Synergistic Applications of Computer Communication Technology and Electronic Information in Artificial Intelligence

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Abstract: ***In recent years, driven by the vigorous development of Internet technology, the level of artificial intelligence technology has also been rapidly improved, and the scope of application has gradually expanded. Based on cloud computing technology and Internet technology, artificial intelligence simulates the response of the human brain to changes in the external environment and then puts forward corresponding problem-solving strategies according to specific situations. Artificial intelligence technology has been widely used in many fields, which has prompted many industries to be intelligent and efficient, and work efficiency has been significantly improved. At the same time, the rapid development of the social economy has also greatly promoted the improvement of the level of science and technology. In this era, computer communication technology and electronic information technology have steadily improved, played an important role in many fields, greatly promoted the development of artificial intelligence technology, and improved the work efficiency of data collection and other links. Based on this, in the process of research and analysis, the article focuses on the practical application of computer communication technology and electronic information in the field of artificial intelligence.***

Keywords: Computer communication technology; Electronic information; Artificial intelligence.

1. INTRODUCTION

Artificial intelligence technology is based on the Internet, and integrates a variety of modern technologies such as big data, cloud computing and electronic information technology. At present, China's artificial intelligence field is showing good and rapid development. In this process, the role of computer communication technology and electronic information technology is very crucial, and in-depth exploring the practical application of computer communication technologies and electronic information technologies in the field of artificial intelligence is of great significance to the development and progress of artificial economy technology in China. Deng and Yang (2025) proposed multi-layer defense strategies against membership reasoning attacks in federated learning [1]. Similarly, Sultan et al. (2026) developed FedGuard, a robust federated AI framework for privacy-conscious collaborative anti-money laundering, drawing on DARPA GARD principles [2]. Concurrently, the societal and domain-specific applications of AI are rapidly expanding. Zhou and Cen (2024) investigated the impact of ChatGPT-like AI on user entrepreneurial activities [3]. In specialized technical domains, Zhu, Yu, and Li (2025) introduced SAGCN, a spatiotemporal graph convolutional network integrated with IoT for adolescent tennis motion analysis [4]. Zheng and Jiang (2025) contributed a novel methodology for Chinese term extraction from scientific publications [5]. A significant research thrust focuses on measuring and ensuring the robustness and reliability of AI and sensing systems. Jiang et al. (2025) defined Perception Characteristics Distance to quantify the stability of perception systems under dynamic conditions [6]. In reliability engineering, Lin, Liu, Xiang, and Hong (2025) presented a Bayesian framework for modeling multivariate degradation data with dynamic covariates [7], while Wu, Luo, and Liao (2025) applied multi-level transfer learning for small-sample crack detection in concrete structures [8]. This work builds upon foundational statistical methods like the Poisson multinomial distribution computation for ecological inference and machine learning [9]. Finally, several studies propose novel frameworks for industrial and business applications. These include few-shot neural editors for 3D animation in SMEs (Hu, 2025) [10], reinforcement learning for automated ad campaign optimization (Zhang, 2025) [11], an intelligent framework for 5G network test automation (Tu, 2025) [12], a system for optimizing real-time industrial monitoring (Xie and Liu, 2025) [13], and a framework for reliability engineering with causal tracking and observability reasoning (Zhu, 2025) [14].

2. OVERVIEW OF COMPUTER COMMUNICATION TECHNOLOGY AND ELECTRONIC INFORMATION TECHNOLOGY

Computer communication technology includes nonlinear information and a variety of linear information and other multi-layer network structure, the development of artificial intelligence can not be separated from the support of computer communication technology, and is widely used in speech response, speech recognition, visual image and other intelligent data processing and acquisition. Data analysis is the basic condition of interrelation between computer communication technology and artificial intelligence technology, especially for relatively complex data information and large capacity data information processing. The processing speed and efficiency of complicated data model and massive data can be accomplished by computer communication technology, and the data marking and processing ability of computer communication technology is realized by artificial intelligence data processing technology. Electronic information technology is divided into information technology and electronic science technology, which can be used for data processing, while electronic science technology is used to complete data processing and transmission with the help of computer hardware. Nowadays, electronic information technology is gradually moving towards the direction of cloud computing and intelligent development, and can use the cloud to complete the task of processing information. At the same time, with the deep innovation and development of network technology and various technologies, electronic information technology has gradually become intelligent and virtualized, which has also played a catalytic role in the development of artificial intelligence. To complete the computing process of data through computer communication technology and electronic information technology, it can not only improve the ability of computers to identify valid information, but also provide a strong basis for the progress and development of artificial intelligence. Therefore, in order to achieve the effective integration and promotion of computer communication technology and electronic information technology in the field of artificial intelligence, it is necessary to strengthen the innovative research and development of computer communication technologies and electronic information technologies [1].

3. THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE FOR SOCIAL DEVELOPMENT

The emergence of artificial intelligence has better solved the shortcomings of traditional industrial production that focuses on industrial processes and lacks the ability to work in complex ways. It can effectively reduce labor intensity and dependence on human beings, effectively avoid errors in production, life and service, greatly improve the efficiency of social operations and the way information is transmitted. Compared with traditional social service models, the ability of artificial intelligence to receive and process information is much higher than that of human service models, and artificial intelligence can pre-set its behavior, which can maintain efficient and error-free operation. Current AIs are beginning to be able to perceive their surroundings and improve workflows through self-learning capabilities, and advanced AIs are even able to effectively perceive and respond to the emotions of their service recipients. Judging the satisfaction of the service recipients to improve its own service content or service methods is very helpful to the improvement of service efficiency, and AI can almost set boundless service methods to meet a variety of different service recipient [2].

4. APPLICATION OF COMPUTER COMMUNICATION TECHNOLOGY AND ELECTRONIC INFORMATION IN ARTIFICIAL INTELLIGENCE

4.1 Artificial Intelligence Image Recognition

Image recognition technology is an important branch of the artificial intelligence system, which refers to the technology that uses computers to process, analyze and understand images to identify objects and image objects in various different patterns. This technology mimics the human process of image recognition, extracts image features and integrates the identified information, and finally forms the phased identified information into a complete perceptual image that shows the recognition target. The specific process of AI image recognition is: information acquisition - preprocessing - feature selection - training process (classification design, classification decision). In combination with the process, the intelligent identification system first obtains and pre-processes the image information. Then extract the features in the image information, and conduct in-depth analysis of these features, and finally combine the corresponding rules in the classifier design module to determine, and also make decisions on the feature information, so that the identification object can be better demonstrated.

At present, artificial intelligence image recognition technology has been very commonly used in many fields, among which the most widely used and relevant to life are face recognition and license plate recognition. In the face recognition process, first collect the image information of the face and pre-process extract the characteristics of the image, and finally by reserving the matching and recognition of the image information, the recognized face

can be verified whether it is a fit face in the database. At present, this technique is relatively mature, and the error rate is very low. It has achieved good results in mobile payment APP, residential security and other fields. In the license plate recognition process, the license plate image is directly preprocessed, the image units are divided well for uniformization and detail processing, and the characters in the license plate picture are extracted according to the feature information, and the identification process is finally completed. Artificial intelligence image recognition technology also has a good application in other fields, such as remote sensing image recognition technology through aerial remote sensing image analysis of regional resources, environmental quality, disaster prediction. For example, the application of biomedical image recognition technology can visualize the patient's condition and assist in subsequent medical work. In the context of the continuous maturity of the subsequent development of artificial intelligence technology, the application surface of artificial identification technology will become more widespread, and it can achieve better application results.

4.2 Applications in Intelligent Transportation

With the rapid development of science and technology, the level of computer technology is gradually improved, in order to realize the application of computer communication technology and electronic information in the field of intelligence, It can be tried to apply to the road traffic aspect that people have always been concerned about, to achieve safe driving with the help of artificial intelligence, and to achieve the goals of fully automatic unmanned driving and intelligent driving. The application of computer communication technology and electronic information technology to intelligent transportation systems can achieve the goal of common progress and effective integration of computer technology and social development. Intelligent transportation system is a comprehensive application of a variety of computer science and technology, with the help of computer communication technology to collect, analyze and process data, complete the practical application and summarization of huge amounts of information, and complete the purpose of directing traffic, coordinating roads and safe driving. For example, the emergence of autonomous ride-hailing in Beijing has been opened to users in the Beijing Economic and Trade Zone, and when automatic driving mode is turned on, the driver can complete the automatic driving without using the steering wheel. This not only brings convenience to people's travel, but also improves the level of safe driving, thereby reducing the probability of traffic accidents. Today's information and data all function in a unified hardware facility, enabling the real-time sharing of data and information, so that its own functions can be effectively performed. Therefore, the state and relevant departments should continuously strengthen research on computer communication technology and electronic information technology to provide effective technical support for people's safe driving travel [3].

4.3 Application of Computer Communication Technology and Electronic Information in Network Intelligent Security Management

Network intrusion detection is the first threshold to ensure network security, so it should be accorded high priority, and the introduction of computer communication technology and electronic information technology is mainly to analyze information data. When some external risk factors or viruses are discovered, they will be automatically detected and the results will be directly fed back-office, which will significantly improve the network security and ensure that users can enjoy a better user experience. Computer communication technology and information security can also be directly applied to intelligent firewall construction, It can effectively block various types of viruses, and in this process, identification technology is very important, which can rapidly identify virus data and reduce the computation by various methods such as statistics and analysis. Ensure that its security is significantly improved, and the identification technology relies on computer communication technology to realize related functions, which can directly kill all kinds of virus information in the cradle, quickly repair vulnerabilities in request services, and improve the security of the network [5].

