Key technologies and development trends of intelligent manufacturing and robot application

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Abstract: In recent years, the overall development status of artificial intelligence in China is relatively good, and it has received extensive attention and attention from people from all walks of life. In particular, reviewing the history of the entire smart manufacturing industry, China's overall development in this field is very fast, but there are still many aspects that need to be reformed and innovated. Therefore, this paper analyzes the key technologies of intelligent manufacturing and robot application, and predicts its future development trend, which is of substantial significance to the future sustainable development of the industry.

1. Introduction
The continuous advancement and rapid development of science and technology can play a good role in promoting the development of many fields in China. Although China has not been very high in science and technology for a long time, it has been almost crushed by other countries. However, in recent years, with the great efforts of our martyrs in China, China has been in many fields such as manufacturing industry and scientific and technological innovation. China can achieve stable development. Only by ensuring the advanced nature of technology can we realize the rational use of technology in many fields.

2. Key technical analysis of intelligent manufacturing and robot application
With the rapid development of the economy, the overall development momentum of science and technology in China is generally relatively good, and has been valued by various industries. In the process of reform and innovation in many fields, reasonable introductions of various types of new technologies and methods will be carried out. Utilization. At present, China has very high enthusiasm and initiative in realizing intelligent manufacturing. Among them, whether it is the government or the enterprise, the participation enthusiasm in it is generally high[1]. In this large environment background, how Taking targeted measures, constructing and implementing a digital workshop that meets the actual requirements, and realizing the effective implementation of intelligent manufacturing, has a very important role in practice.

2.1 Robotics
At this stage, China has entered the era of intelligence and informationization in an all-round way. Therefore, at this stage, it is necessary to actively adopt targeted measures to realize and develop automated and digital technologies in light of actual conditions. In practice, in order to ensure that these advanced technologies can be effectively implemented, it is necessary to realize the importance of the application of robotics.
2.2 Artificial Intelligence Technology
Intelligent manufacturing mainly means that in practice, it is necessary to take targeted measures in combination with actual requirements to achieve an effective combination of intelligent technology and manufacturing technology. Through the scientific and rational use of intelligent technology in practice, it can be targeted at manufacturing. The existing problems are analyzed and researched[2]. That is to say, intelligent manufacturing can be regarded as a way of expressing and utilizing artificial intelligence technology scientifically and reasonably, and it is very important for the future development of the manufacturing industry. Important influences and effects.

2.3 Digital technology and network technology
As we all know, China has now fully entered the Internet era, and various types of new technologies have been rationally applied to practice and are reflected in all aspects. For the manufacturing industry, the product design technology of the manufacturing industry itself or some of the most basic technical means have a very important impact and role. In addition, it is also possible to take targeted measures in combination with actual requirements to ensure that the role and value of digital technology and network technology in the actual application process can be maximized.

With the development of the economy, more and more new technologies have been developed and utilized, which are reflected in many fields. This also means that the overall development of China is relatively good. At the same time, intelligent manufacturing has gradually become the current high-end equipment manufacturing. The foundation of the industry in the development process is also an indispensable part of it. In the development of intelligent manufacturing, the scientific and rational use of digital workshops and industrial robots is not only a very important part, but also Main content. In practice, it is necessary to take targeted measures in combination with actual requirements to ensure that the scope of promotion of robots can be increased, so that not only can the entire intelligent level of the robot be effectively improved, but also it can replace the artificial labor[3] in practice. The digital workshop has been proposed very early. The first is that the robot is still artificial, and then after combining with the actual situation, it is found that the machine can be automated, through automation equipment. Scientific and rational use can be transformed into mechanical equipment. Finally it is gradually moving toward the trend of integration, that is, in practice, through the rational use of complete sets of equipment, the realization of the assembly line, that is, a representation of intelligent exchange of numbers. The digitalization is mainly to digital technology in it. The main role of the full play, digital technology will produce a large amount of data in the development process, these data will involve many links and aspects, only by the targeted refinement of these data knowledge, can achieve intelligent development.

3. future development trend of robots
In the actual application process of robot technology, the technology was originally used in the range of the 1950s to 1960s. When combined with relevant literature and records, it was found that American scholar G-C-Devol was a person who expressed the possibility of using “universal robots” and the scholar also obtained the patent. At the same time, in 1960, the American AMF company clearly proposed the column-sitting robot in the daily operation and development process, in the actual application process, can achieve vertex analysis and trajectory control for various types of positions[4]. This is also the world's first robot that can be used in industrial production.

