Application of "Circle" Thinking in the Field of Artificial Intelligence

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Abstract: In the final analysis, deciduous leaves not only nourish big trees with nutrients of leaves, but also nourish leaves with energy of big trees. In daily life, garbage is recycled and turned into treasure to solve the problem from the root. These are all "circle" thinking concepts (the advanced thinking mode that uses the methods related to the causes of the problems before the problems arise to do a good job of coping measures in advance so as to reduce costs and losses). It is a method of solving problems from the source of the problems. Life is everywhere, but at present few people combine it with artificial intelligence. Based on the characteristics of artificial intelligence, this paper explores the role of "circle" thinking in artificial intelligence on the characteristics of "circle" thinking.

Keywords: "Circle" thinking; Artificial intelligenc

1. Introduction

"Circle" thinking is an advanced thinking mode, which uses the methods related to the causes of the problems before the problems arise, to do a good job of coping measures in advance, so as to reduce costs and losses. It is a way to solve problems from the source of problems.

2. Application of "Circle" Thinking

2.1. Artificial intelligence

What is artificial intelligence?

Artificial intelligence (AI) is a new technological science that studies and develops theories, methods, technologies and application systems for simulating, extending and expanding human intelligence. This is the explanation above Baidu Encyclopedia.

In computer science, artificial intelligence, sometimes called machine intelligence, is the intelligence displayed by machines, which is in sharp contrast to the natural intelligence displayed by human beings and animals. Computer science defines AI research as the study of "intelligent agents": any device that can perceive its environment and take action to maximize its success in achieving its goals. Generally speaking, the term "artificial intelligence" is used to describe a machine that imitates the "cognitive" function that humans associate with other human thoughts. Such as "learning" and "solving problems". This is the explanation on Wikipedia.

Although Baidu and Wikipedia have very different explanations, they have a lot in common. They all use the word imitation. In general, it is to make machines think like human beings.

Since the term "artificial intelligence" was first introduced in 1956, scientists have tried various ways to achieve it. These methods include expert system, decision tree, inductive logic, clustering and so on, but they are all false intelligence.

There are three waves of AI in history, the first one is what happened in 1956. The second wave is the emergence of expert systems that can use the knowledge of human experts and solve problems in this field. In the past 60 years, the development of AI has stagnated for a long time. The main reason is that the previous methods are not "true intelligence", because the analysis process inside them is very clear and the difference is only the size. This phenomenon knows that the emergence of artificial neural network has changed, its internal is a black box, like our human brain, we do not know its internal analysis process, we do not know how it recognizes the face, nor how it defeats the world champion Go. This caused the third wave of AI.

That's the terrible thing about AI, because it can do things that humans can't do, and humans don't know how they can do it. For this reason, many safety associations have been set up in the world to prevent AI.

Although the threat theory of artificial intelligence is endless, the trend of developing artificial intelligence is inevitable. In the next twenty or thirty years, ignorance of AI may be as illiterate as it was before. In July 2017, the State Council issued the New Generation of Artificial Intelligence Development Plan, which is the first system deployment document issued in the field of artificial intelligence in China. It describes the grand blueprint of the development of artificial intelligence in China in the next decade. It focuses on the overall thinking, strategic objec-

tives, main tasks and safeguards of the development of new artificial intelligence in China in 2030.

Case-based reasoning technology originated from the description of Roger Schank in Dynamic Memory of Yale University in 1982. It is an important knowledge-based problem solving and learning method emerging in the field of artificial intelligence. It solves problems by reusing or modifying previous solutions to similar problems. This is the embodiment of "circle" thinking. Case-based reasoning can extract useful case features from the case base and retrieve cases with the same case features as many as possible to solve new problems. At the same time, it generates new cases to be retrieved in the following case reasoning, which can assist decision makers in analyzing experience and data, and predict future state and behavior, so as to improve the effective utilization of case knowledge.

R4 model is one of the most popular models in CBR. It usually includes four steps: case representation, case retrieval, case revision and case learning.
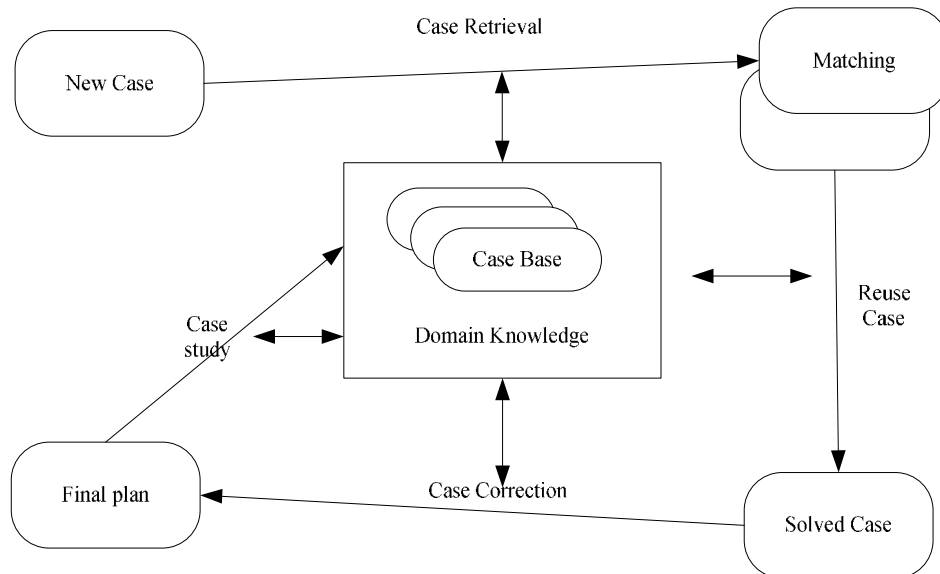