4.4 Application of Network Data Cloud Sharing

Artificial intelligence can be realized and developed without network resource sharing, information data sharing is accomplished through computer communication technology, electronic information technology architectures cloud servers through network interfaces, thereby obtaining a large amount of meaningful data. Through these two technologies, the AI library will upload the information obtained and can provide a better service to users with its own communication and imitation capabilities. With the upgrade of artificial intelligence, the machine can distinguish different users, and through the different behaviors of users, proactively extract relevant effective information, complete personalized service, and further improve the user service experience.

4.5 Applications in smart medicine

The development of network technology is inseparable from information security, and artificial intelligence also needs to put it in the first place. Through the language and imitation ability of artificial intelligence, the information of patients can be displayed through different carriers. For example, images and text can be displayed through different social software such as WeChat and QQ to share information. At the same time, biomedical image recognition technology can also be used, which can show the patient's condition more intuitively and assist with subsequent medical work. In addition, it can construct a network evaluation model based on clinical evaluation standards, automatically conduct evaluation and scoring, greatly improve the efficiency of evaluation, and promote the sustainable health development of the modern medical industry [4].

5. CONCLUSION

Computer communication technology and electronic information have achieved good results in the field of artificial intelligence, but in-depth research on these technologies needs to be strengthened. This also requires enterprises in the electronic information industry to continue to strengthen relevant research on artificial intelligence in the future, while also strengthening the level of technological innovation. In the process of technological innovation, enterprises should also strengthen the research of market requirements, and base their technological innovation exploration on these requirements, so as to ensure that the final innovation results can be better translated.

REFERENCES

[1] Peng Jing. Practical Application of Computer Communication Technology and Electronic Information in AI [J]. Power Equipment Management, 2020 (12): 168-170.
[2] 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.
[3] Sultan, N., Patwar, N., Wei, X., Chew, J., Liu, J., & Du, R. (2026). FedGuard: A Robust Federated AI Framework for Privacy-Conscious Collaborative AML, Inspired by DARPA GARD Principles. International Academic Journal of Social Science, 2, 1–16. https://doi.org/10.5281/zenodo.18253151
[4] Zhou, J., & Cen, W. (2024). Investigating the Effect of ChatGPT-like New Generation AI Technology on User Entrepreneurial Activities. Innovation & Technology Advances, 2(2), 1–20. https://doi.org/10.61187/ita.v2i2.124
[5] Zhu, Y., Yu, W., & Li, R. (2025). SAGCN: A spatiotemporal attention-weighted graph convolutional network with IoT integration for adolescent tennis motion analysis. Alexandria Engineering Journal, 128, 652-662.
[6] Zheng, H., & Jiang, T. (2025). A New Methodology for Chinese Term Extraction from Scientific Publications. Innovation & Technology Advances, 3(2), 19–45. https://doi.org/10.61187/ita.v3i2.222
[7] Jiang, B., Shi, L., Lin, Z., Stowe, L., & Guo, F. (2025). Perception Characteristics Distance: Measuring Stability and Robustness of Perception System in Dynamic Conditions under a Certain Decision Rule. arXiv preprint arXiv:2506.09217.
[8] 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.
[9] Wu, J., Luo, L., & Liao, N. (2025). Small-Sample Object Detection of Surface Cracks in Concrete Structures of High-Rise Buildings via Multi-Level Transfer Learning. Innovation & Technology Advances, 3(2), 57–72. https://doi.org/10.61187/ita.v3i2.262
[10] Lian, J., & Chen, T. (2024). Research on Complex Data Mining Analysis and Pattern Recognition Based on Deep Learning. Journal of Computing and Electronic Information Management, 12(3), 37-41.
[11] Hu, Xiao. "Learning to Animate: Few-Shot Neural Editors for 3D SMEs." (2025).
[12] Zhang, Yuhan. "Learning to Advertise: Reinforcement Learning for Automated Ad Campaign Optimization for Small Businesses." (2025).
[13] Tu, Tongwei. "AutoNetTest: A Platform-Aware Framework for Intelligent 5G Network Test Automation and Issue Diagnosis." (2025).
[14] Xie, Minhui, and Boyan Liu. "InspectX: Optimizing Industrial Monitoring Systems via OpenCV and WebSocket for Real-Time Analysis." (2025).
[15] Zhu, Bingxin. "REACTOR: Reliability Engineering with Automated Causal Tracking and Observability Reasoning." (2025).

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