Application of artificial intelligence in mechanical design, manufacturing and automation

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Abstract: in the context of today's information age, the development of science and technology has achieved new breakthroughs, and artificial intelligence is the latest product of modern science and technology, which can be applied at all levels of the social field, so as to promote the progress and development of society. Especially in the field of industrial manufacturing, the application of artificial intelligence has become more extensive, and has played a very good effect. For example, in the field of mechanical design, manufacturing and automation, many enterprises have started to carry out manufacturing and production through artificial intelligence, making the workshop work more efficient. The research on the application of artificial intelligence in mechanical design, manufacturing and automation can help to find a better application mode of artificial intelligence, so as to further play the effectiveness of artificial intelligence and promote the effective development of China's social economy.

Key words: artificial intelligence; Mechanical design and automation; Science and technology

The application of artificial intelligence in mechanical design, manufacturing and automation is the trend of social development, because human society is gradually developing in the direction of refinement, automation and intelligence. Only in this way can we manufacture high-precision related devices and parts and meet the needs of scientific and Technological Development. In addition, the progress of human society has greatly improved the demand in various fields, including the quality and price of products. The application of artificial intelligence can help enterprises produce high-quality products with good quality and low price, and realize rapid production while ensuring quality. Therefore, people need to pay attention to the application of artificial intelligence in mechanical design, manufacturing and automation, and formulate reasonable application strategies according to the advantages of relevant artificial intelligence and the content of mechanical design, manufacturing and automation, so as to promote the development and progress of human society.

1 Concept of artificial intelligence

Labor can only be an important part of computer technology, and it is also a typical representative of computer technology in the field of production and manufacturing. Artificial intelligence is based on people's effective understanding of the concept of intelligence, and effectively combines human consciousness and thought to simulate and manufacture artificial intelligence machinery. In essence, artificial intelligence is a comprehensive science and technology, which includes virtual reality, speech recognition and many other aspects. It can be said that the future development of artificial intelligence is very broad. But when artificial intelligence just appeared, its application scope and direction were relatively narrow. However, with the continuous in-depth research and development of artificial intelligence, its functionality is becoming stronger and stronger, and the scope of its application is gradually expanding. Especially at present, human society has started to apply AI technology on a large scale and achieved effective application results, but there are still some application deficiencies that need to be adjusted, so as to better play the effect of AI and promote the development of human society.

2 Characteristics and advantages of mechanical design, manufacturing and automation

1. Characteristics of mechanical design, manufacturing and automation

There are two main characteristics of mechanical design, manufacturing and automation, which are automation and artificial intelligence. Compared with the traditional mechanical production mode, modern mechanized production is not a simple combination of related technologies, but an effective integration of information technology and artificial intelligence technology, and then a comprehensive and in-depth optimization and transformation of the mechanized process, so as to improve the production efficiency and quality of the equipment. Moreover, the development and update of artificial intelligence technology and automation are complementary. Only by effectively combining the two can we maximize the efficiency of modern mechanical design and manufacturing, enable China's manufacturing industry and mechanical design industry to get better development, and promote China's social and economic progress.

2. Advantages of mechanical design, manufacturing and automation

(1) improvement of automation

Compared with traditional mechanical design and manufacturing, one of the main advantages of modern mechanical production is the effective improvement of the degree of automation. When the degree of automation of mechanical production is improved, it can promote the development of modern mechanical society and manufacturing industry in the future, so as to produce products with better quality and obtain a broader market. At the same time, the improvement of the degree of automation has greatly saved the labor cost of the enterprise, controlled the quality of products in a precise range, and prevented large errors due to manual work. In addition, the improvement of the degree of automation and manufacturing, especially some external environmental and climatic factors, so that the mechanical production and manufacturing can be completed under adverse conditions to realize the rapid manufacturing of products. For the traditional machinery manufacturing, the automation of mechanical design and

manufacturing has gradually reduced the potential safety hazards and construction costs, which has played a good role in promoting the development of China's machinery manufacturing field.

(2) improve work efficiency

Compared with the traditional mechanical design and manufacturing, the biggest advantage of mechanical design and manufacturing and automation is that it can self inspect and self repair, and does not need to spend a lot of manpower on the unified inspection and repair of machinery. In particular, modern machines can conduct a comprehensive inspection of the machinery through their own inspection system before use to prevent the occurrence of corresponding hidden dangers that affect the normal operation of the machinery. Not only that, modern machines can also automatically convert the working mode according to their own working conditions, and will automatically check and repair in case of failure. This situation will reduce the labor intensity of machinery, greatly reduce the shutdown rate, greatly shorten the maintenance time, and play a good role in improving work efficiency and maintaining machinery safety.

(3) wide range of applications

The application scope of mechanical automation is expanding with the continuous development of society, especially the continuous expansion of China's domestic automation market, which promotes the development of mechanical design and manufacturing and automation. It has a wide range of applications and has broad prospects for future development. It can replace more manual work to complete it automatically. In this way, it can free human hands and brain to complete more high-tech tasks, which is very helpful to promote the development of human society.

