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Discussion on the Application of Artificial Intelligence Technology in the Development of Electronic Engineering

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Abstract: *As an advanced technology in China, artificial intelligence technology has a very high application value. Its application in the field of electronic engineering has improved the level of production technology, increased productivity, and promoted the development of the field of electronic engineering in the direction of intelligence and automation. This paper briefly outlines the artificial intelligence technology and its connection with electronic engineering, and discusses the application of artificial intelligence technology in the development of electronic engineering field, hoping to provide reference for the use of artificial intelligence and the development of electronic engineering field.*

Keywords: *Artificial intelligence technology; Development in the field of electrical engineering; Application discussion*

1. Introduction

The rapid development of society has led to the rapid development of productivity. Electronic engineering is gradually evolved from the traditional industrial mechanical work, and with the continuous promotion and application of computer technology and Internet technology, it is constantly developing towards intelligence and automation. In addition, the introduction and use of artificial intelligence technology in the past few years has also improved the production level in the field of electronic engineering. The development of the field of electronic engineering is inseparable from the use and research of artificial intelligence technology, and relevant personnel should actively study the value of the use of artificial intelligence in the field of electronic engineering and how to effectively use it, so as to continuously promote the development of electronic engineering.

2. Overview of Artificial Intelligence Technology

With the development of the information age, electronic information technology and computer technology have been popularized, providing convenience for people's life and work. At the same time, with the rapid development of the times, the electronic information technology and computers have given rise to artificial intelligence technology, the use of this technology to further promote the automation and intelligent development of the production field, significantly improving production efficiency and production speed. At the same time, in the process of the development of artificial intelligence technology, its own automation requirements continue to become higher, and the use of a comprehensive variety of related software, such as digital multimeters, standard sources, etc., so that the intelligence and automation of artificial intelligence technology to effectively improve the level of further promote the development of artificial intelligence technology and its application value. The development of artificial intelligence technology is from the development of computer and electronic information technology, the initial artificial intelligence technology because people do not have a systematic understanding of computer technology, which led to the slow development of artificial intelligence, many people are not familiar with. In the middle, computer technology is more and more people recognized, and widely used, at the same time, a variety of interconnection technology is gradually increased, artificial intelligence technology is gradually accepted by people. With the development of artificial intelligence technology in the field of electronics, various high-tech electronic products are widely used by people, and people's living standards are constantly improving, which further promotes the use of artificial intelligence technology in life and the rapid development of artificial intelligence technology [1].

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3. The Relevance of Artificial Intelligence to the Field of Electronic Engineering

Electronic engineering and artificial intelligence are achievements of each other and win-win cooperation. For the field of electronic engineering, through the use of artificial intelligence technology, production efficiency can be improved, while it can also improve the quality of production and accelerate the progress and development of the field of electronic engineering. The whole production process of electronic engineering industry is tedious and fine, which requires a large amount of labor and heavy work content, while artificial intelligence can replace a large amount of labor and effectively solve the problems in fine management to scientifically allocate production materials and staff, making the work efficiency greatly improved and saving labor costs. It can also be based on the system of reasonable deployment of post personnel, timely replenishment of personnel, in the production of electronic engineering, operation control more accurate, z which greatly improves the timeliness and accuracy of the production and processing process. Not only that, the use of artificial intelligence technology can ensure accurate data storage, which greatly improves the stability and safety of equipment operation, and can promptly detect errors in the operation process, stop losses in time and reduce economic losses. It can be said that artificial intelligence technology not only optimizes the production method in the field of electronic engineering, but also promotes the diversified development of the field. Then, for artificial intelligence, the development of the field of electronic engineering has likewise laid the foundation for the rapid development of engineering intelligence industry [2].

4. Artificial Intelligence Core Technology

The core of artificial intelligence technology lies in "machine learning", while the technology beyond the core lies in "human-machine interaction", which is like the difference between the soul and the body, the former allows the machine to have the ability of intelligent research and judgment, while the latter allows the carrier carrying the intelligent brain to deal with matters in anthropomorphic areas or problem solving.

