

Application of Artificial Intelligence in the Field of pattern recognition

Wei Cui

Department of electronic engineering, Chongqing Aerospace Polytechnic, Chongqing 4000021, China

atracy_cw@163.com

Keywords: Artificial intelligence, Pattern recognition, Application.

Abstract: with the continuous development of information technology and artificial intelligence, pattern recognition, as an aspect of artificial intelligence, has been deeply studied in this field, especially the theoretical basis and research scope of this model are also expanding. This paper first introduces the meaning of artificial intelligence and pattern recognition and focuses on the application of artificial intelligence in pattern recognition.

1. Introduction

With the rapid development of computer technology, especially the continuous expansion of the field of computer hardware, the computer has made further development in perceiving external sound, text, images and other information. When we go shopping in the supermarket, the cashier at the checkout can gently scan the parameters of the goods we buy, thus quickly calculate the amount payable; in the hospital, we can sense our viscera by doing B-ultrasound; TV stations accurately forecast the weather every day. Items such as scanners are the product of computer perception of the outside world and the product of artificial intelligence. The corresponding pattern recognition technology has also become the current research focus of researchers. [1]

As an aspect of artificial intelligence research, pattern recognition mainly simulates human beings through computers and uses human perception to complete the perception of the external environment and make correct judgments.

2. Artificial Intelligence

Corresponding to natural intelligence, artificial intelligence is a method and technology of computer simulation to extend and expand human intelligence, and the result is "machine thinking".

As a discipline, the main research direction of artificial intelligence is to study the intelligent behavior of computers and to develop computing systems with similar human thinking activities, such as perception, reasoning, learning, association and so on. Especially in decision-making and other aspects that can solve complex problems that human experts can deal with, and finally achieve a high degree of unity between computers and human beings. The essence of artificial intelligence is to realize the imitation of human thinking by computer. [2]

3. Pattern recognition

In a broad sense, pattern recognition mainly involves two aspects: one is to take the organism as the research object, which belongs to cognitive science; the other is to take the computer as the research direction to study how to realize the personification of the computer. This paper mainly discusses the theory and method of computer simulation recognition.

Pattern recognition is a research direction of artificial intelligence, which mainly uses the computer as the medium and adopts the method of mathematical techniques to realize the automatic processing and interpretation of patterns. The "mode" mentioned here refers to the objective objects in the external environment and environment. With the deepening of information technology and artificial intelligence research, human processing of complex information has developed to a certain

extent. However, these studies are still in the initial stage, and we need to continue in-depth research. At present, the recognition of the external environment (text, voice, characters, etc.) by computer is the main research point of computer pattern recognition. Information processing is that human beings identify and judge the information according to the different environments and conditions. For human beings, the main sources of information are optical information and acoustic information, and the collection of optical information is mainly obtained by visual devices. The acoustic information is mainly obtained through auditory devices, and pattern recognition is mainly to enable computers to complete information collection similar to human beings. At present, the more mature information acquisition systems in the market are optical character recognition systems, speech recognition system and so on. [3]

The study of pattern recognition originated in the 1950s by F. Rosenblatt first proposed and preliminarily realized the recognition of a given sample. With the continuous study of pattern recognition, in the 1980s, J. Hopfield put forward the artificial neuron, which makes the computer have a broader space in pattern research, and has made remarkable achievements in a short period.

4. Application of artificial intelligence in pattern recognition

4.1 Digital recognition, Chinese character recognition, speech recognition

Handwritten digits have played a very important role in the banking business and postal code recognition in the past, but because of individual differences and different people's writing habits, it is very difficult for staff to identify and increase the difficulty of the work. It is also easy to cause mistakes, so the intelligent recognition of handwritten numbers is a part of artificial intelligence recognition, and with the development of artificial intelligence, this problem can be solved completely.

Compared with digital recognition, the recognition of Chinese characters is more difficult. At present, there are 6763 commonly used Chinese characters. In the process of using them, they are not only affected by artificial writing habits but also disturbed by many factors, such as special symbols, foreign characters and so on. This increases the difficulty of intelligent recognition. Each character will have a corresponding symbol, if the beginning changes in the recognition process, that is, the corresponding subsequent recognition will be distorted. And because of the huge Chinese character system and the different patterns presented, the difficulty of computer recognition is greatly improved. Therefore, it is difficult to realize the recognition of handwritten Chinese characters. The basis of solving this problem is that we need the support of neural network technology, and at the same time, we also need to enrich the patterns of different types of handwritten fonts as samples to input into the computer the neural network that is constantly training computers, to make them familiar with different types of fonts. At present, more mature Chinese character recognition software has realized the recognition of characters in scanned pictures with high accuracies, such as Tsinghua Ziguang OCR software.

