

Application research of artificial intelligence technology in electronic engineering automation control

Enpu Zhang

Luoyang No. 8 Senior High School, Luoyang, Henan, 471023, China

Abstract: *In the process of continuous development of computer technology, a technology with similar functions to the human brain came into being, namely artificial intelligence technology. At present, this technology has been effectively applied in many fields, and its main function is to carry out a series of intelligent operations by imitating human behavior and thought, so as to drive intelligent machinery to replace manual work mode, liberate labor force, and improve production efficiency. So it has more important application research value. Based on this, this paper takes artificial intelligence technology as the research object, and briefly discusses its application in electronic engineering automation control.*

Keywords: *Artificial intelligence technology; Electronic engineering automation control; Applied research*

1. Introduction

In the process of continuous social and economic development, people's living standards have been significantly improved, and the development speed of social productivity is also constantly improving, and all walks of life have achieved innovative development. As far as the field of electronic engineering is concerned, the current modern electromechanical operation mode has gradually replaced the previous industrial machinery operation mode, and is developing in the direction of intelligence. It can be seen that the application of artificial intelligence technology in it can not only improve the level of productivity, but also promote the improvement of the core competitiveness of enterprises, so it is necessary to conduct in-depth research on the application of artificial intelligence technology in the field of electronic engineering, so as to improve its automation control level and promote the good development of the industry.

2. The significance of artificial intelligence technology in electronic engineering automation control

Artificial intelligence is a new scientific industry technology, which not only involves the field of computer information technology, but also involves the two fields of natural science and social science. Simply put, artificial intelligence is a science and technology that imitates various ways of human behavior and ways of thinking through computer language programming, is a simple alternative to human wisdom, and is also the main direction and trend of future science and technology development. At this stage, the development level of artificial intelligence is limited to some simple image language recognition and natural language processing, in the future, driven by the rapid development of science and technology, I believe that artificial intelligence technology will also achieve a comprehensive processing of natural language, so that the scope of application of artificial intelligence technology will increase. Expert system is the core of electrical automation control. The application of artificial intelligence in the system has promoted the intelligence and automation level of electronic engineering automation control, and also improved the work efficiency of automatic control system, greatly reduced manual input, reduced unnecessary errors caused by manual operation, and improved the work quality of automatic control system.

Through the use of artificial intelligence technology in electronic engineering automation control, it not only realizes the improvement of the intelligence and modernization level of mechanical and electronic engineering, but also plays a good role in promoting the future development of the overall industry. As far as electronic engineering automation is concerned, it belongs to the engineering machinery class and is an engineering type that relies on modern technology for processing. In recent

years, the development of science and technology fields such as computer technology in China has also achieved phased results, providing more advanced theory and technical support for electronic engineering. On this basis, the use of artificial intelligence technology to carry out the related processing work of electronic engineering further improves the efficiency level of various types of production work, and can also reflect the important role of intelligent technology in many mechanized products. Such as driving simulation systems, airbags and ticket vending machines, etc., are all products of the new era of technology based on artificial intelligence technology. It can be seen that the integrated development of artificial intelligence technology and electronic engineering can not only effectively improve the level of automatic control of electronic engineering, but also play a leading role in promoting the innovation and development of mechanical engineering in China.

3. Application advantages and characteristics of artificial intelligence technology

3.1 Autonomous learning ability

Based on the development of modern science, the application of artificial intelligence technology in computers has formed a relatively complete and mature assistive technology system. Technology creation in the way of machine research and development can simulate human activities, so as to improve the intelligence level of mechanical equipment. In the process of continuous development of artificial intelligence technology, it is also achieving continuous progress, compared with traditional technology, it has a better ability in self-learning, through the analysis and processing of a large number of data, it can establish a deep data analysis structure model to achieve learning behavior. In addition, artificial intelligence technology can analyze data information by simulating human thinking, and then make reasonable judgments, so as to provide people with valuable content. Browser is a representative technology product in this respect ^[1].

3.2 Data mining function

In the comprehensive analysis of all kinds of data information, artificial intelligence technology also shows a strong data mining function. By making use of the correlation between a large number of data and information, and using data association analysis and difference and evolution algorithms, the data correlation is transformed into valuable data and provided to people as reference information. Therefore, relying on this advantage of artificial intelligence technology, it can show a higher level of data integration in practical application, so as to provide users with information with a higher degree of matching according to their needs, and improve the efficiency of information retrieval.

