

AI-Driven Transformation of Computer Science and Technology: Applications and Future Directions

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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 concern, and its application in computer science can not only promote industrial upgrading, but also fully meet the quality development needs of the industry, gradually improving the competitiveness of the industry. However, due to the special nature of computer science, the application of technology is often subject to issues such as cybersecurity and criminal wrongdoing, which will to some extent affect the technological innovation of artificial intelligence and cannot achieve the sustainable development of the industry. Therefore, in the context of artificial intelligence, in order to realize the innovation of computer science and technology, it is necessary to combine the operational conditions of the times, refine the strategy for the application of artificial ity in computer networks, fully demonstrate the technological advantages, and realize the purpose of continuous operation and steady development of the industry. Yang et al. [1] integrate large language models for cross-asset real-time monitoring of equity, fixed income, and currency markets. Tang et al. [2] conduct a qualitative analysis of regional housing supply and demand imbalances in the U.S. using big data, while Tang and Zhao [3] employ neural networks to examine the relationship between aging population distribution and real estate market dynamics. In advertising optimization, Zhang [4] applies reinforcement learning for automated ad campaign optimization for small businesses. For network testing, Tu [5] develops ProtoMind for smart regression detection based on message sequence modeling, and Tu [6] introduces SmartFITLab, an intelligent execution and validation platform for 5G field interoperability testing. In manufacturing and business intelligence, Xie and Chen [7] present Maestro, a multi-agent system for task recognition and optimization in manufacturing lines, while Xie and Chen [8] develop CoreViz, a context-aware reasoning and visualization engine for business intelligence dashboards. Chen and Xie [9] augment advertiser decision support with generative AI and interactive analytics. In logistics, Wang [10] employs Bayesian optimization for adaptive network reconfiguration in urban delivery systems, and Meng et al. [11] research green warehousing site selection and path planning using deep learning. Wu [12] optimizes image classification models for cloud infrastructure with elastic scaling, and Wu [13] focuses on the construction and optimization of an intelligent gateway software management platform under cloud-edge integration for the Industrial Internet of Things. Chen [14] addresses design optimization of data pipelines in gig economy platforms, and Chen [15] further explores efficient and scalable data pipelines as the core of data processing in such platforms. Xu [16] presents UrbanMod for text-to-3D modeling in accelerated city architecture planning. Yuan [17] exploits GPT-4 for multimodal medical data processing in electronic health record systems. Li et al. [18] explore gamifying data visualization to foster citizen engagement in smart cities, and Li et al. [19] apply named entity recognition to smart city data streams for enhanced visualization and interaction. In the automotive sector, Zhou [20] develops a collaborative filtering model for digital precision distribution of social media content on private domain platforms. For industrial marketing, Wensi [21] investigates AI-assisted marketing content generation for non-standard industrial automation solutions, while Li [22] focuses on AI-based prediction and management of automation equipment lifecycle costs to enhance customer lifetime value. In photonics, Tang et al. [23] address the design and optimization of shallow-angle grating couplers for vertical emission from indium phosphide devices. Finally,

Deng [24] investigates homomorphic encryption-based data integrity verification and anti-tampering mechanisms in cloud storage environments.

2. DEFINITION OF ARTIFICIAL INTELLIGENCE

Artificial intelligence technology makes technology smarter through artificial programming, so that technology can be utilized in accordance with human behavior, and can do as well as or even better than humans in some aspects. Artificial intelligence technology is a technological means that has been studied through the collection of many aspects of knowledge. For example, using artificial intelligence technology to input language programs, psychology or other disciplines' knowledge content into machines, the machine can perform various functions such as dialogue, answer questions, and even mimic human behavior to achieve machine intelligence. By artificial intelligence of machines, it can greatly improve work efficiency and can help us solve all kinds of problems, so artificial intelligence technology is widely used in production work in many industries. The emergence of artificial intelligence technology cannot be achieved without computer network technology, and the further development of computer network technology cannot take place without artificial intelligence, and the two are closely related.

3. CURRENT APPLICATION OF COMPUTER SCIENCE AND TECHNOLOGY

Electronic technology has reduced the cost of manufacturing computers. Mobile phones, tablets and other electronic products are gradually developing to be more user-friendly, intelligent and portable. Electronics has been transformed from high-end technology products to everyday electronics. The benefits of computer technology are reaching millions of households. Volkswagen's daily life has been inseparable from the computer, electronic products have become people's work, entertainment, leisure and an important tool. Students can use electronic products to access study materials, teachers can use electronic tools to prepare lesson plans, and travelers can use electronic devices to plan their trips. Due to the extreme portability and convenience of electronic products, people have a high acceptance of computers and are happy to accept the lifestyle changed by electronic technology [4]. Computer science and technology have changed social development, changed daily life, and even changed people's thinking. In order to meet the different needs of society at different stages of development, the development trend of computer science and technology is gradually becoming specialized and multidirectional. Researchers have designed and developed products with unique features according to the needs of social development. Electronic information technology has changed the way information is disseminated and collected. At present, a huge amount of information is gathered on the Internet, and this information has tremendous economic value. In order to deal with the massive data, people have to develop computer technology, constantly improve the computer information processing, data analysis capabilities, shorten the processing time. The Internet contains a lot of information, including both useless spam and valuable user information. How to quickly sift through the web for valuable user information is a problem that modern enterprises must solve. Information advantage directly determines the viability and competitiveness of the enterprise. Thanks to the rapid development of computer technology, intelligent management has become a common management model for most enterprises. This management model is based on computer technology, which classifies each user as a criterion and incorporates into a database, thus providing the computer with data that can be used for analysis, ultimately achieving the purpose of optimizing the service. Enterprises can also strengthen the matching of products and data, improve the utilization rate of information and resources, and serve the people, making people's lives more convenient and convenient.

