(Austin Publishing Group

Research Article

The Development Trend of the Underlying Data of Domestic Operating Systems Combined with AI General Computing Power Industry

Xiaojuan Zhang*

CloudNeedle Information Technology Co., Ltd. Room 106-106M, 107M, (Hangzhou) 5G Innovation Park, China

*Corresponding author: Xiaojuan Zhang, CloudNeedle Information Technology Co., Ltd. Room 106-106M, 107M, (Hangzhou) 5G Innovation Park, China Email: noble@needleos.com

Received: May 29, 2025 **Accepted:** June 05, 2025 **Published:** June 10, 2025

Abstract

The dynamic digital economy leads to the mutual promotion between artificial intelligence (AI) general computing power and domestic operating system technology, market, and policy, which is the main content of this paper. It emphasizes computing power's increasing significance in the facilitation of artificial intelligence and big data use cases, pointing out how the computing power industry is transitioning from pursuit of performance improvements to exploration of more application scenarios and that newer application sectors like smart healthcare and transportation will gain prominence. The integration of AI with domestic operating systems is a major focus area in the paper as it will help in addressing technical problems, improving system compatibility and stability, and reducing the reliance on foreign technologies. This also promotes national information technology infrastructure market competitiveness and self-reliance. The paper describes challenges including compatibility with existing software and hardware, and the stability of domestic systems in real-world situations. The paper provides policy recommendations to encourage technological innovation, build better infrastructure, and broaden market applications to reinforce the AI computing ecosystem. In addition, the paper emphasizes the importance of government support to develop the industry through policies, funding, and strategic plans. With intense global competition in AI, the paper calls for increased cooperation between government, industry, academia and research institutes to propel technological development, ensuring sustainable and maintainable growth.

Keywords: Domestic operating system; Artificial intelligence; General computing power; Technological innovation; Smart transportation; Digital transformation

Introduction

With the rapid development of information technology, computing power is becoming increasingly important as a key resource to support cutting-edge technologies such as artificial intelligence (AI) and big data [1,2]. The purpose of this paper is to discuss the development trend of the underlying data of domestic operating systems combined with the AI general computing power industry, and analyze its key issues in technological innovation, market expansion and policy support. At present, computing power research is undergoing a transformation from simple technical performance improvement to application scenario expansion and infrastructure construction, marking that the computing power industry has entered a new stage of development. Especially in the context of the deep integration of "government, industry, academia, research and application", the highquality development of computing infrastructure has become a key focus area of national policies, which has promoted the extensive expansion of computing power application scenarios. However, there are still many challenges to the compatibility and stability of domestic operating systems with software and hardware, especially in the 5G era, especially in the fields of smart healthcare [3,4] and smart transportation . In order to overcome these technical bottlenecks, various products in the industrial chain are developed in parallel to improve the overall technical level and market competitiveness. The purpose of this paper is not only to reveal the current situation and development trend of the underlying data of domestic operating systems combined with AI general computing power industry, but also to explore how to promote the sustainable development of this field through technological innovation, market expansion and policy support. The study finds that the development of computing technology not only depends on the iterative update of hardware, but also requires the support of software, especially the deep integration of operating systems and AI algorithms. For example, in the 2023 "Huacai Cup' Computing Power Application Innovation Competition, the project "Localized Computing Power Empowers Local Enterprises, Reduces Costs and Increases Efficiency for AI Diagnosis and Treatment" won the first prize, demonstrating the practical application effect of localized computing power in the medical field and significantly improving the efficiency and accuracy of AI-assisted diagnosis4. In addition, the government's leading role in the construction of computing infrastructure cannot be ignored, providing strong computing support for all walks of life through the construction of

Citation: Xiaojuan Zhang. The Development Trend of the Underlying Data of Domestic Operating Systems Combined with AI General Computing Power Industry. Austin J Clin Neurol. 2025; 12(1): 1172.

intelligent computing centers and supercomputing centers, as well as the promotion of computing power leasing services5. The great power competition between China and the United States continues to intensify, and the long-arm jurisdiction and trade sanctions imposed by the United States over China continue to ferment in various fields, and there is already a huge risk of "stuck" and "decoupling of science and technology." China's information industry has long relied heavily on overseas manufacturers in the fields of underlying architecture, standards, and products, and the situation is becoming increasingly severe as the scientific and technological war continues to intensify. The structure of this paper is as follows: firstly, the technological development process of the AI general computing power industry is reviewed, and the current market situation and the importance of industrial development are analyzed. Secondly, the existing research is reviewed, focusing on the impact of key technologies, market demand and policy environment. Thirdly, the development trend is analyzed, and the direction of technological innovation, market expansion potential and policy support expectations are discussed. Subsequently, the challenges and countermeasures are discussed, including technical bottlenecks and solutions, market competition strategies and policy recommendations. Finally, look to the future and anticipate long-term trends, industry development directions, and technological and social impacts. Through the above analysis, this paper aims to provide a valuable reference for researchers and policymakers in related fields.

Research Questions

• What are the technological developments and innovations in combining AI with domestic operating systems?

• What are the technical bottlenecks in integrating domestic operating systems with emerging technologies like 5G, smart healthcare, and smart transportation?

• How can technological innovation, market expansion, and policy support drive the growth of the AI computing power industry? **Table 1.** Comparison between previously published and current work.

• What improvements are needed in domestic operating systems to better support AI applications in critical industries?

• How do government policies foster the development of computing infrastructure and AI applications?

Main Contributions

The main contributions of this study are as follows and mentioned in Table 1:

• Advancing technological integration between AI and domestic operating systems.

• Overcoming technical challenges through innovation.

• Expanding market applications and addressing compatibility issues.

• Highlighting the role of government policy and strategic development for future growth.

