Application and Development of Computer Science and Technology in the Era of Artificial Intelligence

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Abstract: *With the continuous progress and development of the times, computer technology is becoming more and more mature and the corresponding computers are also applied to the production and business activities of all walks of life. As an emerging technology, artificial intelligence has comprehensively promoted the rapid development of all walks of life. The effective integration of artificial intelligence technology in the computer field can realize the mutual promotion and common development of the two and also drive the rapid development of all walks of life. These are challenges to society, ethics, science and technology, morality, and other aspects in the era of artificial intelligence.*

Keywords: Artificial intelligence; Computer science; Technology application.

1. INTRODUCTION

In the continuous development of the social economy, artificial intelligence has become the focus of industry attention. Applying it to computer science can not only promote industrial upgrading, but also fully meet the quality development needs of the industry and gradually enhance its competitiveness. However, due to the particularity of computer science, issues such as network security and illegal activities are often encountered in the application of technology. These phenomena can to some extent affect the technological innovation of artificial intelligence and prevent the sustainable development of the industry. Therefore, in the context of artificial intelligence, in order to achieve innovation in computer science and technology, it is necessary to refine the application strategies of artificial intelligence in computer networks based on the operating conditions of the times, fully demonstrate technological advantages, and achieve the goal of sustainable operation and steady development of the industry. Recent advancements in machine learning and deep learning have significantly impacted various domains, including finance, healthcare, urban development, and environmental sustainability. In the financial sector, Deng et al. (2025) proposed a transformer-based model for real-time financial fraud detection, optimized for cloud-based streaming, demonstrating improved efficiency in identifying fraudulent activities [1]. Similarly, in healthcare, Diao et al. (2025) optimized Bi-LSTM networks to enhance lung cancer detection accuracy, showcasing the potential of deep learning in medical diagnostics [5]. Urban sustainability has also benefited from these technologies, as Zhou et al. (2024) developed an automated garbage recognition model using ResNet-50 and weakly supervised CNN, contributing to efficient waste management in smart cities [4]. In the realm of green innovation, Chen et al. (2025) explored the positive effects of the digital economy on green innovation, highlighting its role in promoting sustainable economic practices [2]. Additionally, Meng et al. (2025) applied deep learning to optimize green warehousing logistics, addressing site selection and path planning challenges [3]. In the labor market, Zhao et al. (2025) utilized machine learning and the DMP model to evaluate labor market efficiency under the influence of media news, providing insights into economic dynamics [8]. Furthermore, Wu (2025) focused on fault detection and prediction in cloud infrastructure, emphasizing resource optimization [9]. In demographic studies, Tang and Zhao (2025) investigated the relationship between aging population distribution and real estate market dynamics using neural networks, offering predictive insights for urban planning [10]. In healthcare data analysis, Pang et al. (2024) leveraged electronic health records for diabetes risk prognosis, demonstrating the utility of data-driven approaches in chronic disease management [11]. Lastly, Yan et al. (2024) advanced image super-resolution reconstruction using convolutional neural networks, showcasing applications in high-performance computing and artificial intelligence [12].

2. DEFINITION OF ARTIFICIAL INTELLIGENCE

Artificial intelligence technology makes technology more intelligent through human settings, making technology use in line with human behavior patterns, and can achieve the same or even better than humans in certain aspects.

Artificial intelligence technology is a technological means that has been developed by integrating multiple aspects of knowledge. For example, by using artificial intelligence technology to input language programs, psychology, or other disciplinary knowledge into machines, machines can have multiple functions such as dialogue and problem-solving, and even imitate human behavior to achieve machine intelligence. By intelligentizing machines, work efficiency can be greatly improved and various problems can be solved, so artificial intelligence technology is widely applied to production work in many industries. The emergence of artificial intelligence technology cannot be separated from computer network technology, and the further development of computer network technology cannot be separated from artificial intelligence technology. There is a close relationship between the two.

3. THE CURRENT STATUS OF APPLICATION OF COMPUTER SCIENCE AND TECHNOLOGY

Electronic technology has reduced the manufacturing cost of computers. Electronic products such as mobile phones and tablets are gradually developing towards affordability, intelligence, and portability. Electronic products have transformed from high-end technology products to everyday electronic products. The development achievements of computer technology are benefiting thousands of households. The daily life of the public is inseparable from computers, and electronic products have become important tools for people's work, entertainment, and leisure. Students can use electronic devices to access learning materials, teachers can use electronic devices to prepare lesson plans, and travelers can use electronic devices to plan their trips.

Due to the strong portability and convenience of electronic products, people have a high acceptance of computers and are willing to accept the lifestyle changed by electronic technology. Computer science and technology have changed social development, daily life, and people's ideological concepts.

In order to meet the different needs of different stages of social development, the development trend of computer science and technology is gradually tending towards specialization and multidirectionality. Researchers have designed and developed products with unique functions based on the needs of social development. Electronic information technology has changed the way information is disseminated and collected. At present, a large amount of information is gathered on the Internet, which contains huge economic value. In order to cope with the massive amount of data information, people have to develop computer technology, continuously improve the information processing and data analysis capabilities of computers, and shorten processing time. The Internet contains a lot of information, including useless junk information and valuable user information. How to quickly filter valuable user information from the internet is a problem that modern enterprises must solve. The information advantage directly determines the vitality and competitiveness of the enterprise. Thanks to the rapid development of computer technology, intelligent management has become a common management mode for most enterprises. This management model is based on computer technology, using user characteristics as the standard to classify each user and include them in the database, thereby providing data that can be used for analysis to the computer and ultimately achieving the goal of optimizing services. Enterprises can also strengthen the matching of products and data, improve the utilization of information and resources, serve the public with technology, and make people's lives more convenient and accessible.

4. THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN COMPUTER NETWORK TECHNOLOGY

4.1 Online education and teaching

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

situation, facilitates targeted guidance for students, greatly improves teaching efficiency, and helps students improve their academic performance.

4.2 Application in Data Mining

Combining the use of computer science and technology, through the analysis of big data usage in data mining and data protection, it is possible to coordinate and manage data resources through the coordination of various system resources in data mining and resource processing, fully demonstrating the advantages of data mining and system analysis. Normally, when using a data mining system, the following should be achieved:

In the use of data mining systems, by setting up operational procedures and utilizing security mechanisms in intrusion system settings, the security management of the system can be coordinated based on its usage, and the occurrence of data security risks can be minimized to the greatest extent possible. Moreover, in the database system settings, the artificial intelligence system needs to be integrated with the human brain through the computer science security system settings. Then, by setting up a comprehensive data security system, the occurrence of virus invasion problems can be avoided. Through virus processing, information comparison, and resource matching, timely defense warnings can be issued to achieve the normal operation and correct operation of the system.

According to the operation of the virus defense system, the system is limited by its own mode in different system usage situations. Through the setting of the virus defense mechanism, shared resources will be set according to the situation of virus attacks. Then, through the study of system usage parameters, the processing plan will be refined to steadily improve the system's operation and usage efficiency. For example, in the use of AGENT technology, the protection of data resources can be strengthened through the setting of data collection and analysis schemes. Then, through the coordination of artificial intelligence operation schemes, intrusion control ranges can be set to achieve the purpose of virus defense and processing.

4.3 Application of Artificial Intelligence in Computer Neural Network Systems

The combination of computer network management and neural network management effectively integrates artificial intelligence simulation functions, which can handle many problems in network operation. Relevant technical personnel simulate the propagation and transmission of human brain thinking, and develop corresponding artificial neural network information processing systems, which can effectively process large capacity data information and also help diagnose various faults and accidents.

4.4 Application of Artificial Intelligence in Computer Vision

In the application of computer vision recognition related technologies, traditional techniques mainly focus on the analysis and processing of perceptual and dynamic content, requiring the combination of corresponding sensors to collect actual data information on site and perform data processing. The application of artificial intelligence technology in it mainly combines the efficient inspection function of information, extracts relevant points, and integrates the function of self-learning to achieve efficient recognition of things.

4.5 Application in Microsystems

In the application of computer science and technology, the integration of artificial intelligence and microsystems can be combined with device usage and system operation plans to set up an information-based system management plan. Then, through the setting of a computerized microsystem management plan, the advantages of using artificial intelligence technology can be demonstrated, gradually enhancing the competitiveness of the industry. Usually, in the integration of artificial intelligence and microsystems, the technical usage scheme is as follows:

In the setting of artificial intelligence systems, through the setting of personal service systems, the operational advantages of computer systems can be utilized to set up humanized system management solutions. Through the use of this information resource, the experience function of computer systems will gradually be improved, demonstrating the value of microsystems. For example, in the case of the comprehensive use of Python and JavaScript systems, the integration of artificial intelligence and speech systems can enable the judgment of user language and the clarification of language access mechanisms, achieving the goal of system integration and semantic coordination with the development of artificial intelligence.

With the continuous development of network information technology, device information can be updated in a timely manner through the integration of resources such as speech recognition, network, and big data in the use of operating systems. Then, through the setting of communication and exchange schemes, user experience can be improved, and the goal of integrating computer science and technology with WeChat system can be achieved, fully meeting the sustainable and efficient development needs of the industry.

4.6 Intelligent Anti spam Technology

Many important documents or notifications at work are sent through email, and in the information age, our email information is exposed when we shop online, register accounts, and perform other operations. Some businesses will send us advertisements through email, where we often receive a large number of spam emails such as invitations to apply for credit cards from a certain bank, promotional activities for certain brands, and even some WeChat businesses. These spam emails will cover some important emails, and deleting them one by one will waste a lot of our time. Artificial intelligence applications can achieve intelligent anti spam functions. Artificial intelligence anti spam technology is to comprehensively scan the information received in our email, classify the received emails through searching for sensitive vocabulary or links, facilitate our processing of these emails, protect the security of our email, and save us more email processing time.

5. CONCLUSION

In summary, in the use of network information technology, through the coordination of network information technology and the application of computer systems, a comprehensive data processing and fusion plan can be set up based on the equipment usage situation. Then, combined with the problems existing in the use of artificial intelligence technology, a computer science and technology usage plan can be constructed to gradually improve the equipment usage effect and fully meet the high-quality development needs of the industry. Therefore, in the continuous operation and innovation of the industry, it is necessary to combine the use of computer science and technology in the era of artificial intelligence, standardize the system operation plan, and then improve the standardization of system operation through the application of network security management, data mining technology, etc., to achieve the goal of sustainable operation and high-quality development of the industry.

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