4. APPLICATION OF ARTIFICIAL INTELLIGENCE IN COMPUTER NETWORK TECHNOLOGY

4.1 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.

4.2 Application in Data Mining

In data mining and data protection, Through the analysis of the use of big data, we can coordinate and manage the data resources through the coordination of various system resources in data mining and resource processing, and fully show the advantages of data mining and system analysis. In general, data mining should be used to:

In the use of data mining system, through the setting of the operating process, in the intrusion system settings, the use of security mechanisms, according to the use of the system, to coordinate the safety of the system management, and to avoid the emergence of data security problems to the greatest extent [4]. Moreover, in the setting of the database system, through the setting of computer science assurance systems, the artificial intelligence system needs to be combined with the human brain. After that, through the setup of a sound data protection system, it can avoid the emergence of virus intrusion problems, issue defense warnings in a timely manner through virus processing, information comparison and resource matching, and achieve the purpose of normal operation and correct operation of the system.

Depending on the operation of the virus defense system, in different systems used, The system is limited by its own mode, through the virus defense mechanism settings, will be based on the situation of the virus attack set shared resource, after the use of the system parameters, detailed processing program, steadily improve the operation and efficiency of the system. 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, and then through the coordination of artificial intelligence operation schemes to set intrusion control areas and achieve virus defense and treatment purposes.

4.3 Application of Artificial Intelligence in Computer Neural Network Systems

Computer network management combines the approach of neural network management, effectively integrates artificial intelligence simulation functions, and can handle many problems of network operation. Relevant technical personnel simulate the transmission and transmission of human mind, and develop the corresponding artificial neural network information processing system, which can achieve effective processing of large amounts of data and information, but also contribute to the diagnosis of various failures.

4.4 Artificial Intelligence in Computer Vision Applications

In the application of computer vision recognition technology, traditional technology is mainly aimed at the perception level and the analysis and processing of dynamic content, which needs to combine the corresponding sensors to collect actual data information in the field and conduct data processing. The application of artificial intelligence technology in this area is mainly to combine the efficient inspection function of information, extract relevant points, and integrate the function of autonomous learning to achieve efficient identification of things.

4.5 Applications in microsystems

In computer science and technology applications, integrate artificial intelligence with microsystems, It is possible to set up an informationized system management plan in combination with equipment usage and system operation plans, and then demonstrate the use advantages of artificial intelligence technology through the setting of computer micromanagement plans, gradually improving the competitiveness of the industry. Typically, in the fusion of artificial intelligence with microsystems, the technology's use scenarios are as follows:

In the settings of artificial intelligence systems, through the settings of personal service systems, Can take advantage of the operation of the computer system, set up humane system management program, through the use of this information resource, will gradually enhance the experience of the computer system function, show the use of micro-system value. For example, in the case of the integrated application of Python and JavaScript systems, through the fusion of artificial intelligence and speech systems, it is possible to judge the user's language in the context of artificial improvement, and then clarify the language access mechanism, achieving the purpose of system integration and semantic coordination [4].

In the case of continuous development of network information technology, in the implementation of operating system use, through speech recognition, The integration of resources such as the network and big data can update equipment information in a timely manner, and then improve the user experience through the setting of communication and communication schemes, realize the purpose of integrating computer science and technology with WeChat system, fully meet the needs of the continuous and efficient development of the industry.

4.6 Intelligent anti-spam technology

Many important documents or notifications are sent through the mail at work, and in the information age we expose our mail information when shopping online, registering an account, etc. Some merchants will send us advertisements in the form of mailboxes, in which we often receive a large number of invitations for a bank's credit card processing. Some brand promotional activities, even some micro-merchants and other spam emails, which cover some important emails, and deleting one by one will waste a lot of our time, and artificial intelligence applications can do the function of intelligent anti-spam. Artificial intelligence anti-spam technology is all about scanning the information we receive in our mailbox. By categorizing incoming messages by searching for sensitive words or connections, we can process them more easily, protect the security of our mailbox, and save us more mail processing time.

5. CONCLUSION

In summary, in the use of network information technology, through the coordination of network information technologies and the application of computer systems, It is possible to set up a comprehensive data processing and fusion solution in connection with the use of equipment, and then incorporate the problems in the use of artificial intelligence technology, build a computer science and technology use plan, gradually improve the effectiveness of equipment use, and fully meet the high-quality development needs of the industry. Therefore, the use of computer science and technology in the era of artificial intelligence should be integrated into the continued operation and continuous innovation of the industry. Through the application of network security management and data mining technique, we can improve the standardization of system operation and realize the purpose of sustainable operation and high quality development of the industry.

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