In terms of "machine learning", it is the intersection of computer science, cybernetics, information theory, psychology, linguistics and other multidisciplinary technologies, and is divided according to algorithms, computing power and data. The algorithm level includes supervised learning, unsupervised learning, reinforcement learning, migration learning, deep learning, etc.; the arithmetic level includes AI chip and AI computing architecture; the data level includes data processing, data storage, data mining, etc. The application in the field of electronic engineering is based on "feature extraction", which analyzes the information obtained after pre-processing the dynamic signals of electronic systems, extracts the data related to the state of electronic systems, and then analyzes these data to extract the sensitive features that are more relevant to the state of the system. The techniques of extracting and analyzing sensitive features include signal amplitude analysis, correlation analysis, frequency domain analysis, time series analysis and feature analysis, etc. Based on the massive sensitive feature data, the machine is prompted to perform adaptive learning to simulate the human intelligence in different scenarios for the judgment and processing of these sensitive features, and then to achieve automatic control, intelligent decision-making, online monitoring, fault diagnosis and many other functions in electronic engineering.

In terms of "human-robot interaction", it includes "natural speech understanding", "machine vision recognition", "natural odor recognition ", "natural language generation", "positioning and module recognition" and other core technologies, so that artificial intelligence robots with anthropomorphic listening, seeing, smelling, speaking, feeling and other functions. For example, positioning and module recognition: under the premise of the basic positioning function, with the visual module recognition function, infrared scanning, microwave, optical recognition and other technologies can build a three-dimensional three-dimensional characteristics of things in the field of view, so that the type and characteristics of objects in the field of view can be clearly recognized, so that artificial intelligence has the ability to "perceive"; while the positioning function allows artificial intelligence to have the ability to "perceive"; The positioning function allows AI robots to move freely in complex environments.

5. The Application of Artificial Intelligence Technology in the Development of Electronics

5.1. Application in Electronic Engineering Data Storage

In the field of electronic engineering, it is necessary to store a large amount of data and ensure the

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accuracy of the data. Distributed information storage is an important feature in neural network systems through the stimulation of neurons to distribute and transmit information in the network for dynamic interaction purposes. Although the neural network system itself has a simple structure and limited functions, its functions are enriched by the support of neurons, and it can well meet many needs in electronic engineering.

In the field of electronic engineering, through the use of neural network systems, some important information in production is effectively collected and stored, and then the data is analyzed and processed, which greatly improves the accuracy of the data, ensures the safety of data storage, and facilitates the use of subsequent functions. In addition, the point-to-point mapping technique in artificial intelligence technology can be used to make the relationship between neurons and stored data more stable, which can effectively improve the accuracy of data operations [3].

5.2. Application in Automated Production

In the actual production in the field of electronic engineering, because the industry involves a large variety of equipment, complex technology, there is a close connection between the equipment, but also in the production process there are often a variety of unexpected conditions, which will cause a certain obstacle to the operation and maintenance. The use of artificial intelligence technology accelerates the development of automation in the field of electronic engineering production. The relevant technical personnel can realize the establishment of control models on the traditional control methods, through which the automatic control of mechanical and electronic engineering can be carried out, and the application and study of fuzzy control systems can be added. It Is different from the traditional control theory In that the control process must be absolutely precise and its error range must be determined so that the control work can be within the specified range, which can reduce the difficulty of automatic control. In actual production, it is most important that technical personnel should conduct in-depth research on the effective use, so that fuzzy control technology can really play its application value and reflect the value of artificial intelligence technology [4].

5.3. Application in Intelligent Production

Intelligent control system is the product of the combination of artificial intelligence technology and computer technology, it is a progressive system of traditional automatic control system, with super simulation ability, which can simulate human brain thinking and physical movements, and collect production data, process information and transmit information through human brain structure to provide accurate information for production. It has been widely used in the field of electronic engineering in China, and the production management and control are more efficient and humanized. In the actual production of electronic engineering, through the use of intelligent control systems, any part of the production can be simulated, and managers can manage and understand each production process in real time through the simulation system and pay attention to the actual situation in production in real time. For the problems in the production, we can also find the problem in time, timely get with effective treatment, this production management work prompted the efficiency, managers do not need to carry out the production site can always understand the entire production process. At the same time, the intelligent control system can also monitor the operation of dangerous positions in real time, and monitor the operators of dangerous positions in real time to ensure that their operations meet the relevant safety requirements. The system can collect relevant generated data, for the existence of abnormal problems can be timely warning, timely investigation of hidden problems, so as to reduce the production risk factor, so that the electronic engineering production environment in a safe state, to ensure staff safety, and then improve the overall production efficiency[5].

