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## Application of Industrial Robots in Stamping Automation Production Line

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ABSTRACT

Since the reform and opening up, China's economy has developed rapidly and the society has been continuously improving. At the same time, in order to facilitate people's travel, the automobile industry has emerged, which has brought great convenience to people's production and life, and has also promoted the progress of society. In recent years, automation technology has been continuously researched and developed by people, and it has been widely used in people's production and life. In order to improve the efficiency and modernization level of the automobile industry, the paper studies the application of industrial robots in the stamping automation production line, hoping to adapt to the new trend of economic development.

### 1. Introduction

In recent years, China's economic development level has been continuously improved, and many domestic undertakings have achieved many achievements. People's material living conditions and levels have also been continuously improved and improved, and the requirements for things in life have become higher and higher. At

the same time, with the advancement of industrialization and urbanization, China's automobile industry is developing rapidly. More and more private cars have brought great convenience to people's production and life. Therefore, the automobile industry needs to develop towards the modernization of high quality and light pollution in the new era. The paper focuses on the stamping automation production line in the automotive industry, and industrial

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robots into the automotive industry, while improving the industrialization, modernization and automation of the automotive industry, thus promoting the healthy development of China's automotive industry.

## 2. Overview of Industrial Robots

### 2.1 The Connotation and Development of Industrial Robots

As the name suggests, industrial robots are mainly mechanical devices for the industrial field. They have multi-joint or multi-degree-of-freedom robots that can do some work instead of humans. Relevant personnel can rely on the power and control capabilities of industrial robots themselves to carry out their work. They have many functions. Usually, they can accept human command, and can mainly operate according to pre-programmed procedures. With the continuous development of science and technology, the field of artificial intelligence has also made great achievements. At present, industrial robots can act according to some programs stipulated by artificial intelligence technology, which provides great convenience for people's production work.<sup>[1]</sup>

### 2.2 The Main Features of Industrial Robots

Industrial robots have four main features. First, industrial robots have programmability. Flexible start-up is a sign of further development of production automation. In different industrial productions, industrial robots need to perform different tasks, so their programmability can make them adapt to different industrial production work; second, industrial robots have anthropomorphic. According to procedures and instructions, industrial robots can make corresponding actions and work, and the same can be done as humans; third, versatility is one of the main features of industrial robots. Industrial robots can perform different tasks by replacing components such as robots; fourth, industrial robots are widely used and developed. The successful development and use of industrial robots is based on many science and technology.<sup>[2]</sup>

### 2.3 The Development Direction of Industrial Robots

With the continuous improvement of the development level of science and technology in China, industrial robots are gradually developing towards the direction of modernization. While the technology is constantly evolving, the various internal conditions are constantly changing. On the one hand, the technology of industrial robots continues to develop, and industrialization, precision, artificialization and intelligence are the main development directions and progress contents; on the other hand, the technology is constantly upgrading, and relevant personnel have continuously upgraded and applied the application technology of industrial robots, and finally promoted the continuous

development of industrial robots; in addition, the application fields of industrial robots have gradually become wider, and at the same time, the comprehensiveness of technology has been continuously enhanced.<sup>[3]</sup>

### 2.4 The Composition and Structure of Industrial Robots

The industrial robot is mainly composed of three parts: the main body, the control system and the drive system. The actuator and the base are the main parts of the industrial robot, mainly including the hand, arm and wrist of the robot. In addition, there is a robot and a running mechanism, and these actuators have a large degree of freedom of execution; the control system is to control the industrial robot. The relevant personnel input commands and programs into the control system to control the activities of the actuator and the drive mechanism. The drive mechanism is the meaning of the power mechanism, including the power unit and the transmission mechanism.

### 2.5 The Application and Development of Industrial Robots in China

Since the development in the 1970s, the development of industrial robots in China has been divided into three stages. The 1970s belonged to the germination stage of industrial robots.<sup>[4]</sup> The 1980s was its main development stage, and the 1990s was the application stage. Because China's industrial robots started late, although the current research and application of industrial robots have made many progress, there is still a big gap with developed countries. At the same time, the market share of industrial robots is mostly in other countries; China has not mastered the core technology of its development. Therefore, the development of industrial robots in China is still in the bottleneck period, but in recent years, it has gradually got rid of this dilemma, and technology is constantly breaking through and developing.<sup>[5]</sup>

## 3. Overview of the Application of Industrial Robots in Stamping Automation Production Line

### 3.1 The Connotation and Importance of Stamping Automation Production Line

The stamping automation production line is an important part of the current automotive industry in the production process, and has many advantages compared with the traditional manual production line. For example, it can greatly improve the efficiency of manual production line work, further improve its production efficiency, and it can greatly improve the accuracy and accuracy of production work, reduce errors, and minimize accidents. Usually, in the current industrial production, most of these stamping automated production lines are used for production. Only in this way will the automobile industry and the industrial modernization process be favored.<sup>[6]</sup>

### 3.2 The Role of Industrial Robots in Stamping Automation Production Line

Industrial robots are widely used in the stamping automation production line of the automotive industry and can play a big role. For example, the controllability of industrial robots enables them to be directly controlled by the staff and to carry out work for production. In this process, the impact of the external environment on the work can be minimized. At the same time, compared with manual production, it can greatly reduce the occurrence of accidents, and the loss of accidents is also small. The instructions and procedures can also successfully complete the handover work. In addition to the use of industrial robots can greatly reduce the cost of industrial production, while also improving the safety of industrial production.

### 3.3 Application of Industrial Robot Demolition System in Stamping Automation Production Line

In the production process of the automobile industry, automatic demolition is a necessary link or function for the normal operation of the stamping automated production line. In the automatic demolition system, including the demolition car, magnetic belt conveyor and automatic oiling device and other components, the demolition car usually stays in a fixed position to ensure the material loading and reclaiming,<sup>[7]</sup> this function can greatly reduce the reclaiming time of industrial robots, greatly improve the efficiency of industrial production, and promote the process of modern industrial production.

### 3.4 Application of Industrial Robot Control System in Stamping Automation Production Line

The control system is in an important position in the application of the stamping automation production line of industrial robots. Relevant personnel must ensure the normal operation of the control system. Only then can the industrial robots complete the interaction and cooperation between the various components, and finally complete the work tasks. In addition, some contents of the internal control system of the industrial robot have a great influence on the working performance of the stamping automation production line, and have a great effect on the improvement of flexibility.

### 3.5 Analysis of Safety Application of Industrial Robots in Stamping Automation Production Line

Relevant personnel should first ensure that the industrial robot can be used in the safety application of the stamping automation production line. Before the application, the components of the production line should be debugged, the problem of the production line should be avoided as much as possible, and the industrial robot should be programmed and controlled, which can adapt to the work of the stamping automation production line, safely carry out

the task of working place, and avoid safety accidents as much as possible.<sup>[8]</sup>

## 4. Conclusion

In summary, the author has carried out a comprehensive analysis of the article, the article on the application of industrial robots in the stamping automation production line as the main content of the narrative. On the one hand, the industrial robots are introduced in detail, including the meaning, development, characteristics, main directions, composition and structure and application development of industrial robots. On the other hand, it pointed out the application of industrial robots in the stamping automation production line, and clarified the importance of the stamping automation production line and the important role of industrial robots. At the same time, it also pointed out the application of the demolition system and control system of industrial robots, and finally analyzed its safety application problems, hoping to promote its continuous development and contribute to industrial modernization.

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