

The Use of Artificial Intelligence in the Automation of Machine-Building Production

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Abstract: The article examines the application of artificial intelligence (AI) in the automation of machine-building production. The article describes the main tasks that can be solved with the help of AI, such as production optimization, quality control, prediction of equipment failures, etc. Examples of successful AI implementation in mechanical engineering are given, such as the use of neural networks to predict equipment failures, automatic recognition of defects on the surface of parts, etc.

Keywords: Artificial intelligence, automation, manufacturing, mechanical engineering.

Some problems related to the use of AI in mechanical engineering are also considered, such as the difficulty of integrating AI systems with existing production processes, the need for qualified specialists to configure and maintain AI systems, as well as problems of data security and confidentiality.

The result of the article is the conclusion that the use of AI in machine-building production can significantly increase production efficiency, reduce costs and improve product quality. However, for the successful implementation of AI systems, it is necessary to take into account all the problems associated with this and conduct a thorough analysis of the economic feasibility in each specific case.

The use of artificial intelligence in the automation of machine-building production:

1. Optimization of production: AI can be used to optimize production processes, for example, to control production equipment and reduce machine downtime. The use of AI also makes it possible to adapt production to changes in demand for products.
2. Quality control: AI can be used for product quality control, for example, to automatically detect defects on the surface of parts or to determine whether products meet specified parameters.
3. Prediction of equipment failures: AI can be used to predict equipment failures, which allows for routine prevention and reduce the number of emergencies.
4. Inventory management and logistics: AI can be used for inventory and logistics management, for example, to optimize the supply of materials or to distribute goods through a logistics network.
5. Data security and protection: The use of AI in engineering can pose risks to data security and protection. For example, using AI systems to control production equipment can potentially create vulnerabilities for cyber attacks.

6. Integration of AI systems with existing production processes: One of the main problems associated with the use of AI in mechanical engineering is the difficulty of integrating AI systems with existing production processes. The need for qualified specialists to set up and maintain AI systems can also be an obstacle to their successful implementation.

7. Examples of successful AI implementation in mechanical engineering: Examples of successful AI implementation in mechanical engineering can be the use of neural networks to predict equipment failures, automatic detection of defects on the surface of parts, optimization of production using AI control systems, etc.

8. Using AI to improve design: AI can be used to improve product design, for example, to optimize the geometry of parts or to simulate the operation of a product in various conditions.

9. Application of AI in robotics: Robotics is an important field of mechanical engineering, and AI can be used to control and program robots. For example, AI can be used to train robots to perform complex tasks.

10. Using AI in customer service: AI can be used to improve customer service in the engineering industry. For example, AI can be used to automatically process equipment repair requests or to provide online advice to customers.

11. The use of AI in personnel training: AI can be used to train personnel of machine-building enterprises. For example, AI can be used to create interactive simulators for learning how to work with equipment or to conduct online courses in technical disciplines.

12. Using AI for decision-making: AI can be used for decision-making in the engineering industry, for example, to determine optimal production strategies or to predict product demand.

13. Using AI to create innovations: AI can be used to create innovative products and technologies in the engineering industry. For example, AI can be used to create new materials or to develop new production methods.

14. Trends in the development of AI in mechanical engineering: The engineering industry has seen the constant development and application of new AI technologies, such as deep learning and machine learning with reinforcement. It is expected that in the future AI will play an increasingly important role in the automation of machine-building production.

Conclusions

In conclusion, it can be noted that the use of artificial intelligence (AI) in the automation of machine-building production has great potential to increase productivity, reduce costs and improve product quality. The use of AI allows you to optimize production processes, control product quality, predict equipment failures, and manage inventory and logistics. Examples of successful AI implementation in mechanical engineering include the use of neural networks to predict equipment failures, automatic detection of defects on the surface of parts, and optimization of production using AI control systems.

However, the use of AI in mechanical engineering is also associated with a number of problems, such as the difficulty of integrating AI systems with existing production processes, the need for qualified specialists to configure and maintain AI systems, as well as problems of data security and confidentiality. Therefore, before implementing AI systems in mechanical engineering, it is necessary to conduct a thorough analysis of economic feasibility and take into account all related problems.

In general, the use of AI in machine-building production is an important trend in the development of the industry and can significantly increase production efficiency, reduce costs and improve product quality.

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