

# Application of Artificial Intelligence Technology in Electrical Automation Control

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**Abstract:** In recent years, China's science and technology have developed rapidly, artificial intelligence AI as a new type of science is developing day by day, China's modernization construction is progressing, artificial intelligence technology has been applied in various industries, and artificial intelligence technology has been used in electrical automation control to improve the efficiency of electrical automation control. Timely monitoring of electrical-related work equipment failures reduces human resource costs effectively saves labor, reduces time costs, and further promotes the development of electrical automation in China.

## 1. Significance of Artificial Intelligence Technology in Electrical Automation Control

In recent years, with the development of science and technology, the importance of artificial intelligence has become more and more obvious. Therefore, the country has also strengthened its research on the development of artificial intelligence. This technology requires a large number of disciplines to support it. In the process of design, a team with a high degree of integration is needed to overcome all difficulties. A multi-directional artificial intelligence development system is established. The application of artificial intelligence technology in electrical automation control can truly realize the automation of electrical control and give full play to the convenience and advantages brought by electrical automation [1].

### 1.1. Savings in Human Resources Costs

The traditional industrial production mode requires a large number of human resources to participate in the original electrical automation control process, although part of the operation control related work has been shared for the operator, but the related electrical equipment still needs the operator to carry on the inspection and the maintenance, therefore each work step is crucial, the slight carelessness will produce the production accident, and needs the professional, the related technical personnel, the engineer to carry on the supervision operation, carries on the maintenance regularly, once the electrical production equipment breakdown will affect the entire production work chain, affects the production efficiency, relative to the artificial intelligence technology, Electrical automation control technology is still relatively backward, development is not perfect, and there is no efficient saving of working time. The application of artificial intelligence technology in electrical automation control can effectively realize real electrical automation production without the participation of operators. Completely reduce the cost of human resources in the process of electrical automation control. The artificial intelligence electrical automation control can carry on the inspection in time and effectively, reduces the production equipment to delay the time limit rate because of the malfunction, effectively guarantees the electrical production work staff life safety, promoted the electrical production efficiency growth [2] .

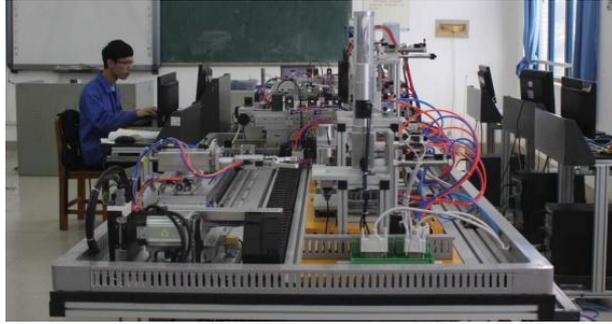


Figure 1 Artificial intelligence technology in electrical automation control

## **1.2. Increased Efficiency of Electrical Equipment Automation Control**

Artificial intelligence technology is inseparable from computer technology. Artificial intelligence technology relies on computer technology. In the production process, the output will be adjusted according to the actual situation. When the production plan increases, higher standards of electrical automation control technology are required. Some production staff are less responsible for their work content and are not responsible for their work content. In the data collection, the information input is not accurate and perfect. However, artificial intelligence technology can effectively reduce the obstacles caused by human factors, and quickly and accurately collect data related to electrical work equipment. And can timely and systematic preservation of relevant data and information, effectively reduce the probability of error in manual data collection, improve the control efficiency of electrical automation equipment and stability during operation, improve the quality of products, artificial intelligence technology can regularly repair electrical equipment, timely warning after fault detection, so that relevant staff timely maintenance, effectively strengthen the system stability effect of electrical automation control.

## **1.3. Electrical Automation Control Systems are More Sensitive**

In the original electrical automation control system, the control method, parameter setting and controller model requirements are high, and the cost is relatively high, there are many uncertain factors in the actual control, a little carelessness will directly affect the performance of the equipment. But after the introduction of artificial intelligence control technology, the traditional electrical automation control technology is effectively integrated, the overall innovation of electrical automation control is realized, and the convenience of production and later development is improved. Electrical automation control is the use of artificial intelligence technology, effectively ensure the sensitivity of electrical automation control system, can ensure, especially the use of intelligent technology, the traditional electrical automation control system more dynamic, become the development of modern electrical control system to provide the necessary help [3].