5.4. The Application of Electronic System Fault Diagnosis

In electronic engineering, large electronic equipment structure is complex, improper operation will affect the normal operation of the equipment, especially the internal failure of the electrical components will directly affect the normal operation of the equipment, the daily maintenance is very difficult, which has caused obstacles to the daily maintenance personnel. And the use of artificial intelligence technology can achieve automatic maintenance, data collection and analysis of high efficiency, work accuracy g high. When problems occur in electronic engineering equipment, artificial intelligence can quickly remind and prompt the overhaul, so as to do the maintenance and management of the equipment and promote the normal operation of the equipment, which helps to improve the efficiency

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of the overhaul staff and alleviate this dilemma. It can manage the real-time data tracking of the operation status of different electronic components and alert the abnormal data. However, under actual working conditions, artificial intelligence technology can summarize the operating data of different electronic components on a regular basis, analyze their operating change trends, analyze the analysis of electronic components in advance, and replace them in time to ensure that the failure rate of electronic components is reduced. Secondly, the expert system can also scientifically summarize different types of electronic yuanqi faults and continuously accumulate fault information in the system, and the professional can facilitate the system to judge the type of fault for different types of fault problems and provide timely feedback on the problem. In this way even a worker with little experience or even no maintenance experience can effectively determine the equipment failure. In addition, the expert system can also be used to handle different fault problems, combined with the actual equipment fault problems for scientific optimization, so that the fault handling methods are more and more in line with the actual equipment fault problems, to further enhance the efficiency of electronic system fault problem solving. At the same time, the relevant personnel can also draw up relevant maintenance plans for common equipment failure problems and improve the efficiency of equipment use. Through the use of artificial intelligence technology not only makes maintenance work more intelligent, can effectively rank the cause of equipment failure, accurately identify the failure problem,. And when equipment failure occurs, people can also use artificial intelligence instead of traditional manual maintenance, compared with the traditional maintenance methods, IIccuracy Is higher.

5.5. Application in Electronic Engineering Product Design

In the product design of traditional electronic engineering, the model making process is very complicated, and there are many technical requirements. Moreover, the automatic design system has always had some shortcomings, and there are often unreasonable designs or design errors, which affect the design quality of electronic products as a whole, and even lead to the use failure of electronic engineering and affect the production progress, which is very unfavorable to the long-term development of electronic engineering. However, through the application of artificial intelligence technology, the shortcomings in the automatic design system are largely made up. By combining genetic algorithm with CAD drawing technology, it can effectively solve the problems of traditional electronic engineering design. This is mainly because when artificial intelligence technology is used in electronic engineering, the product design can be completed without making models, and there will be no problems such as design deviation and unreasonable system design, which can avoid the problems in product design and improve the practical application level of electronic engineering. Moreover, by using artificial intelligence technology, the design and research time of electronic engineering products can be shortened, and the quality of research and development can be ensured and the product design level of enterprises can be improved[6].

5.6. Application in electronic engineering security

Electronic engineering relies on computer networks as a carrier, and network security has become a hot topic of discussion in the new era, electronic engineering basic network security will directly affect the effectiveness and security of electronic engineering systems, especially large, sophisticated electronic engineering systems. The electronic engineering security said in the new era lies more in network attacks, data viruses, disaster recovery, information data encryption and other contents. Some firewalls can only be managed through set network security management means, and loopholes also exist at any time, new types of network viruses are emerging, the status of electronic engineering system security is not optimistic. The development of artificial intelligence technology is a new solution for the construction of electronic engineering security. Based on artificial intelligence for deep learning, the electronic engineering network firewall has intelligent properties and can independently derive network security technology, with a higher level of data analysis capability. On top of this, the firewall can identify network viruses well, especially some disguised viruses. At the same time, it can also simulate possible network hazards and arrange corresponding strategies, with stronger countermeasures for unexpected situations.

5.7. Applications in electronic robotics

The application of artificial intelligence technology in the field of electronic engineering also lies in electronic robots, based on human-robot interaction of "natural speech understanding", "machine vision recognition", "natural odor recognition Based on core technologies such as "natural speech

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understanding", "machine vision recognition", "natural odor recognition", "natural language generation" and "positioning and module recognition", we have developed various types of robots that can normally handle electronic engineering operations, such as handling robots and inspection robots. Electronic robots are able to work in complex and dangerous places, and can effectively reduce the human cost that needs to be borne in the field of electronic engineering.