After long-term development and research, in order to promote the future development of robots, it is necessary to take targeted measures in light of the actual situation, and at the same time, objectively and reasonably judge and analyze the future development trend of robots.

First of all, in the future development of robots, more and more can effectively achieve the soft and hard mutual integration. Through the investigation and analysis of the actual situation, it is found that the importance of robot software in practice is more obvious. In the actual application process, intelligent technology is directly reflected in the software. The trajectory planning of the digital workshop must realize the effective combination of software and hardware, so that the application
value of the technology can be realized in practice. Therefore, in this context, if it is simply to develop and utilize hardware, it is not enough. It is necessary to introduce and hire a large number of professional and technical personnel to realize the development and utilization of software. In practice, in order to ensure the effective implementation of intelligent manufacturing in practice, it is necessary to combine practical requirements, but also actively take targeted measures to ensure that the staff have good mechanical knowledge and professional information technology skills, especially it is best for the staff to know how to control and manage the robot\cite{5}. Secondly, When the situation is combined and analyzed, it is found that in practice, the effective combination of virtual and real is realized. The robot does not exist in an isolated state in practice, but needs a lot of simulation and virtual reality to effectively combine with each other. Not only can the effect of the technology in the actual application process be ensured, but also the future development of the technology can be promoted. In addition, effective integration of human and machine is realized in practice. However, human-machine integration is still in the research stage, so it is necessary to In practice, combined with practical requirements, more in-depth analysis and research on human-machine integration.

4. Intelligent manufacturing and robot development trends

4.1 series robot to serial and hybrid robot

Through the investigation and analysis of the actual situation, it is found that the earliest robot technology in practice is basically connected in series. With the continuous operation and development of the current economic market, it can be based on the actual requirements of the market. For the tandem robot or the parallel robot, the targeted selection and utilization are carried out. In the practical application process, the series-parallel robot has its own stiffness characteristic requirements of the parallel mechanism, so the stiffness is relatively large and the space is also large\cite{6}. Because of its own certain advantages, it can be used as a basis when conducting structural research, which can also provide a certain direction for the application of robots as support and guidance.

4.2 rigid body robot to rigid body robot

At this stage, it is necessary not only to carry out targeted research and analysis on the rigid characteristics of the robot, but also to develop and utilize the robot with flexible features. For example, when analyzing and researching according to the contents of relevant literature, it is found that A British company has developed snake-type robots. At this stage, many schools in China are also increasing the research and development of various types of robots, such as octopus, snakes and other flexible robots, which can be regarded as the future. The first choice for the intelligent manufacturing industry is also the main development and application trend of robot technology in the future. Through the analysis of the current situation, it is found that in the future development process, for industrial robots, the softness will gradually become its The key features of the self. By means of the soft body, the end of the robot can be used in the running process, the body and so on can achieve flexible use characteristics. It can be seen that the accessibility and flexibility can be regarded as It is the most obvious advantage of the robot in the actual application process\cite{7}. For example, the construction and manufacture of the entire aviation industryIn the process, there are many holes that are deep. When these holes are processed, it is difficult to break into them if you use conventional methods. But if you use flexible robots, it is easy to effectively handle the problem.

4.3 Single robot operation to multi-machine robot work together

The collaborative work of multi-robots can be seen as the main trend in the current stage and in the future development process. When combined with the actual situation, the distribution of single-machine robots in the entire manufacturing space and the distribution of functions are found. In many respects, there are very serious limitations. It is in this context that it is necessary to achieve coordinated work through the rational use of multiple robots. In practice, if you want to have a digital, intelligent feature workshop For reasonable construction and utilization, it is absolutely impossible to
simply use a robot[8]. Especially in the implementation of some large-scale welding equipment, due to its very strong flexibility, it must be multiple Robots can work together to achieve each other. In this case, there are still many problems that have not been properly handled, so it needs to be summarized and analyzed in the future practice, so as to promote the future development of the robot. As shown in Figure 1.

Figure 1 Schematic diagram of multi-machine robot collaborative work

5. Conclusion
Although the current artificial intelligence technology and its implementation in practice have a very important impact on people's daily life and the development of various fields, artificial intelligence has only gradually emerged and developed in recent years. It can be seen that China can achieve steady development in the field of intelligent manufacturing and artificial intelligence, which has a very important impact on the continuous progress of China's science and technology and future economic development.

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