## **2. Application Strategy in Artificial Intelligence Technology in Electrical Automation Control**

### **2.1. Analysis During Instrument Application**

The configuration of electrical automatic control system is very troublesome, which involves many cross fields and links in the whole process. Because the electrical automatic control device is relatively complex and usually needs to complete multiple system sets together during operation, it is necessary for technicians to have the corresponding electrification operation ability, and it is necessary to have enough solid theoretical knowledge and practical ability. In addition, the electrical automation control process is strictly monitored, and the corresponding standards should be followed in the specific operation process. By introducing AI technology, these problems can be solved quickly and effectively. Computer theory must be used when applying AI technology to enable the whole process of electrical automation control to be manipulated and completed by executing programs and code. Most of the traditional manual operations replace the automatic

control of electronic equipment, to some extent improve the quality and efficiency of equipment operation, but also greatly reduce the initial cost. Besides, the introduction of AI will improve the efficiency of automatic control of equipment and ensure the normal operation of system equipment [4].



Figure 2 Artificial intelligence technology in electrical automation control

## 2.2. Application in the Field of Control

In the application of electric automatic control, with the help of artificial intelligence technology, the existing standards and functions of electric automatic control are greatly improved, and the automatic control technology can work better according to the requirements and standards of program control. achieve effective utilization while minimizing operating costs. This is particularly evident in the reduction of human resources.

At the same time, in the field of automation and control of electrical equipment, the application field is relatively concentrated, among which there are two most commonly used: fuzzy control technology and expert system. In terms of fuzzy control, fuzzy control system based on fuzzy inference language system and other related content will be the control standard. in terms of specific reasoning ideas, in fuzzy control, controlled techniques rely on fuzzy reasoning. To ensure that the electrical automation control can achieve automatic operation. Fuzzy control mode is an adaptive feedback control system controlled by computer technology.

## 2.3. Application in Technology Regulation

In the process of electrical automatic control, the development of automatic monitoring is one of the main ways of artificial intelligence. Among them, engineers can use the computer intelligent monitoring system to supervise the whole automatic production process, can rely on artificial intelligence system to optimize the design of the production process in real time, and can further improve the stability and safety of the environment in automatic production. At the same time, it can also help to find the potential problems in the automatic production system in time, and effectively improve the overall level of the automatic production process.

## 2.4. Application in Conventional Operations

using neurons in powerful artificial intelligence and making accurate control over various automated production tasks, which is the effective application value of artificial intelligence technology in daily electrical operations. Among them, the organic unification of artificial intelligence technology and system operation can make automatic production more organic fusion in the whole process. This can not only avoid the error problem of manual operation in the past, but also can intelligently control all automatic production equipment. This condition can help to find the hidden trouble and quality problem of the equipment in time, and provide effective support for the reasonable maintenance of the equipment [5].

## 2.5. Application of System Failure Prevention

In the process of electrical automation system, the prevention of general system failure is also the main application point after the application of artificial intelligence technology. The system can

record and save the running parameters of all kinds of automatic production equipment for a long time, so as to provide the maintenance personnel with the most accurate fault location, shorten the maintenance time and ensure the continuous development of automatic production. At the same time, after the failure of the automation system, artificial intelligence technology can be used to perform on-line identification and system shutdown, on the other hand, it can reduce the loss caused by the accident, and it can also ensure that the fault In addition, the fault detection in the production equipment of electrical automation can use fuzzy theory to carry out effective and accurate fault detection, so as to find and analyze the cause of the fault according to the characteristics and conditions of the fault. Identify the cause of the failure and take appropriate troubleshooting measures to achieve the purpose of rapid troubleshooting [6].



Figure 3 Artificial intelligence technology in electrical automation control

### 3. Concluding Remarks

The development of electrical automation control technology from traditional manufacturing methods to computer technology and the popularization and application of information technology have brought great changes in manufacturing methods, while the technology of artificial intelligence is the combination of information technology and computer technology, and the maintenance of CNC machine tools is a relatively high-end maintenance technology. There are many kinds of faults in CNC machine tools. In fact, scientific research is applied in the process of mechanized production, and the use of artificial intelligence technology greatly improves the efficiency of production and ensures the quality and performance of products. To solve the problems in the practical application of artificial intelligence development in electrical automatic control in time also marks the maturity of artificial intelligence technology and the process of gradually improving artificial intelligence technology is also an important development process<sup>[7]</sup>.

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