Applied Science and Innovative Research
ISSN 2474-4972 (Print) ISSN 2474-4980 (Online)
Vol. 7, No. 1, 2023
www.scholink.org/ojs/index.php/asir

Original Paper

Application Market of Industrial Robot in China

Liu Tao[1]

[1] School of Electrical and Information Engineering, Jiangsu University, Zhenjiang Jiangsu 212013, China

Received: February 10, 2023 Accepted: February 23, 2023 Online Published: February 27, 2023

doi:10.22158/asir.v7n1p77 URL: http://doi.org/10.22158/asir.v7n1p77

Abstract

Robotics is a programmable mechanical system with a certain autonomy that can exercise in its environment and complete some prescribed tasks. Although industrial robots are robots, they mainly provide duplicate, large quantities, and standard services. Therefore, they also have a certain standardized requirements for the materials and semi -finished products. In addition, because industrial robots are not intelligent enough, the processing of fuzzy range can only be operated according to procedures. For example, when the screen has a small bump, the robot may judge that it cannot be operated, but if it is artificially determined, it can continue to be processed and sold. Even if the development of machine vision can solve these problems to a certain extent, non -standardized operations will reduce efficiency accordingly. Industrial robots can not only achieve simple processes such as handling, but also technically some complex processes can be achieved. However, for the consideration of cost and benefits, most industrial robot manufacturers will not choose to produce such products. Because such demand is not large enough, and the profit margin is not considerable enough.

Keywords

industrial robots, challenges faced, development trends, Parallel robot

1. Introduction

In order to continuously improve the work efficiency of industrial robots and complete more work tasks at a high quality within a limited working time, it is necessary to scientifically plan the movement of the robot. Plan the movement path and order of the robot to shorten the movement path as much as possible without repeating. The planning trajectory is to minimize the range of space moving of the robot joint. Path planning is to help the robot solve all obstacles within the range of the route activity and minimize the distance between its route. Time planning is to add time information after the running trajectory and path planning, so that the robot can carry out various operations within the established time and according to the planned route, so as to control the speed of the robot's operation and maintain

the smoothness of its movement.

2. Development Environment of Industrial Robots in China

Flexible operation technology is mainly reflected in the use of robotic arms and robotics. In order to further demonstrate the application advantage of flexible operation technology, we should focus on research in perception, control, accuracy and other aspects, and use the flexible use of multi -functional sensors and independent joints to ensure that the flexible operation technology of industrial robots has human perception functions. The robotic arm with the useful and flexible power function, it can be released freely in actual application. It uses innovative drives to improve mechanical execution institutions and allow the accuracy of industrial robots to achieve new breakthroughs. Industrial robots can integrate internal information and environmental information and convert it into data information that is convenient for their own understanding and identification. To achieve the help of this goal without the help of sensors, under the action of diversified sensors, the perception and perception ability of industrial robots have been further improved, and they have visual perception capabilities. The visual perception function is implemented with the visual servo system as the core. The system feeds the visual information that the robot perceives to the relevant personnel. The staff can optimize and adjust its running status and position based on the state of the robot.

3. Features of Industrial Robots

The main manifestations of industrial robots in the industrial field are multi -joint robotics and multi -freedom mechanical devices. With the help of their own power, energy and control capabilities, they can automatically complete various mechanical product manufacturing, industrial processing and other production activities, industrial robots This characteristic shows its obvious advantages in the application of the electronics industry, logistics and chemical industry. After combining industrial robotics technology and industrial production, it can complete various operations according to the command. The application principle is mainly based on the support of computer technology. Through the corresponding design, it can simulate human brain, so that the robotic players make in accordance with various orders to make various orders. Activities similar to humans. In order to better play the advantages of industrial robotics technology, you need to understand the characteristics of industrial robots. In the process of manufacturing, industrial robots can be planned accordingly according to the production goals and the actual environment.

4. Intelligence of Industrial Robots

My country has become the world’s largest industrial robot market for many years. The domestic robot body manufacturing enterprise, core component manufacturing enterprises, and robot system integrators have risen rapidly. International robot giants have also increased their investment in the Chinese market and technology center. Although the Chinese industrial robot market is still dominated

by foreign brands, as domestic industrial robot manufacturers have achieved technological breakthroughs and recognition gradually increased, the market share of independent brand industrial robots is gradually increasing, and the gap between foreign brand robots has gradually narrowed; and China has also formed a relatively complete industrial robot industry chain, which has the independent production capacity of the entire industrial chain from upstream core components to midstream and midstream system manufacturing.

5. Challenges of Industrial Robots in China

Industrial robots themselves are not intelligent, and need to be smarter with a variety of sensors such as machine vision and even three -dimensional vision, as well as a variety of sensors such as force, tactile sensors, etc. to become more intelligent. In order to perform more complicated tasks, industrial robotic manufacturers are currently exploring the collaborative applications of industrial robots and machine vision, force perception and tactile sensors. At present, the types of collaborative robots are diverse. They include both single -arm collaboration robots, both arm collaboration robots, and composite collaborative robots. There are both collaboration between collaborative robots and collaboration between human -machines. Moreover, with the development of machine vision, intelligent sensing and other technologies, collaborative robots are moving towards the direction of intelligence. The box robot is one of the hot spots in the field of mobile robots. Since the box -type storage robot is a selection of cargo boxes instead of shelves, the characteristics of the box to the person can increase the storage density, save space, and save warehouse rent. Flexibility and compatibility are better, so it has also become the focus of the layout of various mainstream manufacturers.