3.3 Data information processing

In the current information age, people's lives and work are often filled with massive data information. If these data cannot be classified, it is difficult to confirm and screen the valuable data, which will be difficult to meet people's decision-making needs at work. With the advantage of artificial intelligence technology, it can judge and process massive data efficiently, so as to simplify the process of data analysis and integration, so as to help people screen out a large number of useless or ambiguous data, and improve the analysis and processing efficiency of data information.

3.4 Thinking and judging ability

The emergence of artificial intelligence technology has also had a certain impact on the way humans think. As a way to replace human thinking, artificial intelligence technology can simulate human thinking processes by collecting data, calculating and other operations, and then execute relevant commands. Therefore, some equipment equipped with artificial intelligence technology can also complete the specified production operations, and at the same time liberate the labor force, it can also be invested in some special industrial activities to reduce the probability of safety accidents ^[2].

4. Application of artificial intelligence technology in electronic engineering automation control

4.1 Automatic intelligent control system

Intelligent control is a major application field in the development of electronic engineering

automation control using artificial intelligence technology. At present, in intelligent control, the main control methods are expert system control, fuzzy control and neural network control. By using different control methods, automatic control work is carried out, the goal of intelligent control is realized, and the control function level of electronic engineering automation is improved. As the main type of technology in electronic engineering, automation control technology directly determines the level of production efficiency of electronic engineering. With the blessing of artificial intelligence technology, the intelligent level of the automatic control system of electronic engineering has been improved, which has effectively solved the problem of poor adaptability of the previous automatic control system, and can meet the life needs of people under the current social and economic development. The automatic intelligent control system based on artificial intelligence technology has significantly improved the adaptability level, and can also achieve smooth execution of some more complex operation instructions, thus greatly improving the efficiency of production tasks. Moreover, through the use of artificial intelligence technology to transform the automatic control system of electronic engineering, it can also realize the optimization of its operating process, and comprehensively improve the operator's control over the system. This effectively reduces the probability of various accidents caused by human error, and provides a good guarantee for the improvement of system stability. In this way, the quality of electronic equipment produced by electronic engineering has been greatly improved, and the diversified needs of people have been effectively met.

4.2 Computer aided design technology

As the key content in the production of electronic engineering, electrical mechanical design contains a relatively complex design process and involves a wide range of knowledge, so it puts forward relatively strict requirements on the theoretical knowledge reserve ability of relevant designers, and also requires them to have strong professional operation ability. For the previous electronic equipment design work, most of the cases rely on the designer's own experience, this method of work has a large randomness and uncertainty, so the production of equipment can meet the requirements of the standard has been unknown, not conducive to the improvement of electronic engineering production efficiency and production quality level. With the blessing of artificial intelligence technology, computer-related technologies have achieved innovative development, and auxiliary technology with computer technology as the main body has become an important technical means in the design of electronic equipment at present, which has realized the improvement and optimization of traditional electronic equipment design methods and significantly reduced the possibility of accidents. On this basis, through the use of computer functions and intelligent algorithms to the electronic engineering production equipment quality inspection work, can effectively ensure its quality to meet the production requirements. In addition, the quality inspection and other related work activities carried out in this way also significantly improve the efficiency compared with the previous working methods, save a lot of labor costs and time costs for the enterprise, and help improve the economic efficiency of the enterprise^[3].

4.3 Electronic CAD technology

In the continuous development of artificial intelligence technology, electronic CAD technology has also achieved good development, and to a large extent achieved technical optimization, and can play an important application effect of genetic algorithm and expert system. Genetic algorithm, as an advanced electronic system calculation method, has been widely used in recent years. When it is used in the processing of some information data, it can deal with the huge amount of information computation efficiently and ensure the accuracy of data calculation results. At the same time, the genetic algorithm is applied based on the information transmission system, which can also realize the control instructions to the equipment at a distance, and can calculate, analyze and compare the data of the equipment through the intelligent algorithm, so as to timely diagnose and deal with whether the equipment has faults and hidden problems. Compared with the previous method of one-by-one elimination by manual detection, the work efficiency of fault handling is greatly improved. In addition, relying on the advantages of electronic CAD technology, it can also carry out the automatic execution of relevant operations by setting logic language and control program, and realize the real-time fault monitoring of the whole process of electronic engineering production process, without relying on on-duty supervision. This not only ensures the production and operation efficiency of electronic equipment, but also guarantees its quality, improves the automatic control effect of electronic engineering, and promotes the technological innovation and development in the field of electronic engineering^[4].