Technological Development History

The technological development of the AI general computing power industry can be traced back to the initial construction stage of computing models and technical foundations. Early computing models relied heavily on traditional chips such as CPUs, GPUs, DSPs, and FPGAs, all of which were designed for different purposes, but all played an important role in the development of AI. For example, GPUs were originally designed to meet the graphics and image computing needs of personal computers and some mobile devices, while CPUs were mainly used for computing and control of general-purpose computer systems. With the rapid development of artificial intelligence technology and the continuous optimization of algorithms, the demand for AI computing power is increasing, and traditional chips are gradually adapting to this change, and have launched a variety of computing modes to meet the needs of AI computing, such as Nvidia's CUDA intelligent computing mode,

Ref.			[5]	[6]	This work
Introduction			\checkmark	\checkmark	\checkmark
	Research Question		\checkmark		\checkmark
	Main Contribution				\checkmark
	Comparison with Existing Review				\checkmark
Technological Development History					\checkmark
Current Market Conditions					\checkmark
Importance of Industrial Development			\checkmark		\checkmark
Related Works			\checkmark	\checkmark	\checkmark
	Research on Key Technologies				\checkmark
	Policy E	Environmental Impact			\checkmark
Development Trend Analysis			\checkmark		\checkmark
	6.1	Direction of Technological Innovation			\checkmark
	6.2	Market Expansion Potential			\checkmark
	6.3	Policy Support Expectations			\checkmark
1. Challenges and Countermeasures					\checkmark
	2.	Technical Bottlenecks and Solutions			\checkmark
	3.	Market Competitive Strategy			\checkmark
	4.	Policy Recommendations			\checkmark
5. Future Prospects			\checkmark	\checkmark	\checkmark
	6.	Long-term Development Trends			\checkmark
	7.	Industry Development Direction			\checkmark
	8.	Technological and Social Impacts			\checkmark
9. Conclusion			\checkmark	\checkmark	\checkmark

which significantly improves the performance of vision, voice and other applications1.

Entering the development stage, the innovation of key technologies has become the main driving force for the rapid growth of the AI general computing power industry. During this period, technologies such as algorithm optimization and hardware acceleration have made great progress, especially in the proposal of heterogeneous computing models, marking another important milestone in the development of technology. Heterogeneous computing, as an efficient parallel computing method, achieves a significant improvement in computing performance by working together with general-purpose processors and hardware accelerators, effectively solving the energy efficiency problem of data centers 1. In addition, the representative achievements of this period also include the development of a number of AI chips and major software updates, which not only accelerate the application of AI technology, but also lay a solid foundation for subsequent technological innovation 2.

In the mature stage of technological development, AI general computing technology has reached a high degree of maturity, especially in the combination with domestic operating systems, and has made significant progress. At present, the latest AI computing technology can not only be closely integrated with the underlying data of domestic operating systems, but also greatly improve the performance and security of the system. For example, in the "Huacai Cup" Computing Application Innovation Competition, the project "Localized Computing Power Empowers Local Enterprises, Reduces Costs and Increases Efficiency for AI Diagnosis and Treatment" not only realizes localized substitution by migrating user applications from general computing platforms to localized computing centers, but also significantly improves application performance through a series of optimization methods, providing strong support for AI diagnosis and treatment [7,8]. In addition, the cooperation between China Mobile Zhejiang, Huawei, and AICC has successfully connected computing power to the grid, further promoting the deep integration of AI technology with domestic operating systems, and injecting new vitality into the high-quality development of the medical industry.

In the process of technology integration, the combination of AI technology and domestic operating systems not only promotes the progress of technology itself, but also has a far-reaching impact on the industry. This combination not only improves the overall performance of the system, but also solves the problem of "stuck neck" of foreign technology to a certain extent, and provides strong support for China's scientific and technological self-reliance and self-reliance3. To sum up, the technological development process of the AI general computing industry not only shows the key nodes of technological progress, but also reflects the important impact of technological development on the current industrial development, and provides necessary technical background support for the analysis of technological innovation direction and market expansion potential in the subsequent chapters.

Current Market Conditions

The current market situation shows that the integration and development of domestic operating systems and general computing power is gradually deepening, but the exploration of market segments is still insufficient. As a core component of the computing power industry, the server market has achieved rapid development in recent years, with server shipments of about 3.5 million units in 2021, a yearon-year increase of 9.8%, and domestic server manufacturers such as Inspur, Huawei, H3C, and Lenovo are firmly in the top five domestic server market shares1. These manufacturers not only dominate the domestic market, but also show strong competition in the international market. With the acceleration of digital transformation in industries such as the Internet, telecommunications, government, and finance, the demand for domestic servers is increasing, especially for servers that can support emerging fields such as artificial intelligence, autonomous driving, and the industrial Internet. However, despite the remarkable achievements in the number of domestic servers, there are still great challenges in terms of the compatibility and stability of the operating system with software and hardware, especially in highdemand scenarios such as smart healthcare, smart transportation, AI wide application, and deep learning in the 5G era. In addition, with the rapid development of the digital economy, the demand for computing power has shown an exponential growth trend, which not only puts forward higher requirements for server performance, but also promotes the development of computing power technology in a more systematic and diversified direction3. The high-quality development of computing infrastructure has become the focus of the national strategy, and the support at the policy level has been continuously increased, aiming to promote the expansion of computing power application scenarios and technological innovation. In this context, the importance of AI computing power testing and evaluation has become increasingly prominent, and it has become one of the key indicators to measure the level of national digital development. On the whole, the integration and development of domestic operating systems and general computing power is in a critical transition period, and the future development path will pay more attention to the coordinated promotion of technological innovation, market expansion and policy support. At present, most of the traditional data centers are used for basic functions such as to B-side data storage, and they are not really full. It meets the computing power needs of artificial intelligence, cloud computing, supercomputing, and intelligent computing required for the development of industrial digitalization and informatization, and generally has shortcomings such as extremely long payback cycle, single profit model, and shrinking service group.

Importance of Industrial Development

In the context of the AI general computing power industry, the importance of industrial development is particularly prominent. Mature general computing platforms such as OpenAI and ChatGPT, as well as the world's leading underlying operating systems such as Microsoft, Apple, and Android, have formed a relatively complete ecosystem in the overall layout of mobile and desktop operating systems and integrated scheduling computing platforms. At present, the hardware products of the industrial control end are equipped with traditional Android and Windows systems, with high hardware iteration requirements and poor user experience. Domestic operating system foundation + AI general computing power, the overall development ideas and concepts of the industry are different from Windows, Android, and IOS, if it is completely directly compatible and compatible with most of the computing terminal equipment (including chips) and software in the current international

and domestic markets, technically through hyper-convergence technology, it can perfectly open up the "cloud-edge-end", and realize the all-round collection and precise scheduling and operation of ecological, life, and production computing power . Then the speed at which we change lanes and overtake will be more objective. In contrast, although China has made some progress in the AI general computing industry, it still faces great challenges in the integration and optimization of the overall industrial chain. In particular, in the construction of mobile and desktop operating systems and integrated scheduling computing platforms, there is still a lack of overall solutions that can compete with international giants, which limits China's long-term development ability in the international market. Therefore, strengthening the research and development of domestic operating systems, improving the computing power of domestic chips, and enhancing the compatibility and stability of software and hardware are essential to meet the needs of smart healthcare, smart transportation, AI wide application, and deep learning in the 5G era4. In addition, through the integration of advanced R&D management system tools such as product development (IPD), promote the parallel research and development of various products in the industrial chain, improve the overall technical level, and combine the underlying data of the domestic operating system with the application ecology of the general practitioner adopted by the AI general computing industry, adhering to the principle of computing to the cloud, it can avoid "the more you use the more you get stuck", abandon the traditional system design ideas, streamline the kernel, the memory proportion is small, the running speed is fast, the hardware dependence is low, the user is point-and-use, and the local "garbage" is zero.

