PROBLEMS AND MODERN TRENDS IN COMPUTING ENGINEERING

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Annotation

This article studies and analyzes information about the problems and current trends in computer technology. In particular, in the technological landscape, computers and computing technologies cover various aspects of our lives, modern computing techniques and trends in computer technology and their problems are studied. The issues of using computer technology in the production of programs and the creation of their mathematical models have also been studied.

Key words: Computing, computer technology, artificial intelligence, machine learning, software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS), procedural computing.

In today's rapidly evolving technological landscape, computers and computing technologies play an important role in shaping many aspects of our lives, from communication, business, health and entertainment to entertainment. The relentless pace of innovation in computing continues to bring new technologies, applications, and opportunities that simultaneously pose significant challenges. This invites us to comprehensively analyze modern computer technologies and computing techniques, to study their development trends, problems and prospects.

Development trends: One of the significant trends in modern computing and computer technology is the development of artificial intelligence (SI) and machine learning (ML) algorithms. These technologies have revolutionized many fields, allowing computers to perform complex tasks such as natural language processing, image recognition, and data analysis with unprecedented accuracy and efficiency. The integration of artificial intelligence and machine learning into a variety of applications, including virtual assistants, autonomous vehicles, and predictive analytics, has led to innovation and industry transformation.

Another notable trend in this area is the proliferation of cloud computing technologies. Cloud computing offers businesses and individuals scalable and on-demand access to computing resources that allow them to store data, run applications, and perform computing tasks without the need for extensive hardware infrastructure. The introduction of cloud computing has become the basis for the development of new software-as-a-service (SaaS), platform-as-a-service (PaaS) and infrastructure-as-a-service (IaaS) solutions that have enabled cost savings. For organizations of all sizes, flexibility and scalability have become an easy solution based on this technology.

In addition, the emergence of peripheral computing has created an important trend in modern computing technology. Peripheral computing involved processing data coming from sources such as IoT devices, sensors, and mobile devices closer to the source of production, rather than relying solely on centralized data centers. This approach is ideal for developing applications that require real-time processing and analysis of data streams while providing lower latency, reduced bandwidth usage, and increased privacy and security.

In the development of computer programs, one of the promising ways to achieve high real performance of the computer system is to adapt the architecture of the computer system to the structure of the problem being solved and to provide a special computer device that effectively implements the calculation algorithm. Many practical problems require the integration of serial and parallel computing parts into a single computing scheme for efficient implementation of systematic and procedural computations.

Usually, software developers solve this problem with a hybrid organization of calculations, by creating computing systems that include computing nodes of different architectures, combined with data transfer channels, and allow systematic, procedural calculations to be carried out in a single computing scheme. they say it can be done.

Despite the above trends and great achievements in modern computing and computer technologies, a number of problems still remain to be solved. One of the main challenges is cyber security threats and security vulnerabilities. As dependence on interconnected computing systems increases, the risk of cyberattacks, data leaks, and malicious activity increases exponentially. Addressing cyber security challenges requires the development of strong security measures, encryption methods, threat detection systems, and user notification programs to protect sensitive information and ensure data integrity and confidentiality.

Another problem that is waiting to be solved is the moral (ethical, cultural) and social consequences of automation of artificial intelligence and computing techniques and systems. As artificial intelligence technologies become widespread in various industries and human social

life, obsolescence, algorithmic confusion, invasion of privacy and independent decision-making lead to various problems and concerns. Develop programs that include ethical frameworks, rules, and guidelines to ensure the responsible development, implementation, and use of artificial intelligence systems, and to balance innovation with ethical standards, information culture, and societal impact. exit is required.

In addition, the digital divide between computing and software remains a major challenge, as there are disparities in computing and computer technology access, Internet access, and digital literacy among different populations and regions. Bridging the digital divide requires investment in infrastructure, education and digital inclusion initiatives that ensure equitable access to computing and computing technologies and enable individuals and communities to fully participate in digital activities.

Despite the challenges, modern computer technology offers promising plans for the future. For example, advances in quantum computing are expected to increase computing power, drug discovery using cryptography, artificial intelligence, and optimization problems that are currently difficult for classical computers. Quantum computing is opening new frontiers in science, engineering, and computing, spurring innovation and discovery in a variety of fields.

In addition, the integration of blockchain technology into computing systems has opened up new opportunities for secure, transparent, and decentralized applications. Blockchain has a fundamentally different impact than cryptocurrencies, enabling secure transactions, digital identity management, supply chain tracking, and decentralized finance solutions. As blockchain evolves, it is expected to transform industries, disrupt traditional business models, and create new opportunities for innovation and collaboration.

In conclusion, it can be said that the analysis of modern computing technologies should fulfill multifaceted tasks covering technical, ethical, social and environmental aspects. By exploring these challenges and engaging in informed dialogue, we must better understand the opportunities and challenges presented by technology, and strive to harness its transformative potential for the betterment of humanity and our planet. By continuously learning, adapting and collaborating, we can shape a future where technology is a force for positive change and empowerment for all.

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