4.4 Fault location technique

Based on the current modern equipment, although it has achieved a high level of automation effect, it is difficult to ensure the occurrence of zero fault problems. In the actual operation process, or the operation of the equipment itself has problems, or the operator has human error problems, these reasons will lead to fault problems, and then have an adverse impact on the production efficiency of electronic engineering. Therefore, in the case of troubleshooting, how to accurately locate the fault problem is a problem that relevant personnel should focus on, which can effectively improve the efficiency of troubleshooting, so that electronic engineering can be restored to production and operation as soon as possible, and reduce the economic loss of enterprises as much as possible. In the previous working mode, once the automatic control system of electronic engineering has a fault problem, the relevant personnel need to carry out manual analysis and elimination under the condition of limited technology, and the fault location and processing efficiency is relatively slow. Under the effective integration and development of artificial intelligence technology and electronic engineering automation control, a new electronic engineering automation control system fault detection and positioning system can be built by combining various methods with the advantages of intelligent technology. Such as expert system, neural network and fuzzy logic, etc., are important components of the system. Relying on the composition of these key systems, when the fault occurs, it can be quickly and accurately judged, so as to determine the cause of the fault in the first time, so as to locate the fault location, so as to quickly solve the fault and provide guarantee for efficient production.

4.5 Fuzzy engineering application

Mechanical processing in traditional mechanical and electronic engineering needs to go through complex processes, and the actual production efficiency is difficult to be improved. A new control model should be built on the basis of traditional control methods to optimize and improve the automatic control system of electronic engineering. With the popularization of artificial intelligence technology, fuzzy control engineering has gradually been applied to the automatic control of electronic engineering. The application of fuzzy control theory requires that the possible error range should be determined in the process of fuzzy control, and the control work should be carried out within the specified range. This can not only reduce the difficulty of automatic control, but also ensure absolute accuracy. Relevant personnel need to analyze and study the reasonable error range of electronic engineering production, based on which to improve the application effect of fuzzy control technology, and then provide guarantee for the accuracy of electronic engineering automation control.

In the process of development and practical application, fuzzy reasoning theory has a high realistic processing ability, which can not only analyze the analog and physical quantities, but also automatically fit the data through the driving mechanism in the automatic control system. In this process, the fuzzy reasoning model built based on artificial intelligence technology provides a technical system with logical control function for mechanical and electronic engineering technology and related products. Through control theory, the data model is reformed and analyzed, so that the network data and electronic data in mechanical and electronic engineering can realize the self-matching processing of correspondence line relations. In addition, with the help of fuzzy reasoning theory, we can conduct independent retrieval processing according to different data, such as analyzing computational and physical quantities; Automatic retrieval of data in single machine and online state; Analyze the difference between the input and output of mechanical and electronic engineering technology in the application process. If the difference between the two is large, the fuzzy reasoning theory can be used to analyze and deal with different application links, verify where the fault occurs, and then feed back to the terminal system for independent identification and control.

4.6 Fault diagnosis technique

For all kinds of faults occurring in the operation of electrical systems and related equipment, the staff must first investigate the nature of the fault and its specific causes in detail, and form an accurate fault diagnosis through scientific analysis on this basis. The artificial neural network covered by artificial intelligence technology has strong ability in acquiring knowledge, can simulate the organization structure of human brain, and learn the specific process of human cognition, so as to process information in an intelligent way. By constructing and learning standard samples, the system can automatically identify information faults and deal with them effectively. Artificial neural network contains many "neurons", and each "neuron" can scientifically diagnose and correctly deal with its corresponding faults. Artificial

neural network can quickly realize the scientific classification and effective treatment of faults, ensure the scientific diagnosis and evaluation of faults, and realize the real-time control of the system.

To diagnose the fault of electronic engineering automation control system, expert system should not only rely on the practical experience of relevant experts in the field, but also use the computer program correctly and flexibly. The expert system carries out systematic screening, scientific diagnosis, effective detection and timely reply to the faults existing in the electrical system, and summarizes the occurrence of each fault accident, summarizes its diagnosis experience, carries out scientific classification, builds work logs, and stores them in the expert knowledge base, so as to reserve relevant experience for the rapid treatment of similar faults.