At the same time, it also makes it impossible for malware to decompile and steal user privacy, making security simpler and providing Massive light-end applications, compatible with Android, Windows, and a rich application ecosystem. Based on hyper-converged technology, we strive to build a market-based project that integrates government, industry, academia, research and application based on independent research and development, driven by scientific and technological innovation, and based on intelligent equipment, which is the key path for China's AI general computing industry to achieve leapfrog development. Driven by the needs of industrial Internet, cloud computing, artificial intelligence and other applications, it gathers multiple data resources, provides efficient computing services, empowers thousands of industries, and provides strong support for the acceleration of innovation in the new generation of information technology. Computing power is a new quality productivity in the era of digital economy, which needs to provide services to the society through computing infrastructure. The goal of building an integrated computing service system is to provide computing power to users in a timely, fast and economical manner. It allows users to call computing Table 2: Previously published work related to our study

resources anytime and anywhere, so as to continuously lower the threshold for use and expand computing application scenarios.

Cloud Needle takes products as the export and market as the guide, and distributes the value of computing resources to every link in all walks of life. In the professional field business of the original intelligent computing center (AI inference, big data analysis, smart city, digital twin) at the same time, high combination with the availability of the whole industry equipped with domestic operating systems, computing power terminal products and high performance.

The computing productivity of the intelligent computing center innovatively proposes consumer computing power scenarios, and binds, pulls and empowers each other in the digital industry chain. Compared with the traditional intelligent computing center, the underlying data of the domestic operating system combined with the AI general computing power and the product runs through the long chain and the vertical field is deep.

Related Works

The combination of the underlying data processing technology of the domestic operating system and the AI general computing technology constitutes an important research direction in the field of information technology [9]. The development of the underlying data processing technology of domestic operating systems has not only achieved a qualitative leap in the functionality, stability, compatibility and performance of a single product, but also made significant progress in ecological construction, although there is still a certain gap in ecological construction compared with international mainstream operating systems such as Windows. The introduction of AI general computing technology has further improved the comprehensive performance of domestic operating systems, especially in data processing, model processing, training and reasoning, and intelligent applications, providing strong support for the performance improvement and application expansion of domestic computing platforms (Table 2).

The specific implementation methods of key technologies involve multiple levels, including localized basic hardware (domestic processors + domestic AI chips), basic environment, AI services, integrated development environment (IDE), and unified operation and maintenance management. By adapting to the basic layer drive and operating environment, these technologies build a basic platform integrating data processing, model processing, training and reasoning, and intelligent application, aiming to improve the computing power of domestic computers and servers, and at the same time tap the application potential of domestic computing platforms after integrating AI modules. For example, by integrating domestic basic hardware and AI chips to build a heterogeneous AI

Ref	Year	Objective	Measure	Journal
Karmakar et al. [10]	2024	Analysis	Laplace transform	Sensors and Actuators: A. Physical
Bagloee et al. [11]	2021	Integration	Blockchain	Cities
Langer et al. [12]	2024	Optimization	Optionally on-device or offloaded	Future Generation Computer Systems
Bhowmik et al. [13]	2024	Modelling and Simulation	AutoML framework called CloudAlSim	BenchCouncil Transactions on Benchmarks, Standards and Evaluations
Phan et al. [14]	2023	Implementation	Uni-axial motion	Internet of Things
Schmitt et al. [15]	2023	Securing and Protection	IoT Security	Journal of Industrial Information Integration

environment, it can effectively solve the problem that traditional chips are not fully matched with AI algorithms and applications in terms of design intentions, so as to provide more efficient computing power support in vision, voice and other application fields.

The comparative analysis of domestic and foreign technologies shows that although domestic technology has reached or even exceeded the international advanced level in some specific fields, there is still a certain gap in the overall technology maturity, innovation ability and market application scope. For example, the computing power of domestic chips, the compatibility and stability of domestic operating systems with software and hardware, etc., cannot fully meet the requirements of high-demand scenarios such as smart healthcare, smart transportation, AI wide application, and deep learning in the 5G era . However, in recent years, through a series of technological breakthroughs and innovations, domestic technologies are gradually narrowing the gap with the international advanced level, especially in applications in specific industries, such as pathological recognition AI-assisted diagnosis scenarios in the medical industry.

In the face of the challenges of technological development, such as technical bottlenecks and resource constraints, relevant domestic enterprises and research institutions are actively seeking solutions to promote technology integration and innovation and improve the overall level of the industrial chain by strengthening industryuniversity-research cooperation. At the same time, the government has also given strong support at the policy level, encouraged independent innovation, promoted the transformation and application of scientific and technological achievements, and created a good external environment for the integration and development of the underlying data processing technology of domestic operating systems and AI general computing technology. In short, the development of key technologies is not only of great significance for enhancing the market competitiveness of domestic operating systems, but also provides solid technical support for promoting the overall progress of China's information technology industry and the sustainable and healthy development of the national economy.

Research on Key Technologies

In the analysis of the market demand of the AI general computing industry, the first thing that needs to be clarified is the overall overview of the market demand. According to the latest data, the AI computing power market is showing a significant growth trend, especially driven by deep learning algorithms, and the demand for computing power is doubling roughly every six months, which is much faster than the traditional Moore's Law. This rapid growth is not only reflected in the expansion of the market size, but also in the diversification of application areas. For example, in the healthcare sector, China Unicom has served more than 300 hospitals, providing them with cloud services and cloud solutions. In the field of industrial Internet, operators such as China Mobile, China Telecom, and China Unicom are also actively deploying AI infrastructure such as intelligent computing centers to meet the growing demand for computing power. The demand characteristics of users in different industries also show obvious differences. For the healthcare industry, data security and privacy are top of mind, and high-performance computing power is essential. In the field of industrial Internet, users are more concerned about the real-time and reliability of computing power, and how to improve production efficiency through efficient data processing. In addition, cost-effectiveness is also one of the important considerations for many users when choosing computing services. For example, for small and medium-sized enterprises, lowcost computing power leasing services have become an effective way for them to access advanced computing resources.

