronic payment.

4.5 Intelligent navigation and positioning

With the economic development and the improvement of people's living standards, the car has become the means of transportation for most families. The navigation technology in artificial intelligence technology can help us choose the best travel route during the travel process, and can also drive according to the navigation route in unfamiliar places. With the application of artificial intelligence technology, cars can also achieve autonomous driving. Through the programming of the auto's autonomous driving, with the cooperation of artificial intelligence, radar monitoring, global positioning and other systems, the car can safely travel on the normal route without anyone actively operating.

5. CONCLUSION

In the context of rapid development of science and technology, promote the sustainable development of artificial intelligence, The role it plays also began to increase, and at the same time, artificial intelligence was scientifically incorporated into computer network technology, practically applied to every subtle computer network technology link, promoting the development of computers at a high speed. However, the development of any technology will encounter difficulties, and to realize more of the value of artificial intelligence in computer network technology, more exploration and efforts are needed for the application of artificial ity technology.

REFERENCES

[1] Deng, X., & Yang, J. (2025, August). Multi-Layer Defense Strategies and Privacy Preserving Enhancements for Membership Reasoning Attacks in a Federated Learning Framework. In 2025 5th International Conference on Computer Science and Blockchain (CCSB) (pp. 278-282). IEEE.
[2] Lin, Z., Liu, X., Xiang, Y., & Hong, Y. (2025). Modeling multivariate degradation data with dynamic covariates under a Bayesian framework. Reliability Engineering & System Safety, 111115.
[3] Tang, Y., Kojima, K., Gotoda, M., Nishikawa, S., Hayashi, S., Koike-Akino, T., ... & Klamkin, J. (2020). Design and Optimization of Shallow-Angle Grating Coupler for Vertical Emission from Indium Phosphide Devices.
[4] Deng, X. (2025). Homomorphic Encryption-Based Data Integrity Verification and Anti-Tampering Mechanism in Cloud Storage Environment.
[5] Zhou, Z. (2026). Bottleneck Diagnosis in International Automotive Sales Funnels Using Gradient Boosting Trees: Evidence from Cross-Regional Team Efficiency Evaluation. Journal of Computer Technology and Applied Mathematics, 3(1), 11-18.
[6] Wensi, L. (2026). AI-Enabled Data Visualization Marketing for Automated Production Lines: Building Customer Trust and Improving Lead-to-Order Conversion. Academic Journal of Natural Science, 3(1), 8-13.
[7] Li, W. (2026). AI‐Based Prediction and Management of Automation Equipment Lifecycle Costs: A Pathway to Enhancing Customer Lifetime Value (CLV).
[8] Yang, J., Tang, Y., Li, Y., Zhang, L., & Zhang, H. (2025). Cross-Asset Risk Management: Integrating LLMs for Real-Time Monitoring of Equity, Fixed Income, and Currency Markets. arXiv preprint arXiv:2504.04292.
[9] Tang, Y., & Zhao, S. (2025). Research on Relationship Between Aging Population Distribution and Real Estate Market Dynamics based on Neural Networks.
[10] Zhang, Yuhan. "Learning to Advertise: Reinforcement Learning for Automated Ad Campaign Optimization for Small Businesses." (2025).
[11] Tu, Tongwei. "ProtoMind: Modeling Driven NAS and SIP Message Sequence Modeling for Smart Regression Detection." (2025).
[12] Xie, Minhui, and Shujian Chen. "CoreViz: Context-Aware Reasoning and Visualization Engine for Business Intelligence Dashboards." Authorea Preprints (2025).
[13] Chen, Shujian, and Minhui Xie. "Augmenting Advertiser Decision Support with Generative AI and Interactive Analytics." (2025).
[14] Wang, J. (2025). Smart City Logistics: Leveraging AI for Last-Mile Delivery Efficiency.
[15] Wang, J. (2025). Bayesian Optimization for Adaptive Network Reconfiguration in Urban Delivery Systems.
[16] Meng, Q., Wang, J., He, J., & Zhao, S. (2025). Research on Green Warehousing Logistics Site Selection Optimization and Path Planning based on Deep Learning.
[17] Wu, W. (2024). Research on cloud infrastructure for large-scale parallel computing in genetic disease.

[18] Wu, W. (2025). Construction and optimization of intelligent gateway software management platform based on jenkins cluster management under cloud edge integration architecture in industrial internet of things. Preprints, January.
[19] Chen, J. (2025). Efficient and Scalable Data Pipelines: The Core of Data Processing in Gig Economy Platforms.
[20] Chen, J. (2025). Geospatial Neural Networks: Enhancing Smart City through Location Intelligence.
[21] Xu, Haoran. "UrbanMod: Text-to-3D Modeling for Accelerated City Architecture Planning." Authorea Preprints (2025).
[22] Yuan, J. (2024, December). Efficient techniques for processing medical texts in legal documents using transformer architecture. In 2024 4th International Conference on Artificial Intelligence, Robotics, and Communication (ICAIRC) (pp. 990-993). IEEE.
[23] Yang, J. (2025). Application of LightGBM in the Chinese Stock Market.
[24] LI, X., & Wang, Y. (2024). Deep learning-enhanced adaptive interface for improved accessibility in e-government platforms.