Analysis of Application Thoughts of Artificial Intelligence Technology in Electrical Automation Control

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Abstract: With the continuous development of artificial intelligence technology in China, artificial intelligence technology is also widely used in electrical automation control activities. Through the application of artificial intelligence technology in power automation control, the automation control efficiency and control quality can be further improved, and the cost input for manpower and material resources in electrical control can be effectively reduced, thereby bringing good economic benefits application to the electrical equipment. This paper mainly explores and analyzes the application ideas of artificial intelligence technology in electrical automation control.

1. Introduction

Artificial intelligence technology can simulate human intelligence, and with the help of computer technology, the machine has good image analysis and processing, language recognition and other capabilities, and artificial intelligence technology can also be competent in some specific conditions. In recent years, with the continuous development of science and technology in China, some traditional control technologies are difficult to meet the automation control requirements of electrical production, and the application of artificial intelligence technology can achieve good manpower and material input cost control effects. And artificial intelligence technology can further improve the operational efficiency of electrical automation, and has a certain positive significance for the further development of China's power industry.

2. Artificial Intelligence Technology Related Theory

2.1 Overview of Artificial Intelligence Technology

Artificial intelligence technology is an emerging technology that has developed rapidly with modern science and technology, and has achieved good application effects in various fields of social development. The formation of artificial intelligence technology is a combination of computer technology, mathematics and introduction. It is based on human intelligence simulation and can replace people to do some complicated work. At present, in the research of artificial intelligence technology at home and abroad, most of the research focuses on the expert system and the robot system. In the early research process, because the human brain has the characteristics of precision and complexity, it is difficult to obtain good simulation results. With the continuous development of modern science and technology, the simulation of the human brain also provides enough technical support, which further enhances the application performance of artificial intelligence technology. By embedding the artificial intelligence technology into the simulation system, the simulation accuracy
and automation level can be further improved, and the labor cost in the simulation operation process can be effectively reduced, thereby bringing good economic benefits to the enterprise, artificial intelligence. The intersection of technology and simulation discipline is shown in Figure 1

![Figure 1: The intersection of artificial intelligence technology and simulation discipline](image)

### 2.2 Artificial Intelligence Technology Algorithm Analysis

With the continuous development of science and technology in China, the artificial intelligence control has also changed from conventional technology to artificial intelligence technology, and the effective control of the lines in the electrical system can be realized on the basis of the predetermined sequence. The starting procedure and transmission procedure for the electrical system and the brake program can also improve the control effect. As an electrical control algorithm commonly used in the electrical industry, PID algorithm has problems in the application process that are difficult to determine parameters, and it will cause great obstacles to the development of various debugging tasks. Through the application of artificial intelligence technology, it can also improve the PID algorithm, and can use the fuzzy control algorithm to control the electrical system, so that some parameters with relatively large errors can also have certain corrective effects. The application effect of the PID algorithm is further improved. When the PID algorithm is used to control the electrical system, P represents the proportional action data, I represents the integral action data, and D represents the calculus action data. In the process of calculating the specific parameters, if the calculation error occurs due to external factors, the artificial intelligence technology can be used to realize the effective adjustment of the parameters, so that the work effect can be further improved.

### 2.3 Characteristic Analysis

Compared with other types of controllers, the artificial intelligence controller does not need to carry out the construction of the control object model in the design process, and can form a good supervisory function and an unsupervised function, thereby further improving the operation effect of the system. Upgrade. The improved supervision function can further optimize the structure of the artificial intelligence controller and calculate the time effectively. The non-supervised function can improve the learning process of the controller, thereby forming a computer system of nerves and fuzzy nerves, and promoting the positive effects of the control algorithm to the maximum extent. First, a nonlinear function mode can be formed, and then the performance of the artificial intelligence controller can be maximized by means of appropriate control operations. In addition, on the basis of improving data adaptability, the orderly development of different information configuration work is...
required, and the function of the artificial intelligence controller is broadened to ensure that all aspects of the work can fully meet the current development needs of the times. [3].

3. Current Status of Artificial Intelligence Application in Electrical Automation Control Work

Artificial intelligence can effectively collect, feedback, research and process information, and can replace some humans to complete some complicated mental work, thus helping enterprises to effectively solve the labor cost. In the electrical automation control system, through the reasonable application of artificial intelligence technology, it can also optimize the electrical production, circulation and exchange process, and promote the automation level of the production process, which can effectively improve the efficiency of electrical production, reduce labor cost investment, bring good economic benefits and social benefits to electrical enterprises.

The design of electrical equipment is a systematic and complex work. In addition to the theoretical knowledge of circuits and electromagnetic fields, some empirical knowledge of design is needed in the specific design process. In the traditional electrical equipment design process, the design is based on manual design, and the design results are difficult to meet the specific application requirements of the electrical system. When using computer technology to design electrical equipment, it can also greatly reduce the design and update cycle of electrical equipment, and can make a reasonable choice of the optimal design to ensure the operation of electrical equipment. Through the application of artificial intelligence technology in electrical automation control, the design efficiency and product quality of the product can be further improved [4].