The growth of market demand has had a profound impact on the development of the AI general computing industry. On the one hand, the increase in market demand has promoted technological innovation and service model innovation. For example, in response to the surge in demand for computing power, many enterprises have begun to explore new computing architectures and technologies, such as liquid cooling, to improve the energy efficiency ratio of data centers and reduce operating costs. On the other hand, changes in market demand have also led to the evolution of the market competition pattern. As more non-traditional IT companies join the computing power market, such as new energy companies and food and beverage companies, market competition has become more intense, and at the same time, it has also brought new vitality to the industry. In addition, the diversification of market needs is driving companies to offer more customized solutions to meet the specific needs of users in different industries.

To sum up, the market demand of the AI general computing power industry shows a strong growth momentum and a wide range of application prospects. Through the in-depth analysis of market demand, it can provide a solid empirical basis for subsequent discussions on market expansion potential and technological innovation direction. In the future, with the continuous progress of technology and the further release of market demand, the AI general computing industry is expected to usher in a broader space for development.

Policy Environmental Impact

When discussing the impact of the policy environment on the development of domestic operating systems and AI general computing industry, it is not difficult to find that policy support plays a vital role in promoting technological innovation and market expansion. In recent years, with the country's emphasis on information security and independent and controllable technology, a series of policies and measures aimed at promoting the development of domestic operating systems and AI chips have been introduced, providing a good development environment and policy dividends for relevant enterprises. For example, in 2021, the National Natural Science Foundation of China launched the "Research on Ubiquitous Operating System and Ecological Construction" project, which aims to address the major strategic needs of the country in terms of operating system and its ecology, and explore new theories and methods for ubiquitous computing scenarios. In addition, the "14th Five-Year Plan for the Development of Software and Information Technology Service Industry" issued by the Ministry of Industry and Information Technology (MIIT) also clearly points out that it is necessary to increase support for theoretical and technical research related to "software-defined" and ubiquitous operating system platforms, which undoubtedly lays a solid foundation for the long-term development of domestic operating systems. However, although the policy environment provides strong support

for the development of domestic operating systems and AI general computing power industry, enterprises are also facing the challenge of how to stand out in the fierce market competition while enjoying policy dividends. Especially in the case that there is still a big gap between domestic operating systems and international mainstream products such as Windows, how to improve product compatibility, stability and user experience through technological innovation and optimization of market strategies has become an important issue in front of enterprises. To this end, relevant enterprises not only need to strengthen cooperation with domestic and foreign scientific research institutions to promote breakthroughs in key technologies, but also pay attention to market feedback, constantly adjust and improve product lines, so as to better meet user needs and achieve sustainable development. In short, only by combining policy support with independent innovation of enterprises can we promote the healthy and rapid development of domestic operating systems and AI general computing power industries in a complex and changeable market environment.

Development Trend Analysis

Direction of Technological Innovation

When discussing the technological innovation direction of the underlying data of domestic operating systems combined with the AI general computing power industry, it is first necessary to clarify the importance of technological innovation in this field. With the rapid development of artificial intelligence technology and the increasing demand for computing power, traditional chips such as CPUs, GPUs, DSPs, and FPGAs are not designed for AI algorithms and applications, but through continuous optimization and innovation, such as Nvidia's CUDA intelligent computing mode, the performance of AI computing has been significantly improved1. In this context, technological innovation is not limited to the breakthrough of a single technology, but also lies in the comprehensive application of multiple technologies, such as high-performance computing technology, big data processing capabilities and artificial intelligence algorithm optimization, etc., which together constitute a key path to promote the development of the AI general computing industry.

The feasibility analysis of these key technology pathways can be comprehensively evaluated from multiple dimensions such as technology maturity, cost-effectiveness, and market demand. For example, heterogeneous computing, as a special parallel computing method, can effectively break through the limitations of system size, computing density, and system energy consumption by combining general-purpose processors with hardware accelerators, and significantly improve computing efficiency. In addition, the development of multi-modal fusion computing and multi-core heterogeneous intelligent processors aims to solve the limitations of complex scene processing capabilities and deep learning algorithms faced by AI technology in the application. The exploration and implementation of these technical paths are not only feasible in theory, but also show great potential in practical applications, providing a solid foundation for improving system performance, optimizing user experience and enhancing security.

Further, through the support of cases and data, the actual role of technological innovation in promoting industrial development can

Austin Publishing Group

be more intuitively demonstrated. For example, in the application of high-performance computing technology, an enterprise has achieved a significant improvement in computing performance and significantly reduced energy consumption and operating costs by introducing advanced heterogeneous computing architectures, which has received positive feedback from the market. In another case, a company that optimized its big data processing capabilities not only improved the speed of data processing, but also enhanced data security and privacy protection capabilities when processing large-scale datasets, effectively meeting the needs of users5. These successful cases not only verify the feasibility of technological innovation, but also provide valuable reference experience for other enterprises' technological innovation.

At the same time, in view of the promotion of the national information and innovation engineering plan and the development of artificial intelligence, as well as the development constraints and monopolies of domestic semiconductor products (high-end graphics card chips, high-end processor chips) from overseas (Nvidia, Intel), the industry should conform to the layout of the future industry of the country's new quality productivity, and the new generation of computing power model equipped with the "domestic operating system" combined with the "intelligent computing center" platform will be the future trend.

The core competitive advantages of the project of "Combining the Underlying Data of Domestic Operating Systems with AI General Computing Industry" are: high-availability industry-wide computing terminal products and high-performance intelligent computing center computing power new quality productivity, which are bound by business, pull each other, and empower each other in the digital industry chain.

However, there are also many challenges in the process of technological innovation, such as technical barriers and market acceptance issues. To this end, effective countermeasures are needed, such as strengthening cross-departmental collaboration, promoting platform-based R&D, and implementing a structured parallel development process, to ensure the smooth progress of technological innovation2. In short, by clarifying the direction of technological innovation, in-depth analysis of the feasibility and potential impact of the technology path, with the support of successful cases, and proposing effective strategies to deal with the challenges, this chapter aims to provide reference and guidance for the technology research and development of the underlying data of domestic operating systems combined with the AI general computing industry, and emphasize the importance of technological innovation in promoting the development of the industry. Fully explore the commercial highlights of the underlying data of domestic operating systems combined with the core technology of AI general computing power, and ensure the penetration and substitution of technology barriers in upstream and downstream nodes such as cloud computing service providers, core intelligent manufacturing supply chains, and integrated solution providers. It is extremely important to create a global leading technology and cutting-edge technology research and development highland in the information industry to create a joint construction and benefit in the development of all links, to create an enterprise laboratory integrating core technology research, strategic research and pioneering research, driven by technological innovation and based on information network.

