



Research on Classification of Articles of Artificial Intelligence

Yi-Jen Mon, Shi-Ue Chiu, Jern-Yu Pu, Jung-Yi Zuan, Ping-Yen Chen, Chi-Yuan Huang

Department of Computer Science and Information Engineering, Nanya Institute of Technology, Chung-Li, Taoyuan, 320, Taiwan, R. O. C.
monbuy@nanya.edu.tw

Abstract The research on the classification of items of artificial intelligence in this research has attracted everyone's attention. Artificial Intelligence (AI) is a term that attracts people but teaches everyone to be afraid. What attracts us is an intelligent robot that can think, can assist people with work, and can wash and cook for us with children; make us afraid The thing is that this robot can think on its own, what if he becomes disobedient one day? Worse still, one day the boss finds that he is better than me. Then I will lose my job? Many people think that artificial intelligence is the thinking robot in science fiction movies. Is artificial intelligence really so magical? To what extent has the current artificial intelligence developed? What are its limitations? This paper is focus in this point to propose a method based on Neural network to solve this problem. The simulation result reveals the performance and reliability.

Keywords Artificial intelligence (AI), Neural network, Classification

1. Introduction

Artificial intelligence refers to the intelligence displayed by machines manufactured by humans. The scope of discussion and research is very wide, including: deduction, reasoning and problem solving, knowledge representation, planning and learning, natural language processing, machine perception, machine socialization, Creativity, etc [1-3]. The "machine learning" we often hear is part of artificial intelligence, and "deep learning" is another part of machine learning.

2. Design Method for WSN

According to the ability of machines (computers) to process and judge, artificial intelligence is divided into four levels as follows:

2.1 First level AI: automatic control

The first-level artificial intelligence means that the machine (computer) has automatic control functions, which can detect the external temperature, humidity, brightness, vibration, distance, image, sound and other signals through the sensor, and automatically make relative comparisons through the control program Responses, such as vacuum cleaners, air conditioners, etc., are actually computer programs that contain automatic control. The programmer must first consider all possible situations before writing a control program. It is not really "smart" [4]-[6].

The first level of artificial intelligence is like working-study students in the company: it just executes the orders the boss confessed, performs various repetitive tasks, and does not think about whether the order is correct, for example: the boss said to move the big box to the words " Big" area; small boxes are moved to the "small" area, and work-study students follow the instructions of the boss.



2.2. Second level AI: exploring inferences and applying knowledge

The second level of artificial intelligence refers to machines (computers) that can explore inferences and apply knowledge. It is a basic typical artificial intelligence. It uses algorithms to associate input and output data, which can generate a very large number of permutations and combinations of input and output data. Applications include puzzle parsing programs, medical diagnostic programs, etc.

The second level of artificial intelligence is like employees in the company, who can understand the rules and make judgments that the boss confessed. For example, the boss said that boxes are classified according to the length, width, and height of the box, and use knowledge to pay attention to different types of goods: be careful, fragile, easy For combustible items, employees will measure the size of the boxes and classify them according to this meaning, and they must determine which goods are "fragile" or "flammable".

2.3. The third level AI: machine learning

The third level of artificial intelligence means that the machine (computer) can learn how to associate input and output data based on data. "Machine learning" refers to the machine learning rules based on the input data. Possible applications include search engines and big data analysis. Wait.

The third level of artificial intelligence is like a manager in a company, who can learn principles and make judgments on his own. For example, the boss gives the judgment principle (characteristic value) of a big box and a small box. Let the manager learn how to judge how big a big box is? Based on past experience, the manager thinks about how big a box is "big"?

2.4. Fourth level AI: deep learning

The fourth level of artificial intelligence means that the machine (computer) can learn by itself and understand the "feature value" used to represent data in machine learning, so it is also called "feature expression learning". Possible applications include: Google teaches computer cat features . The fourth level of artificial intelligence is like the general manager of a company, who can discover rules and make judgments. For example, if a box is large but round (characteristic value), it should be dealt with separately from other goods.

The third level (mainly refers to machine learning) and the fourth level (mainly refers to deep learning) are not easy to distinguish. In fact, deep learning is developed from machine learning. The main difference is that the third level of artificial intelligence processes data. The "eigenvalue" must be told to the machine (computer) by humans; the "eigenvalue" of the fourth-level artificial intelligence processing data can be learned by the machine (computer) itself, which is a great breakthrough in artificial intelligence.

The history of artificial intelligence

Since mankind invented the first computer, the development of artificial intelligence has begun. It has been more than half a century and has experienced three crazes during this period. Each time it was unable to break through due to certain technical difficulties, let's introduce it first. Let's take a look at the history of artificial intelligence development, the reasons for the rise of each craze, and the difficulties encountered.

2.5. The first boom (1950~1960)

Beginning in the 1950s, it mainly used computers to search and infer specific problems and solve them. However, computers at that time had limited computing power and were helpless when they encountered complex problems. They were jokingly called artificial intelligence that could only solve toy problems. So it cooled down in the 1960s.

2.6. The second boom (1980~1990)

Beginning in the 1980s, it was mainly to input the knowledge of a large number of experts into the computer. The computer judges the answers according to the user's questions. The expert system is used in disease diagnosis. If there is a judgment error in a continuous problem, a wrong result will be obtained, and the knowledge is infinite. It is endless. It is impossible to input all the knowledge into the computer and find out the order of all the knowledge. Therefore, it finally became impractical, and it cooled down in the 1990s.