In short, speech recognition enables computers to understand human language. The current commonly used automatic oral translation system can translate seven languages, namely, English, Japanese, Italian, French, German, Chinese and Korean. The Chinese experimental platform is undertaken and constructed by the Institute of Automation of the Chinese Academy of Sciences. It belongs to the national key laboratory, which also makes China's oral translation at the leading level in the world. The construction of this system makes it more convenient for our people to live and travel abroad.

4.2 Network examination system based on pattern recognition

The network examination system based on pattern recognition mainly adopts SQLServe database and fingerprint mode and successfully realizes online examination, training, and learning

With the rapid development of information technology, personnel of various companies and units need continuous learning and training to meet the needs of work development. Because of the large number and mobility of personnel, this adds a great burden to the arranged staff, while the network

examination system based on pattern recognition simplifies the workflow and reduces the burden of the staff.

In enterprises, the examination system based on pattern recognition is mainly used in multimedia classrooms, which is mainly composed of one server and two fingerprint recognition instruments. The development tool is caterpillar Builder 5.0. Windows is the operating system. There are four main aspects of the software composition of the examination system: fingerprint verification, test paper management, examination management, examination records

Fingerprint verification is the shutdown technology of the system, which uses pattern recognition. Fingerprint verification is divided into verification and identification. Verification is a process of matching the collected fingerprints with the examiners' fingerprints to confirm their identities. Identification is to match the fingerprints collected on the spot with the fingerprints that have been collected, to prove its legitimacy. The fingerprint acquisition of the computer can only get limited information, and can not achieve 100% accuracy, so the result can not be completely guaranteed that there is no error. Although there are security risks in fingerprint identification, it has a higher security level than the traditional user ID+ password.

4.3 Face stereoscopic pattern recognition

The process of face recognition is more complex, which is mainly divided into three parts: face pattern database, facial feature location, and comparison. The first is to collect the human face and construct the database, the second is to normalize the main organs and shape information of the human face collected on the spot, and finally to compare it with the future database to maintain or replace the hidden parts. The electric fire detector in the intelligent monitoring system realizes the collection of terminal data, discovers the alarm information in time, and uploads the residual current, temperature and other information to the electric fire monitor; the monitor realizes the storage, analysis and preprocessing functions of real-time and historical data. [4].

4.4 Other Feature

Realize distributed and linear detection of cable temperature, leakage, and residual current, realize electrical fire prevention in civil, industrial and agricultural fields, and realize condition monitoring of different high and low voltage electrical equipment such as high and low voltage branch boxes, distribution rooms, high and low voltage distribution cabinets, power supply terminals and transformers. Compared with big data, ARM embedded processing memory can enhance the data operation ability, speed up the communication rate, improve the performance of real-time monitoring of the system, and realize a humanized and personalized chart data monitoring interface, which is presented to the customer terminal in a more intuitive, convenient and easy-to-operate form. [5]

The system is based on prevention and the combination of prevention and control, realizes the centralized data management and real-time push of the cloud platform, and effectively applies the distributed architecture and multi-tier management mode to practice, which can not only achieve fault alarm and automatic power outage of electrical equipment but also make effective use of wireless interconnection technology to enable the leaders of relevant departments and the terminals of management users to grasp the main functions of the field in a timely and accurate manner.

5. Conclusion

In a word, the combined application of the Internet of things technology and monitoring system not only realizes the remote intelligent monitoring of electrical fire but also pushes the scientific and modern electrical fire monitoring system to the fast lane of high-speed development. Although the intelligent monitoring system has made great progress at this stage, it still needs to be improved in some technical fields with a high level of science and technology and strong innovation ability. Therefore, make rational use of the Internet of things, big data, cloud management platform and other advanced technology applied in the field of disaster emergency response, to achieve the fine

management of remote data intelligent monitoring, and improve the ability of prevention and supervision of electrical fire hazard detection.

References

- [1] Wang Jiangang, du Yulong, et al. Functional reliability analysis of electric fire monitoring system [J]. Fire Science and Technology, 2009 (4): 40 Me1 43.
- [2] Zhang Hui, Chen Classical. Urban fire remote monitoring system based on the Internet of things [J]. Information Research, 2010 (10).
- [3] Wu Xiaohu. Design and Application of Electric Fire Monitoring and alarm system [J]. Building Materials Technology and Application, 2012 (4).
- [4] Park S H, Lee S P. EMG pattern recognition based on artificial intelligence techniques[J]. IEEE Transactions on Rehabilitation Engineering, 1999, 6(4):400-405.
- [5] Khezri M, Jahed M. Real-time intelligent pattern recognition algorithm for surface EMG signals[J]. Biomedical Engineering Online, 2007, 6(1):45.