Market Expansion Potential

The potential for market expansion is one of the important dimensions to evaluate the development prospect of the AI general computing industry. This chapter aims to provide a solid foundation for subsequent market competition strategies and policy recommendations by analyzing the market size, growth rate, potential customer groups, and expansion opportunities in market segments. First of all, according to the latest market research report, the current global AI general computing market has reached tens of billions of dollars and is expected to grow at a compound annual growth rate of more than 30% in the next five years3. This growth trend is driven not only by continuous technological innovation, but also by a combination of the policy environment and expanding market demand3. In terms of potential customer group analysis, the main customer groups of AI general computing services cover multiple industries such as finance, healthcare, and education. For example, in the financial industry, AI general computing power is widely used in scenarios such as risk assessment and transaction decision-making, effectively improving the efficiency and accuracy of business processing. In the medical field, AI general-purpose computing power has shown great potential in disease diagnosis and personalized treatment plan formulation2. In addition, with the increasing demand for intelligence, enterprises in industries such as education, manufacturing, and transportation have begun to actively seek AI general computing solutions to achieve business transformation and upgrading3.

For the expansion opportunities in market segments, areas such as autonomous driving and intelligent manufacturing are particularly noteworthy. In the field of autonomous driving, AI general computing power can not only provide powerful data processing capabilities to support functions such as vehicle perception of the environment and path planning, but also continuously optimize the driving experience and improve safety through deep learning algorithms4. In the field of intelligent manufacturing, the application of AI general computing power can help realize intelligent control of the production process, improve production efficiency and product quality, and reduce energy consumption and costs. The rapid development of these market segments provides a broad market space and huge business opportunities for the AI general computing power industry.

However, there are also a number of challenges in the process of market expansion. Technology maturity, cost concerns, and user acceptance are the key factors that affect the speed of market expansion. For example, although AI general computing technology has made significant progress in theoretical research, there are still many technical problems in practical application, such as the stability and reliability of algorithms, data privacy protection, and other issues4. In addition, high costs are also a significant factor limiting market expansion, especially among SMEs, where high initial investment may hinder the adoption of AI general-purpose computing solutions. In order to overcome these challenges, on the one hand, it is necessary to reduce costs and improve the ease of use and reliability of technology through technological innovation; On the other hand, governments and industry organizations should introduce more supportive policies to guide and incentivize enterprises to increase R&D investment and promote the popularization and application of technology3. It is particularly important to expand the consumer group of computing power, enrich the downstream business format of computing power, and build a new intelligent computing center with the advantages of large user volume, short payback period, low hardware dependence, and low comprehensive operating costs, so as to create a new benchmark for intelligent computing center. To sum up, the AI general computing industry has shown great potential and broad development prospects in terms of market expansion. Through an in-depth analysis of the market size, potential customer groups, and market segments, this chapter provides a comprehensive perspective for understanding the market expansion potential of the AI general computing industry, and lays a foundation for effective market competition strategies and policy recommendations in the future.

Policy Support Expectations

Policy support plays a crucial role in the development of the AI general computing industry. By formulating a series of policies and measures, the government has not only provided the necessary funds and resources for the industry, but also created a good environment conducive to technological innovation and market expansion. At present, the national and local governments have issued a number of support policies, covering capital investment, tax incentives, R&D support and other aspects. For example, the central government's 14th Five-Year Plan has clearly stated that it will increase investment in AI and computing infrastructure, and local governments have successively introduced corresponding supporting policies, such as providing tax exemptions and setting up special funds, to promote the development of the AI general computing industry2. The implementation of these policies has significantly improved the R&D capabilities and market competitiveness of enterprises, and promoted technological progress and market expansion.

Although the existing policies have achieved certain results, there are still some deficiencies, such as insufficient policy implementation and imperfect supporting measures, which restrict the healthy development of the industry to a certain extent3. From the policy support, the commercialization of the underlying data of the domestic operating system combined with AI general computing power is to explore and improve its applicability, standardization, and industrial chain of its system attributes, core applications, hardware combination, and intelligent computing concurrency, and fundamentally grasp the right to speak in the market competition of innovative underlying systems combined with new general computing power. In order to further promote the development of the AI general computing industry, it is necessary to start from the following aspects: first, increase financial support, especially in key technology research and major project construction, and provide more financial support; secondly, optimize tax policies, reduce the tax burden of enterprises, and increase the enthusiasm of enterprises in R&D investment; Thirdly, establish a more perfect industryuniversity-research cooperation mechanism, encourage cooperation between universities, scientific research institutions and enterprises, and accelerate the transformation and application of scientific and technological achievements; Finally, strengthen international exchanges and cooperation, learn from foreign advanced experience, and enhance China's competitiveness in the international computing market45. Through the implementation of the above measures, the

problems in the current policy environment can be effectively solved and a solid guarantee can be provided for the long-term development of the AI general computing power industry. To sum up, the role of the government in the development of the AI general computing industry is indispensable, and through continuous improvement of the policy system, we can better guide and support the healthy development of the industry and contribute to the high-quality development of China's digital economy.

Challenges and Countermeasures

Technical Bottlenecks and Solutions

The marketization process of domestic operating systems in many fields is relatively slow, especially in the computing industry, although there are many options in the market, but not many can be truly commercialized. In contrast, several major international players have made significant progress in this area, not only due to their strong technology research and development capabilities, but also due to the construction of their well-established ecosystems2. However, in the face of the technological gap at home and abroad, the domestic computing power industry is not helpless. By integrating domestic basic hardware and AI chips, a heterogeneous AI environment can not only improve the computing power of localized computers and servers, but also fully tap the application potential of domestic computing platforms after integrating AI modules1. In addition, in view of the shortcomings of domestic operating systems in terms of compatibility, function, performance, stability, reliability, and ease of use, future research and technological breakthroughs will focus on the construction of the domestic computing ecological development and operation environment, the integration and adaptation of domestic computing platform software, the promotion of domestic computing ecology, and the cultivation of talents, so as to promote more enterprises to invest in the construction of domestic computing ecology and form a virtuous circle. In this process, building an integrated computing platform based on heterogeneous hardware acceleration of domestic CPUs and NPUs to solve the problems of infrastructure operation and maintenance deployment, massive data storage, and timeliness processing will become one of the key technical paths. Finally, in order to overcome the challenges of insufficient computing power, poor compatibility between the operating system and software and hardware, and low stability of domestic chips, it is necessary to further strengthen the integration of the industrial chain and adopt advanced R&D management system tools such as integrated product development (IPD) to improve the overall technical level and meet the needs of smart healthcare, smart transportation, AI wide application and deep learning in the 5G era.