2.7. The third boom (2000~now)

Since the beginning of development in the 2000s, due to the advancement of semiconductor technology, a great deal of computing power has been improved, and the cost of semiconductors has fallen, and the use of cloud storage has become cheaper. The cloud server has collected "big data" from all over the world. It has established a good foundation for the development of artificial intelligence. Among them, machine learning is to train the computer to "learn" the characteristic value of data through big data; deep learning is to train the computer to "understand" the "feature value" of the data through big data. It is "Feature Expression Learning".

Due to the advancement of semiconductor technology and the decrease in cost, the storage and calculation of large amounts of data has become easier, providing an excellent development environment for artificial intelligence. According to the current development of the entire technology industry, we do not have to worry about the cooling of artificial intelligence this time. On the contrary, we should worry about whether the excessive development of artificial intelligence will one day have a negative impact on us.

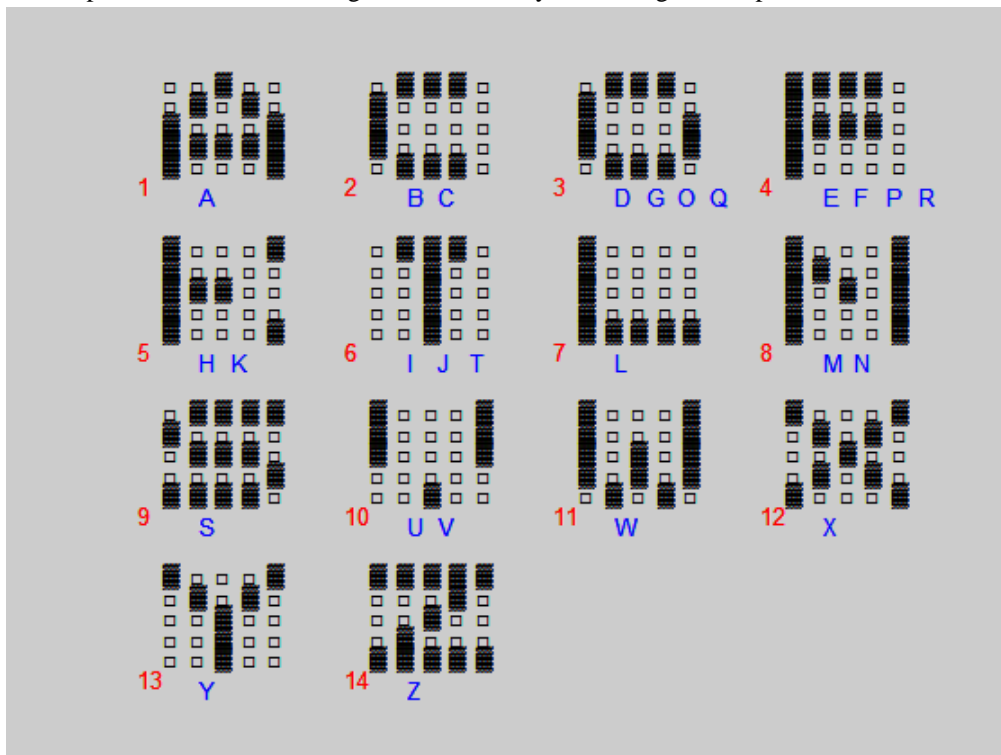


Figure 1: The results of the simulated English alphabet classification

3. Experiment Results

A large amount of artificial intelligence learning and computing are currently carried out with the help of powerful processors in cloud servers. In the early days, Intel's "central processing unit (CPU)" was used. Later, scientists discovered Nvidia's "graphics processing unit (GPU)" performance is more than 100 times higher than that of CPU. Intel acquired the "field programmable gate array (FPGA)" technology through the acquisition of Altera to compete with GPU. In addition, more manufacturers began to develop "specific Application specific integrated circuit (ASIC)", for example: Google's self-designed "tensor processing unit (TPU)" or Intel's self-designed "vision processing unit (VPU)", Is an integrated circuit developed for the "specific application" of artificial intelligence. These processors are all installed in the "cloud." However, not all applications are suitable for sending big data to the cloud for processing. For example, autonomous vehicles must be processed on the "terminal" in the car to respond to road conditions in real time.

The iPhone X launched by Apple this time uses a self-developed A11 processor with a built-in dual-core "Neural Engine (NE)", which specializes in machine learning, inference models, and algorithms related to image recognition. An integrated circuit developed for the "specific application" of artificial intelligence. The difference is that it is installed on the "terminal", which is the user's mobile phone, so that the mobile phone can



"automatically learn" to recognize the user's facial features. Apple has also repeatedly emphasized that all facial features of users are completed in the mobile terminal and will not be uploaded to the cloud for processing, so there is absolutely no doubt about data leakage. The iPhone X released by Apple this time allows users to truly experience the artificial intelligence (On-device AI) of terminal devices. In the foreseeable future, how will the processor of the terminal combine with artificial intelligence to form "edge intelligence", It will be an increasingly popular topic. The results of the simulated English alphabet classification are shown in Figure 1.

4. Conclusion

In this paper, the computer cannot connect (ground) a symbol (word or vocabulary) with the meaning it represents. This is called the "symbol grounding problem". In other words, it is difficult for computers to understand what we call "meaning" and therefore cannot produce "wisdom."

For example, for a person who has never seen a zebra, as long as we tell him there is an animal that looks like a horse but has stripes on its body, called a zebra. When this person sees a real zebra, he will know immediately: This is probably the so-called zebra! Because he understands the "meaning" of the two symbols (words) "horse" and "stripe".

Humans can expand the "meaning" represented by "symbols", but when computers use symbols, they must be within a certain "frame", that is, users must pre-define and clearly tell the computer that a symbol represents something. This is artificial The most difficult place for wisdom.

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