3 Application of artificial intelligence in mechanical design, manufacturing and automation

1. Application in fault diagnosis

The whole process of mechanical design and manufacturing involves a wide range, especially the use of mathematical models and data. In the process of mechanical design and manufacturing, it is supported by many aspects. While the traditional mechanical design and manufacturing methods are completed by hand, the biggest hidden trouble of this method is that it is prone to human error, which eventually leads to the deviation of the final effect of mechanical design and manufacturing, affecting the product quality. The application of labor can only be used in mechanical design and manufacturing and automation, which can effectively summarize and classify the relevant information of mechanical design and manufacturing, and make accurate settlement, and ultimately ensure the calculation accuracy in a more accurate range. Moreover, the application of artificial intelligence in mechanical design, manufacturing and automation can reduce mechanical failures caused by human factors and ensure the operation degree of machinery. Moreover, through artificial intelligence technology, the whole process of mechanical design, manufacturing and automation can be diagnosed, especially the relevant data in the mechanical processing process can be analyzed, and then the processing information of mechanical design and manufacturing.

2. Application in mechanical design and manufacture

Artificial intelligence system can carry out accurate reasoning for relevant data, analyze through language and relevant subject knowledge, and then can effectively improve the original fuzzy reasoning system. The application of artificial intelligence technology in the field of mechanical design and manufacturing can accurately analyze the relevant data in the process of mechanical design and manufacturing, and quickly classify and process the relevant information, providing the most accurate data for mechanical production. Moreover, in the process of mechanical manufacturing, it is necessary to combine related products and technology, and to achieve this goal, it is necessary to reasonably classify the related resources, so as to ensure the efficiency and quality of mechanical manufacturing. In addition to the above two applications, there are many applications of AI in mechanical design and manufacturing process in combination with the design method, so that the problems in the mechanical manufacturing process can be found and solved. In addition, the artificial intelligence system can build relevant resource sharing centers to precisely monitor the mechanical manufacturing situation, so as to carry out data processing and analysis, so as to formulate relevant improvement measures to improve work efficiency. Finally, the artificial intelligence system can input and store all the production and manufacturing data in its own control module into the system, so that in the process of mechanical design and production, it can read the relevant products to adjust the manufacturing process, and finally reach the production standard.

3. Application in data panel

In the current process of mechanical design, manufacturing and automation, the communication between people and the data system is completed through the data panel. Therefore, the quality and function of the data panel will affect the process of mechanical design, manufacturing and automation. Artificial intelligence technology can also be applied in the data panel, which has a good effect on optimizing the data panel. The application of artificial intelligence technology in the data panel can humanize the user interface, and people can use scientific computing visualization technology to broaden the way of information communication, so that the data panel is no longer limited to simple language communication, but also can carry out visual communication through relevant images and animation. In addition, AI technology can effectively integrate virtual reality technology and visualization technology, making the use of data panel more extensive. Therefore, the application of artificial intelligence technology in the data panel can also improve the efficiency of mechanical design and manufacturing and automation, and contribute to the development and progress of China's social economy.

4 Future development trend of mechanical design, manufacturing and automation

1. Effective combination with artificial intelligence

At present, the development of mechanical design, manufacturing and automation technology in China has become one of the main directions of scientific research, especially through the organic integration of intelligent, green and mechatronics, which makes the effective development of mechanical design, manufacturing and automation technology in China. However, in the actual application process, the knowledge of the main application of mechanical design and manufacturing and automation technology is still biased towards microelectronics, machinery and electricity, so as to meet the needs of the comprehensive development of society and realize continuous reform, so as to meet the needs of modern design and production. But for artificial intelligence technology, it is more important to upgrade automation, so that all mechanical equipment can meet human needs, and gradually enhance the stability of the system in the process, so as to ensure the sustainable development of the system. Therefore, the future development trend of mechanical design, manufacturing and automation is the effective combination with artificial intelligence technology, so as to better improve the degree of automation and promote the progress and development of China's mechanical manufacturing field.

2. Focus on reliability and safety

At present, China's mechanical design and manufacturing and automation products can constantly change in a dynamic environment, and adjust the mechanical structure through their own needs. The application of artificial intelligence technology in mechanical design and manufacturing and automation process can ensure that the production process becomes more safe and reliable. Especially in the process of information output and input, artificial intelligence technology can be used to make the product more compatible with user needs, and make the production process more safe and complete. In the current automated operating system, the transmission of information is no longer completed by individual subjectivity, but through intelligence technology in the mechanical design and automation process can sort out and analyze the relevant data information and provide rich data support for the development of the company. It can be seen that the future development trend of mechanical design, manufacturing and automation is towards reliability and safety.

3. Reduce related resource consumption

One of the original purposes of mechanical design, manufacturing and automation is to reduce the consumption of various resources and obtain the maximum benefits with the minimum investment. The integration of artificial intelligence technology, mechanical design and manufacturing and automation can help machinery to carry out dynamic control in the face of environmental changes, so as to reduce errors in artificial manufacturing and ensure safety and stability. Artificial intelligence technology can combine different machines on a large scale to form a good automatic production line, reduce the related labor costs, shorten the product development cycle and reduce production consumption.

In a word, artificial intelligence has a wide range of applications in mechanical design, manufacturing and automation, and its role is even more important. Whether for the improvement of work efficiency or the safety and reliability of mechanical design and manufacturing, it can promote the development of China's machinery manufacturing industry and bring more benefits to China. Therefore, according to the application of artificial intelligence in mechanical design, manufacturing and automation, we can find the relevant development trend, so as to provide relevant references for the development of mechanical design, manufacturing and automation in China, and help the development and progress of social economy in China.

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