Market Competitive Strategy

Before discussing the market competition strategy of domestic operating systems in the AI general computing industry, it is necessary to review the previous discussion on the background and development trend of the AI general computing power industry to clarify the importance of market competition strategies. As an important part of the AI general computing industry, the market performance of domestic operating systems directly affects the competitiveness and development potential of the entire industry. At present, domestic operating systems occupy a certain market share in the AI general computing power market, but there is still a large gap compared with leading international brands. According to the latest data, the market share of domestic operating systems is about 15%, and the main user groups are concentrated in government agencies and stateowned enterprises, while the acceptance of small and medium-sized enterprises and individual users is relatively low. In the face of strong competitors, domestic operating systems need to have an in-depth understanding of the technical level, market strategy and service model of the opponent to formulate effective countermeasures. For example, leading international operating system vendors such as Microsoft and Apple have firmly occupied a dominant position in the market with their strong ecosystems, stable performance and wide application support. These companies' continuous investment in technology research and development ensures that their products are at the forefront of security, compatibility, and user experience. In contrast, although the domestic operating system has made progress in policy support and technology accumulation, it still needs to be strengthened in terms of ecological construction and user stickiness. Based on SWOT analysis, domestic operating systems have obvious advantages in terms of independent and controllable technology and policy support, but there are deficiencies in market promotion and ecological construction. In addition, with the development of emerging technologies such as 5G and the Internet of Things, domestic operating systems are facing huge market opportunities, but they are also threatened by international technology blockades and intensified market competition. Therefore, domestic operating systems should adopt the following strategies to increase market share and competitiveness: first, increase technological innovation, especially in AI algorithm optimization, software and hardware collaborative design, etc., to improve product performance and stability; Secondly, strengthen the construction of the ecosystem, and enrich the application ecology and improve user stickiness through cooperation with hardware manufacturers and software developers. Thirdly, to expand market channels, not only pay attention to the government and enterprise markets, but also actively explore the small and medium-sized enterprises and individual markets, and expand the user base; Finally, strengthen brand building and user service, enhance brand image, and enhance user trust and satisfaction. Through the implementation of the above strategies, the domestic operating system is expected to stand out in the fierce market competition and achieve steady growth in market share. For example, the project "Localized Computing Power Empowers Local Enterprises, Reduces Costs and Increases Efficiency for AI Diagnosis and Treatment" in the "Huacai Cup" Computing Power Application Innovation Competition demonstrated the successful application of domestic operating systems in the medical industry, which not only enhanced the market influence of domestic operating systems, but also provided valuable experience for the application and promotion of other industries. To sum up, through technological innovation, ecological construction, market expansion and brand services, domestic operating systems can make greater breakthroughs in the AI general computing industry and contribute to the development of China's information technology industry.

Policy Recommendations

When discussing the policy suggestions for combining the underlying data of domestic operating systems with AI general computing power industry, it is necessary to clarify the impact of

the current policy environment on the development of the industry and the main problems. At present, although China has made certain achievements in the field of artificial intelligence, there are still problems in the policy environment, such as insufficient capital investment, high market access thresholds, and high pressure from international competition1. For example, although the state has introduced a number of policies and measures to support the development of the AI industry, in practice, the allocation mechanism of scientific research funds is not flexible enough, and it is difficult to effectively support the research and development of cuttingedge technologies. At the same time, the market access conditions are relatively strict, which increases the difficulty of enterprises to enter the market and affects the rapid development of the industry. In addition, international technology blockade and trade barriers also pose challenges to the internationalization process of China's AI general computing industry. In view of the above problems, this paper puts forward the following targeted and feasible policy suggestions. First of all, in terms of technological innovation support, the government should further increase the investment in scientific research, especially for basic research and research and development of key technologies, and can set up special funds to encourage enterprises to cooperate with universities and research institutions to jointly overcome technical difficulties2. Second, we need to optimize market access policies, simplify the approval process, reduce compliance costs for enterprises, and strengthen market supervision to ensure fair competition in the market and create a favorable market environment for the AI general computing industry1. Third, to strengthen international cooperation, the government should actively promote international technical exchanges and cooperation, participate in the formulation of international standards, and improve the competitiveness of domestic enterprises in the international market. This not only helps the introduction and digestion and absorption of technology, but also promotes the brand building and market development of Chinese enterprises in the world. Finally, we should pay attention to the cultivation and introduction of talents, increase the cultivation of talents in related fields through the establishment of special scholarships and scientific research projects, and relax the visa and residence restrictions for foreign high-end talents, so as to attract more top international talents to join China's AI general computing industry. In the implementation path of policy recommendations, it is necessary to clarify the specific steps of policy formulation, implementation supervision and effect evaluation, and put forward corresponding safeguard measures. In the policy formulation stage, opinions from inside and outside the industry should be widely solicited to ensure the scientific and feasibility of the policy; In the implementation supervision stage, an effective supervision mechanism is established to ensure that the policy is effectively implemented; In the effect evaluation stage, the effect of policy implementation is regularly evaluated, and relevant policies are adjusted and improved in a timely manner5. In addition, it is necessary to pay attention to the obstacles that may be encountered in the process of policy implementation, such as poor policy coordination and insufficient implementation, and take effective measures to overcome them. To sum up, through the implementation of the above policy recommendations, it is expected to significantly enhance the technological innovation capability, market competitiveness and international influence of China's AI general computing industry, and inject new impetus into the high-quality development of the economy. The role of policies in promoting technological innovation, market expansion and international cooperation cannot be ignored, and its successful implementation will lay a solid foundation for the sustainable development of China's AI general computing industry.

Future Prospects

Long-term Development Trends

When discussing the long-term development trend of the underlying data of domestic operating systems combined with AI general computing power industry, it is necessary to review the current development background and current situation in order to better understand the future development path. In recent years, with the rapid development of AI technology, computing power, as a core resource to support AI applications, has become increasingly important. Computing power research has shifted from simple technical performance improvement to application scenario expansion and related infrastructure construction, which marks a new stage of development for the computing power industry. In this context, AI technology will continue to evolve, especially in algorithm optimization and computing efficiency improvement, which can not only promote the performance improvement of domestic operating systems, but also further enhance their market competitiveness.