The low localization rate of industrial robots has always been a problem facing the development of my country’s industrial robot industry. The application of domestic core parts is increasing. At present, the recognition and market share of domestic independent industrial machines are also increasing, and there is still huge room for improvement in the future. At present, industrial robots are still insufficient in terms of flexibility and intelligent decision -making capabilities. This is mainly manifested in weak perception ability. It can only perform various certainty tasks in a structured environment. Based on this, it can adapt to the complex dynamic environment and collaborate. Smart robots of the job came into being. At present, traditional industrial robots are intelligently applied to intelligent applications with sensors such as machine vision, power perception, and tactile sensor. Compared with traditional robots, cloud -based robots need to connect to the cloud control center of the network, a platform based on ultra -high computing capabilities, and real -time computing control of the manufacturing process through big data and artificial intelligence. In fact, now some manufacturers have begun to lay out on the robot and industrial robot cloud platform.

6. Transformation from Manufacturing to the Service Industry

The introduction of industrial robots will improve the efficiency of manufacturing relative to service business, and enhance the driving force for manufacturing enterprises to separate the service business. On the other hand, the introduction of industrial robots may further exacerbate the productivity gap between enterprises in different scale in the same industry. It can be inferred by the return result that industrial robots have promoted the transformation of the enterprise level from the manufacturing industry to the service industry, so that the number of employment industry employment has been increased in the statistically sense of the labor force without active cross -industry flow, reducing the employment of the manufacturing industry The number of people has increased the employment of the service industry for the manufacturing industry. Industrial robots have reduced the absolute scale of employment in the manufacturing industry, increased the absolute scale of employment in the service industry, and then promoted the employment share of the service industry for the manufacturing industry. Specifically, the increase in the density of industrial robots has increased the new level of labor in the service industry's relative manufacturing industry, and promoted the reorganization of labor among the industry. By promoting the labor force flow of other industries to the service industry, the absolute scale of employment in service industry has been increased. However, industrial robots have no significant impact on the outflow of labor in the individual of labor. Industrial robots have no significant promotion or inhibitory effect on the unemployment of manufacturing labor. The negative impact on the absolute scale of the employment of the manufacturing industry is mainly through the promotion of the enterprise level from the manufacturing industry to the service industry.

7. Conclusion

The Chinese mobile robot market has shown a strong development momentum, which is mainly due to the promotion of national policy and the expansion of applications to multi -industry. In the future, Chinese mobile robots will continue to maintain a rapid growth. In addition, overseas markets cannot be ignored. In the future, with the control of overseas epidemic and strengthening demand, it will also drive the development of Chinese mobile robot manufacturers. The market share of leading manufacturers in the industry will also further increase. Looking forward to the future, the development and application of China's industrial robotic industry before application. This is mainly due to the complete and huge scale of China's manufacturing industry, and the market potential for the transformation and upgrading of manufacturing is huge. At the same time, with the integration of emerging technologies such as artificial intelligence and robotics, it will also promote industrial robots to develop in a more intelligent direction.

References

Chen, C. C. (2019). Industrial Robot Industry: Current Situation, Industry Chain and Development Model Analysis. *Internet economy*, *46*(Z1), 33-38.

Liu Z. L., Xie, Y. Y., & Wang, D. (2022). Model Predictive Control of Grid-Connected Inverter Based on Exponentially Extended State Observer. *Science Discovery*, *10*(6).

Luo, M. Z., Fang, J., & Zhao, J. H. (2015). The development and application of industrial robot. *Machinery manufacturing and automation*, *1*, 1-4.

Sun, L. L., Jia, W., Jiang, Q., Shi, W. X., & Zhang, M. (2021). Research on Bi-objective Vehicle Routing Problem Considering Empty Loading Ratio. *Journal of Physics: Conference Series*, *2025*(1). https://doi.org/10.1088/1742-6596/2025/1/012020

Thor Morales Bieze, Alexandre Kruszewski, Bruno Carrez, & Christian Duriez. (2020). Design, implementation, and control of a deformable manipulator robot based on a compliant spine. *The International Journal of Robotics Research*, *39*(14). https://doi.org/10.1177/0278364920910487

Yang, H. L., Chen, L., Ma, Z. B., Chen, M. T., Zhong, Y., Deng, F., & Li, M. Z. (2021). Computer vision-based high-quality tea automatic plucking robot using Delta parallel manipulator. *Computers and Electronics in Agriculture*, *2021*, 181. https://doi.org/10.1016/j.compag.2020.105946

Zhang, H. X. (2013). Research on the development status and trend of industrial robot at home and abroad. *Electronic world*, *12*, 5-7.