6. Application Value of Artificial Intelligence Technology in the Field of Electronic Engineering Development

In the development of electronic engineering, the application of artificial intelligence technology has played an important role. First, the application of artificial intelligence technology has promoted the development of electronic engineering towards automation and intelligence. In terms of production and management, it can be automated, intelligently managed and operated, which greatly improves the efficiency of production and management. Managers can supervise and manage in real time. By collecting and analyzing relevant data, the time of managers is greatly saved, which has a significant effect on improving work efficiency.

Second, the fault diagnosis process is optimized. In the process of human production and development, it is usually applied to all kinds of electronic equipment. The use of electronic equipment has a certain service life. If the equipment parts are not replaced in time, a series of faults will occur. Through the application of artificial intelligence technology, automatic maintenance and diagnosis can be realized, and the original fault diagnosis process can be optimized, which greatly improves the diagnosis efficiency.

Third, improve the accuracy of electronic engineering equipment. Artificial intelligence technology can not only improve the productivity of mechanical and electronic engineering, but also reduce the rejection rate, which plays a certain role in improving the accuracy of electronic engineering equipment. During the operation of electronic engineering equipment, the parameters of electronic equipment should be set within the specified range, and the error should be controlled within the controllable range, thus improving the product accuracy. The application of artificial intelligence technology in electronic engineering equipment can effectively solve this problem. The accuracy of the equipment can be adjusted through the collected data, and finally it will be stabilized in the qualified range, which has certain effects on improving production quality and efficiency[7].

Fourth, save human and material resources. Through the application of intelligent technology, the field of electronic engineering has been further developed, the effective combination of electronic technology and mechanical production can be realized, each program can be effectively monitored by simulation, the error rate in the production process can be reduced, the production efficiency and product quality can be improved, the manpower and material resources can be greatly saved, and the rapid development of electronic engineering in China can be promoted.

7. Conclusion

To sum up, in the information age, artificial intelligence technology has been widely used in various industries, which greatly improves the operation stability and production efficiency of electronic engineering equipment, at the same time, it also reduces the maintenance difficulty of equipment systems, reduces labor costs, improves production, and creates greater profit value for enterprises. In the development of electronic engineering, relevant personnel should deeply study the effective application of artificial intelligence technology in various fields of electronic engineering and actively establish the connection between production and science and technology, so as to continuously improve the production level of electronic engineering, develop in the direction of automation and intelligence, promote the economic development of electronic engineering and promote the rapid economic development of China.

References

[1] Wu Shen. Discussion on the application of artificial intelligence technology in the development of electronic engineering [J]. Engineering Construction and Design, 2020,000(18):2.
[2] Lu Mingwei. Discussion on the application of artificial intelligence technology in the development of electronic engineering [J].IT Manager World, 2020,145(3):12-13.

ISSN 2616-5775 Vol. 6, Issue 6: 67-72, DOI: 10.25236/AJCIS.2023.060610

[3] Hao Haiyan. Discussion on the application of artificial intelligence technology in the development of electronic engineering [J]. Good days, 2019,020(28):1.
[4] Huang W,Yang P. Application Analysis and Research of Artificial Intelligence Technology in the Creative Stage of Web Design[C]//Wuhan Zhicheng Times Cultural Development Co., Ltd.. Proceedings of 5th International Workshop on Education Reform and Social Sciences (ERSS 2022).BCP Social Sciences & Humanities,2022:536-544.
[5] Shibata Mayuri,Okada Wataru,Sano Keisuke,et al. [Usefulness of an Ultrasound System with Automatic Bladder Urine Volume Measurement Using Artificial Intelligence Technology in Radiotherapy].[J]. Nihon Hoshasen Gijutsu Gakkai zasshi,2022(12):78.
[6] Fei H, Hu Z. Corrosion Detection of Structural Reinforcement Based on Artificial Intelligence Technology[C]//Eliwise Academy.Proceedings of the 2021 International Conference on Materials Chemistry and Environmental Engineering (CONF-MCEE 2021).IOP Publishing,2021:321-327.
[7] Qingquan J,Honggang H,Rui Z. Research on the Application and the Ethic Problems of Artificial Intelligence Technology in Eldercare[C]//Construction Industry Committee, China-Asia Economic Development Association, Institute of Engineering Management, Beijing University of Civil Engineering and Architecture,Intelligent Construction and Automation of Construction Engineering.Conference Proceedings of the 8th International Symposium on Project Management, China (ISPM2020).Aussino Academic Publishing House,2020:969-976.