From the perspective of market demand, with the continuous expansion of AI application scenarios, the market demand for AI computing power will show a significant growth trend, especially for specific fields such as high-performance computing and edge computing. This change in demand will prompt enterprises to increase investment in related technologies, and also provide a broader application space for domestic operating systems. For example, by supporting the mainstream GPGPU ecology at home and abroad and a variety of mainstream deep learning frameworks, the Tianyi 100 chip effectively solves the problems of difficult product use and high cost of development platform migration, and provides strong support for the application of domestic operating systems in the field of AIA.

In terms of policy environment, a number of policies and measures have been introduced at the national level to promote the healthy development of the AI general computing industry. These policies not only cover various aspects such as capital investment and technology research and development, but also emphasize the importance of human resource development. For example, the government encourages enterprises to cooperate with universities and scientific research institutions to jointly promote the R&D and industrialization of key technologies, which has laid a solid foundation for the longterm development of the AI general computing industry. In addition, policy support will also help solve some practical problems faced by domestic operating systems in the process of market promotion, such as compatibility with existing software and hardware ecosystems.

Based on the influence of the above technology, market and policy drivers, it is foreseeable that the underlying data of domestic operating systems combined with AI general computing power industry will usher in a broader development prospect in the future. This process will not only promote the adjustment of the industrial structure and the improvement of the competitiveness of enterprises, but will also have a far-reaching impact on the social and economic structure. The popularization of AI technology will further promote the digital transformation of the social economy, change the traditional form of employment, and also bring new social issues and challenges, such as privacy protection and data security4. Therefore, while pursuing technological innovation and market expansion, it is also necessary to pay attention to these social issues to ensure that technological development is coordinated with social needs to achieve sustainable development.

In short, the long-term development trend of the underlying data of domestic operating systems combined with the AI general computing power industry shows the characteristics of technology, market, and policy. In the face of future challenges and opportunities, it is necessary for the government, enterprises and scientific research institutions to work together to promote the healthy, stable and sustainable development of the industry through technological innovation, market expansion and policy guidance, and contribute to the construction of a digital China.

Industry Development Direction

The development direction of domestic operating systems in the AI general computing power industry is not only related to technological innovation and breakthroughs, but also directly affects the expansion of the market and the long-term development of social economy. First of all, the positioning of domestic operating systems in the AI general computing industry is crucial, as it is not only a bridge between hardware and software, but also a key link to achieve efficient, safe, and reliable computing services. In this context, the development of domestic operating systems needs to focus on technological innovation, especially in algorithm optimization, hardware compatibility improvement, and security performance enhancement. For example, improving computing efficiency by optimizing algorithms, enhancing compatibility with various hardware devices, and ensuring the stable operation of the system are all important directions to promote breakthroughs in the field of AI general computing power for domestic operating systems. In terms of market expansion, domestic operating systems should actively seek diversified application scenario development, especially in key industries such as the Internet, telecommunications, government, and finance, and the digital transformation of these industries provides a broad application space for domestic operating systems. At the same time, strengthening international cooperation and exchanges, and learning from advanced international experience, can effectively promote the internationalization process of domestic operating systems and further expand their market influence3. In addition, the development of domestic operating systems has a far-reaching impact on national information security, economic development and international competitiveness. Through independent research and development of core technologies and products, it can not only reduce dependence on external technologies and improve national security, but also establish a brand image in the international market and enhance the country's scientific and technological strength and international competitiveness4. Specific case studies show that localized computing power empowers local enterprises to apply AI in the field of diagnosis and treatment, which not only achieves effective cost control, but also significantly improves the efficiency and accuracy of diagnosis and treatment5. This successful experience provides valuable experience and enlightenment for the promotion and application of domestic operating systems, indicating that through the organic combination of technological innovation and market strategy, domestic operating systems are fully capable of playing a more important role in the AI general computing industry. Based on the above analysis, this paper puts forward the following policy recommendations and technical roadmaps: first, increase R&D investment to support the innovation of core technologies of domestic operating systems; the second is to optimize the market environment and encourage the wide application of domestic operating systems in various industries; The third is to strengthen international cooperation and enhance the international competitiveness of domestic operating systems. Through these measures, it is expected to lay a solid foundation for the sustainable development of domestic operating systems in the AI general computing industry.

The underlying data of the domestic operating system combined with the AI general computing power industry provides software and hardware products equipped with domestic operating systems in smart cities, smart education, smart offices, smart hotels, smart entertainment, smart cultural tourism, smart medical care, smart water, smart transportation, etc., and provides the overall solution of consumer cloud computing with general computing power.

Technological and Social Impacts

When discussing the impact of the underlying data of domestic operating systems combined with the AI general computing power industry on technology and society, we first reviewed the development background of the industry and emphasized its role in technological innovation and the improvement of intelligence. The application of AI general computing power in domestic operating systems not only improves computing efficiency, but also promotes the widespread application of intelligent technologies1. At the economic level, the AI general computing industry has made significant contributions to economic growth, including creating new market opportunities, increasing employment opportunities, and promoting the adjustment of industrial structure. Especially in emerging industries, such as smart healthcare, smart transportation, and other fields, the application of AI general computing power has accelerated the technological progress and service quality improvement of these industries. In the field of education, the introduction of AI general computing power has changed the traditional teaching model, making educational resources more abundant and accessible, and providing technical support for personalized teaching. For example, through AI technology, real-time monitoring and feedback on students' learning can be realized, so as to provide more personalized learning paths and resource recommendations. In the field of medical and health care, the application of AI general-purpose computing power has also brought revolutionary changes. Improvements in precision medicine, disease prediction, and telehealth services have not only improved healthcare efficiency, but also enhanced access to and quality of health care4.

However, the development of technology also comes with a range of ethical and privacy concerns. Data security, privacy protection, and algorithmic bias have become the focus of social concern. In order to meet these challenges, there is a need for robust data management and privacy protection mechanisms to ensure that technology evolves without violating individual privacy and data security5. In addition, technological advances are likely to exacerbate social inequalities,

especially in resource allocation and access to technology. Therefore, it is important to promote the equitable use of technology through policy and technological means. Governments and businesses should work together to ensure that technological progress benefits society as a whole and avoid a widening of the technology divide.

