

DESIGN WORK TO IMPROVE THE EFFICIENCY OF INDUSTRIAL ROBOTS USED IN THE AUTOMOTIVE INDUSTRY**Mansurjon Rakhmatjonov Ma'rufjon o'g'li***PhD student of Andijan Machine-building institute**email: mr.rakhmatjonov@gmail.com*

Abstract: *This article was analyzed taking into account the tasks of design work to increase the efficiency of industrial robots used in the automotive industry, and the factors that affect their essence from a linguistic point of view to the reader's understanding. robots are currently used in many areas. In particular, various methods are used to further optimize the efficiency of industrial robots used in the automotive industry, in this article we are talking about consular work to increase the efficiency of industrial robots. [1]*

Keywords: *industrial robots, automotive industry, efficiency, improve, design work*

INTRODUCTION

Industrial robots are widely used in the automotive industry for various tasks: welding, painting, assembly and processing of materials. These robots are designed to work very repeatedly and accurately, increase efficiency and reduce human error. Some notable brands of industrial robots used in the automotive industry include ABB, Fanuc, KUKA and Yaskawa. *Industrial robots used in the automotive industry:*

1. The most common types of robots used in the automotive industry include articular robots, Cartesian robots, and SCARA robots. The pair includes several steam "frost" allowing movement in different directions, three linear arrows moving along the line at the Cartesian robots, and two parallel rotating pairs of "ins" allowing SCARA robots to move in circular motion.

2. Applications: Industrial robots will be used in the automotive industry for large-scale applications, including welding, painting, material processing, collection and quality control. For example, robots are used to trim car bodies from each other, process heavy parts in the process of accurate painting and assembly of cars.

3. Benefits: The use of industrial robots in the automotive industry provides a number of benefits, such as improved efficiency, improved quality and reduced labor costs. Robots will work faster and more accurately than humans, which will help speed up the production process and improve overall quality. In addition, robots can work in a dangerous environment without endangering human safety.

4. It is expected that in the coming years the use of industrial robots in the automotive industry will continue to develop advanced robots capable of performing more complex tasks. In addition, the use of artificial intelligence and machine learning is expected to improve the capabilities of industrial robots in the automotive industry.

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Collaborative robots: Collaborative robots, also known as cobots, are gaining popularity in the automotive industry. These robots are designed to work with humans and can perform tasks such as welding and assembly that require clarity and accuracy. Cobots are equipped with sensors and security features that allow you to work safely with people.

3D printing: 3D printing is used to create special tools and accessories for industrial robots in the automotive industry. These tools and equipment can be quickly developed and published, which will make it possible to produce and reduce costs faster. In addition, 3D printing can be used to create spare parts for robots, which will help reduce the cost of malfunction and maintenance.

Autonomous mobile robots are used in the automotive industry for material processing and logistics. These robots are equipped with sensors and cameras, which will allow you to move around the factory site and transport materials and parts between workstations. AMR helps to reduce the need for human labor and increase overall efficiency.

Cloud robotics is a new technology that allows robots to penetrate and process cloud data. This technology is used to improve the work and capabilities of industrial robots in the automotive industry. Cloud robotics will help improve the accuracy of robots, reduce their downtime and increase overall efficiency.

RESULT

Without fatigue and errors, robots can work faster and longer than humans. This can lead to increased productivity and efficiency in production processes. Robots can perform tasks with high accuracy and consistency, which reduces the likelihood of defects and errors in the production process. Robots can perform dangerous or duplicate tasks that can be dangerous for workers, which will improve overall safety in the workplace. While initial investments in robots can be large, they can lead to cost savings over time by reducing labor costs and improving efficiency. Industrial robots can be programmed to perform large-scale tasks, which can adapt them to the needs of multifaceted and variable production.

DISCUSS

Design work to improve the efficiency of industrial robots used in the automotive industry can include several stages. One approach is to optimize the robot and reduce rotation time and improve performance. This may include analyzing the robot's actions and identifying areas where improvements are possible, such as reducing the time to complete a task or minimizing the distance the robot travels. Another approach is to improve the accuracy and accuracy of the robot, which will help reduce errors and improve overall quality. This may include updating the robot's sensors and software, as well as accurate calibration and maintenance of the robot. Finally, work on the design may draw attention to improving the ergonomics of the robot's work environment, which will help reduce the risk of injury and improve the safety of employees. This can

include more convenient and ergonomic design of the robot workstation, as well as ensuring that the robot is integrated into the overall production process. *Designing industrial robots for the automotive industry requires careful consideration of various factors that may affect their effectiveness and functioning. Some ways to improve their effectiveness:*

1. **Optimizing path planning:** Robot path planning should be optimized to reduce the distance between two points. This can be achieved using algorithms that find the shortest path. By reducing the distance traveled, the robot can perform tasks faster and with less energy consumption.

2. **Using sensors** will help identify and correct errors in real time. This can improve accuracy and reduce the need for manual tuning, saving time and increasing efficiency. For example, sensors can recognize pulses in the robot state and adjust its trajectory accordingly.

3. **Use lightweight materials:** The use of lightweight materials in the construction of a robot will increase its speed and flexibility and perform tasks faster. This can be achieved using materials such as carbon fiber, aluminum or titanium. By reducing the weight of the robot, less energy is needed to move it, which will save time and reduce energy costs.

4. **Perform predicted maintenance:** Pre-maintenance includes data analysis and the use of machine learning as needed. This will help to avoid unexpected working hours and reduce the need for manual inspection and repair. By implementing a predictable technical service, the robot can become more efficient and less inoperative.

5. **The modular design** involves splitting the robot into smaller, replaceable parts. This will help reduce downtime and increase efficiency, allowing you to quickly and easily replace incorrect or outdated parts. In addition, modular design can make it easier to adapt the robot to specific tasks or environments.

CONCLUSION

Designing industrial robots for the automotive industry requires a complete understanding of the specific needs and challenges of the industry. By improving efficiency, these robots will help manufacturers reduce costs and increase efficiency. Some important aspects of the design include optimizing the robot's manual capability, speed and carrying capacity, as well as advanced sensors and controls to improve safety and accuracy. In general, continuous innovation and improved robot design will help the automotive industry achieve efficiency and competitiveness goals.

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