In the electrical automation control system through the application of artificial intelligence technology, it also has good application advantages in the following aspects: ① Data acquisition and processing functions: through the application of artificial intelligence technology, can also achieve the switch of electrical equipment With the analog data collection work, the data processing and storage processing can also be realized under certain conditions. ② System operation monitoring and time alarm function: This function can not only realize the real-time monitoring of the analog value of the main equipment in the electrical system, but also can monitor the switching status of various devices, and in this system The accident alarms that are provided are limited, and alarms can be processed for events whose status has changed. In this system, it is also possible to automatically handle and prompt the handling of accidents, and has various functions such as sound and light, telephone alarm and graphics. ③ Operation control function: Through the application of artificial intelligence technology, it is also possible to realize the remote control of the circuit breaker and the electric disconnector by means of the Internet technology, and can realize the effective adjustment of the excitation current, so that the electric control system can be effectively implemented. Optimized processing to meet various management needs during the operation of the distribution network. In order to meet the needs of the operation of the system at all levels, the operating authority of the different operating personnel should be restricted in the operation control system. ④ Fault recording function: The fault recording function can perform effective recording of fault recording analog quantity and sequence, and can meet various requirements such as displacement and waveform capture of switching quantity.

4. Application of Artificial Intelligence Technology in Electrical Automation Control

In the actual operation process of the electrical automation control system, it is also necessary to use artificial intelligence technology to carry out various tasks reasonably, and it is necessary to carry out the preparation of perfect technical solutions. It is also necessary to make appropriate and reasonable adjustments for the work content of all aspects. Only in this way can the quality of the operation of the electrical control system can be met to meet the needs of the development of the power grid.

4.1 Application in Electrical Automation Equipment

Electrical automation equipment is also very important for the operation and development of control systems. Only when the rational application of artificial intelligence technology is applied can the application rationality of various electrical automation equipment be further improved to meet the
operation of electrical systems. Various needs. In the actual process, the application of artificial intelligence technology in electrical automation equipment needs to be analyzed, and the operation level of electrical automation equipment is further improved through the cross-integration mode of various disciplines. During the use of artificial intelligence technology, operators need to have good basic knowledge and technical level. Under the support of intelligent technology, they can also make positive changes in traditional working methods, and promote the operational efficiency and upgrade operational quality of electrical automation equipment.

4.2 Application in Electrical Control Work
In order to obtain good electrical control effects, it is necessary to actively select advanced artificial intelligence technology, take the electrical system as the core part, and continuously improve the application effect of artificial intelligence technology based on the development of technology. In order to complete the automation management tasks of various electrical control, it also requires relevant operators to actively apply artificial intelligence technology to operate and process in daily work. On this basis, the transformation and improvement of the entire electrical control system can be realized. On the basis of electrical work efficiency and work quality, it has a good optimization effect on the existing electrical control working mechanism and promotes the sustainable and stable development of China's power industry [5].

4.3 Application Measures During Electrical Fault Diagnosis
In the process of electrical fault diagnosis, based on the application mode of artificial intelligence technology, the reasonable preparation of the fault diagnosis technical solution can further improve the rationality of fault diagnosis and processing, and promote the fault diagnosis level of the electrical control system. Get further improvements. During the fault diagnosis, the technical knowledge of the neural network, the expert and the fuzzy theory should be used reasonably, so that the diagnosis effect of the electrical fault can be continuously improved, and the fault existing in the operation of the electrical system can also be performed. Timely and effective processing to improve the operational reliability of the electrical system. During the fault diagnosis, the active application of artificial intelligence technology can be carried out in the fault-prone areas such as the engine, large motor and transformer. Then, based on the characteristics of the production activities, the fault problem can be discovered and processed in time to ensure the normality running of the power system. Therefore, all power companies need to constantly change the traditional backward power failure diagnosis mode. Based on the application effect of the electrical function technology, the detection steps and procedures are continuously improved and optimized, and the fault detection accuracy is further improved. Only by fully exerting the effectiveness of artificial intelligence technology can we obtain good fault analysis and processing effects and achieve the expected electrical fault handling objectives.

5. Daily Operation of Electrical Equipment
In order to obtain good daily operation results of electrical equipment, it is also necessary to carry out rational use of artificial intelligence technology, and promote the development of existing electrical system management mechanism in the direction of scientific and modernization, which can also ensure the effective management of electrical equipment. Implementation. In the daily operation and management process of electrical equipment, the application of artificial intelligence technology can also simplify and optimize the daily operation process to ensure the rational operation of the power system. Therefore, all power companies also need to build research mechanisms for artificial intelligence technology, and need to continuously strengthen the application level and management of artificial intelligence technology, realize automatic collection and effective management of equipment operation data information, upgrade and promote the work efficiency of electrical equipment to meet the development needs of the electrical industry.
6. Application in the Production Line
Artificial intelligence technology has a very important application significance in the electrical automation production line. It can also complete a series of power production tasks based on the combination of the electrical automation control system and the production line. It can also make a very large promotion to the further improvement and optimization of the electrical automation production line system. All power companies also need to create analog controllers, and artificially integrate artificial intelligence technology and automated production knowledge in electrical production lines. On this basis, artificial intelligence technology application mechanisms and patterns are rationally created. It can be said that artificial intelligence technology has a good application prospect in electrical automation systems. Various electrical companies can also organically integrate neural networks with expert systems, and then incorporate fuzzy theory technology to develop various electrical production and management technologies and strengthen work to promote the further development of China's power industry.

7. Conclusion
In summary, the application of artificial intelligence technology in electrical automation control can also promote the operation quality and control efficiency of electrical automation equipment to be further improved, and can also optimize the existing electrical control and production theory. To promote the level of automation control, and bring good economic and social benefits to electrical enterprises.

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