Conclusion

This paper reviews the development status, challenges and future trends of the domestic operating system underlying data combined with AI general computing power industry. The study found that the industry has made significant progress over the past few years, especially in terms of technological development and market expansion. The history of technological development shows that from the initial stage to the rapid rise, computing power research has gradually been systematized and diversified, and the highquality development of computing infrastructure has become the focus2. The current market situation shows that server shipments are increasing year by year, domestic server brands are firmly at the forefront of market share, the proportion of server procurement localization in Internet, telecommunications, government, finance and other industries is increasing, and the emergence of diversified application scenarios has further promoted the rapid development of the market1. The importance of industrial development lies in the fact that computing power has become a key force to promote industrial innovation, upgrading and digital transformation, especially in the fields of artificial intelligence, autonomous driving, and industrial Internet, where the demand for computing power is increasingly segmented and differentiated1. In terms of key technology research, computing technology has not only achieved significant improvements in performance, but also made important progress in the expansion of application scenarios and the construction of infrastructure2. Market demand analysis points out that with the rapid development of the digital economy, the demand for computing-intensive computing has increased dramatically, especially in the fields of supercomputing, data centers, and urban brains, and the advantages of AI computing are becoming more and more obvious. In terms of policy and environmental impact, the state has issued a number of policies to support the construction of computing infrastructure and technological innovation, promote the expansion of computing power application scenarios, and form a good situation of deep integration of "government, industry, academia, research and application3". In terms of technological innovation, computing technology will pay more attention to integrity and framework in the future, and the application of computing power in the field of digital economy and the system construction of computing power network will become the main research directions. With the exponential growth of computing power demand, computing power is deeply penetrating all walks of life and becoming an important driving force for industrial upgrading. In terms of policy support, the state will further strengthen policy support related to computing power, accelerate the construction of computing infrastructure, promote the research and development of core technologies, and promote the healthy and sustainable development of the computing industry. In the face of technical bottlenecks and solutions, the supply side needs to actively approach industry application scenarios, carry out adaptation, verification, optimization, and research of various applications and full-stack technologies, and open up the positive driving chain of applications

and innovation. In terms of market competition strategies, enterprises should strengthen independent innovation, improve product quality and service levels, actively respond to international competition, and expand market share4. Policy recommendations include accelerating the construction of a computing technology innovation system with independent technology as the engine, strengthening policy support related to computing power, promoting the green and low-carbon development of computing infrastructure, and building a multi-level computing power facility system. The domestic operating system links all kinds of terminals = the underlying data of the domestic operating system combines with the AI general computing power to successfully create an ecological pattern of central interconnection and interconnection of all things, which is not afraid of the restrictions of foreign mainstream operating systems, and can be combined with various livelihood engineering systems, medical education systems and life service systems to help enterprises create full-scene applications such as smart government affairs, smart logistics, and smart streets, improve work efficiency, quality and safety, and promote the digital development of various social affairs. For those who have high configuration needs for terminal equipment, the underlying data of the domestic operating system combined with AI general computing power can be perfectly compatible with various systems, and there is no need to consider the adaptability of the conversion system. At the same time, the interactive operation between the virtual back-end and the front-end can also greatly improve the user experience, providing a more concise and ultimate scientific and technological enjoyment.

References

- Z Waheed, et al. "A novel lightweight deep learning-based approaches for the automatic diagnosis of gastrointestinal disease using image processing and knowledge distillation techniques." Comput. Methods Programs Biomed. 2025; 260: 108579.
- MB Bin Heyat, et al. "Unravelling the complexities of depression with medical intelligence: exploring the interplay of genetics, hormones, and brain function." Complex Intell. Syst. 2024; 10: 5883–5915.
- MB Bin Heyat, et al. "Wearable Flexible Electronics Based Cardiac Electrode for Researcher Mental Stress Detection System Using Machine Learning Models on Single Lead Electrocardiogram Signal." Biosensors. 2022; 12: 427.
- 4. F Akhtar, et al. "Medical intelligence for anxiety research: Insights from genetics, hormones, implant science, and smart devices with future strategies," Wiley Interdiscip. Rev. Data Min. Knowl. Discov., p. WIREs Data Mining and Knowledge Discovery. 2024; e1552.
- N Emaminejad and R Akhavian. "Trustworthy AI and robotics: Implications for the AEC industry." Autom. Constr. 2022; 139104298.
- Ghahremani, SD Adams, M Norton, SY Khoo and AZ Kouzani. "Advancements in Al-Driven detection and localisation of solar panel defects." Adv. Eng. Informatics. 2025; 64: 103104.
- MB Bin Heyat, D Lai, FI Khan and Y Zhang. "Sleep Bruxism Detection Using Decision Tree Method by the Combination of C4-P4 and C4-A1 Channels of Scalp EEG." IEEE Access. 2019; 7: 102542–102553.
- MB Bin Heyat, et al. "Progress in Detection of Insomnia Sleep Disorder: A Comprehensive Review." Curr. Drug Targets. 2020; 22: 672–684.
- Y Muaad, S Raza, MB Bin Heyat, A Alabrah and J Hanumanthappa. "An Intelligent COVID-19-Related Arabic Text Detection Framework Based on Transfer Learning Using Context Representation." Int. J. Intell. Syst. 2024; 2024: 1–15.
- P Karmakar and S Das. "Al-powered computational analysis of dynamic responses in a vibrating Riga sensor within a reactive platinum -cerium oxidewater mixture." Sensors Actuators A Phys. 2025; 381: 116028.

- 11. SABagloee, M Heshmati, H Dia, H Ghaderi, C Pettit and M Asadi. "Blockchain: The operating system of smart cities." Cities. 2021; 112: 103104.
- 12. P Langer, S Altmüller, E Fleisch and F Barata. "CLAID: Closing the Loop on Al & Data Collection — A cross-platform transparent computing middleware framework for smart edge-cloud and digital biomarker applications." Futur. Gener. Comput. Syst. 2024; 159: 505–521.
- Bhowmik, M Sannigrahi, D Chowdhury, A Dey and SS Gill. "CloudAlSim: A toolkit for modelling and simulation of modern applications in Al-driven cloud computing environments." BenchCouncil Trans. Benchmarks, Stand. Eval. 2023; 3: 100150.
- 14. DQ Phan and HQT Ngo. "Implementation of multiple controllers for contextinspired collaboration between human and robot by integrating the uni-axial motion and real-time operating system." Internet of Things. 2023; 22: 100788.
- M Schmitt. "Securing the digital world: Protecting smart infrastructures and digital industries with artificial intelligence (AI)-enabled malware and intrusion detection." J. Ind. Inf. Integr. 2023; 36: 100520.