5. Application path of artificial intelligence technology in electronic engineering automation control

5.1 Comprehensive analysis of product production path

In electronic engineering, artificial intelligence technology should be used reasonably, according to the needs of automatic control, automated production and design. In automated production, we must strictly follow the requirements of automatic control, scientific design of automation systems, meet the production requirements of products, do a scientific inspection, and scientifically carry out the production and processing of various products. Standardize the use of artificial intelligence technology in electronic engineering, meet the requirements of product model inspection standards, and set perfect control inspection procedures. Based on the existing inspection procedures, it is necessary to pay attention to the comprehensive analysis of the production model and adapt to the requirements of the inspection standards of various procedures to the greatest extent. In the production of various products, we should pay attention to the scientific development of various production requirements and launch mass production. Based on the production results, the existing automatic production application structure is continuously optimized to achieve efficient product processing. Select artificial intelligence technology to design electronic engineering reasonably, and fully optimize the development path of electronic engineering automation^[5].

5.2 Improve command adjustment path work

At present, it is necessary to standardize the use of artificial intelligence technology and centralize the optimization of the development path of electronic engineering automation. The application of intelligent technology in electronic engineering automation control can effectively check the problems existing in the production stage. The automatic control structure is optimized by integrating systematic errors to avoid system paralysis. In general, in the use of automated operation equipment, it is necessary to carry out various command execution operations, such as work and production work, by exerting the application value of automated control systems. For the external solid mechanical equipment system, in the long-term use, the external structure will appear different degrees of wear. When the command transmission is carried out under such conditions, the actual transmission quality will be affected, resulting in the difference between internal and external work. The occurrence of such problems in operation, when there is an irreconcilable status quo, will lead to the gradual collapse of the overall structure of automation. Therefore, in the application of electronic engineering intelligent technology, it is necessary to do a scientific and intelligent regulation and inspection, analyze the differences in operation, and effectively prevent the paralysis of the program^[6].

5.3 Optimize control and inspection procedures

In the regulation and inspection procedures, it is an important part of the independent design of products. We should pay attention to the standardized use of electronic engineering automation control system to ensure that the control of various program commands can be effectively realized. Rational use of programmable logic control equipment and human-computer interaction window to optimize the overall structure of the product. In the electronic engineering automation control, artificial intelligence technology should be standardized, and the design automation area, command sensing area and command execution area should be divided. Program inspection and control work should be designed in the automation area, do a good job of command exploration, and reasonable regulation of electronic engineering automation procedures, so as to provide various guarantee conditions for the launch of independent inspection activities. In the development of electronic engineering automation, artificial

intelligence technology should be standardized in electronic engineering automation control, which can provide effective technical support for operation and maintenance program control. Through the rational use of artificial intelligence technology, do a good job of standardized program design, and execute effective self-check program commands, the application value of the intelligent detection system can be played, the problems existing in the execution of commands can be investigated in time, and the standardization adjustment can be made. Technical personnel should also adjust external operation commands, practice judgment on the asymmetric status quo of database information, rationally optimize the overall structure in the operation process, and realize timely adjustment of operation and maintenance commands.

5.4 Fully integrated material selection and transportation

Since the automatic production system in the control process is an indispensable part of the production of products, it can be summarized as application operation procedures, product processing and implementation. In the work related to material selection and processing operations, artificial intelligence technology should be used in electronic engineering to reasonably integrate the manufacturing process elements of the product, so as to achieve the reasonable application effect of the product, which requires project managers to realize the importance of artificial intelligence technology and use it as the main tool for project operation. In the process of implementation, employees should strictly comply with the product quality requirements of the enterprise, conduct scientific processing of raw materials, effectively optimize the overall structure of the electronic engineering automation control system, and improve the level of electronic engineering automation [7].

6. Conclusion

In summary, the application of artificial intelligence technology has brought good opportunities for the development of the field of electronic engineering, which can not only effectively meet the current economic and social development needs, but also play an important role in promoting the development of electronic mechanical engineering and improve the level of automatic control of electronic engineering. Therefore, based on the important role played by the application of artificial intelligence technology in electronic engineering automation control to improve production efficiency and ensure data accuracy, in order to promote the continuous improvement of social and economic level, in-depth research should be carried out in this aspect, so as to realize the further integration of electronic engineering and artificial intelligence technology. In order to comprehensively promote the good development of electronic engineering automation control and promote the technical reform of the industry.

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