Figure 1. Case-based reasoning model

Case representation is to describe the relevant knowledge in a structured form. Choosing which method of case description will have a great impact on the efficiency and performance of the whole case. Many methods can be used for case representation. It is generally believed that as long as they are applicable to knowledge representation, they are usually also applicable to case representation. Case retrieval is a very important process of CBR, which directly affects the efficiency and results of CBR. It is also the research focus of experts and scholars in CBR process. At present, there are abundant case retrieval methods, among which decision tree method and nearest neighbor method are most commonly used. High similar cases, but the natural factors and social environment are changing rapidly, it is difficult to ensure that matching cases and the problem to be solved are completely consistent, so different solutions will inevitably be formed. Based on this, it should be amended with other methods. Case-based learning refers to case-based learning, in which the final solution of a new problem is saved to the case database for the reference of subsequent problems, so that the case and knowledge of reasoning system are continuously supplemented and improved. Therefore,

case-based learning steps embody the self-learning and self-adaptive characteristics of case-based reasoning.

The key of CBR technology is to use a good case retrieval method. Firstly, rough set is used to reduce case feature attributes and to simplify the initial data. Then, the nearest neighbor method in data mining technology is used, that is, according to the value type of case feature attributes, distance-based metric calculation method is adopted. At the same time, information entropy and hierarchical analysis are used synthetically. The method determines the weight to adjust the distance measurement, so as to realize the retrieval of similar cases. This is also an application of "circle" thinking.

Case-based reasoning technology has been used in many fields, such as industrial park exhaust pollution.

Traceability of exhaust gas pollution is a difficult problem in the air management of industrial parks. Case-based reasoning for traceability of exhaust gas pollution is used to construct a generic ontology model for case representation. In the process of case retrieval and matching, a dynamic correlation model of complex network is proposed, and the concept of contribution degree of traceable impact factor is defined. Calibration is carried out,

and similarity calculation is carried out by using intuitionistic fuzzy rough set algorithm to find the best matching case.

In addition, case-based reasoning is also used in the prevention of mental health of College students.

The "White Paper on Mental Health of Urban Residents in China 2017" analyzed the mental health status of 1.12 million people in China. It was found that 73.6% of them were in Sub-mental health, 16.1% of them had different degrees of mental problems, and only 10.3% of them were in mental health. Among a large number of people, the mental health of college students is very unoptimistic. The psychological crisis cannot be ignored in the negative impact of College Students mental health. Frequent accidents are the external manifestation of psychological crisis. It has become a top priority to intervene effectively in college students and prevent and manage psychological crisis. Prevent psychological crisis intervention, combining teaching with pleasure, learning psychological knowledge in happiness. In recent years, the application of knowledge management in schools has attracted wide attention, and the research field is very extensive. But can the concept and technology of knowledge management be applied to the psychological crisis intervention of colleges and universities? To realize the sharing of psychological crisis knowledge in Colleges and universities, improve the ability of teachers and students to intervene in psychological crisis, and ultimately promote the healthy development of colleges and universities. In order to provide theoretical and data support for the construction of college students' psychological crisis knowledge management system. Based on the concept of knowledge management of case-based reasoning, the feasibility and necessity of its application in college students psychological crisis intervention are analyzed. The construction and implementation of the system are based on the preventive intervention system of psychological crisis and case-based reasoning technology. It mainly aims at the psychological crisis of knowledge learning and education. On the one hand, it provides case-based learning and reflection for students and teachers. On the other hand, teachers provide the basis for crisis decision-making by means of case retrieval, case revision, case review, case release and accumulation of case modules. It can be said that the construction of the system provides a platform for college students and teachers to acquire, share, exchange and innovate psychological crisis knowledge. It is the embodiment of the psychological health education concept of "helping others and helping themselves", which helps college students to prevent, discover and treat early psychological crisis, and fundamentally prevent the occurrence of psychological crisis of College students.

This is the complete realization of the "circle" thinking. Students' problems produce cases. Teachers and teachers

enrich the case database retrieved by case reasoning with the help of case retrieval, case revision, case review, case publishing and accumulation of case modules, and provide case characteristics for solving deeper problems. It can solve the problem fundamentally, reduce the cost and improve the efficiency.

Big emmeton gave the definition of knowledge cascade elements: (1) data facts and figures. (2) Information is a factual description of data and meaningful data. (3) The ability of knowledge to translate information and data into action. Information and its process requirements are relevant and individualized. (4) Wisdom and insightful knowledge are often used to express people's ability to understand the laws of knowledge and to create new knowledge. When we understand the basic elements and principles of knowledge cascade, we can make better use of case-based reasoning technology to analyze the characteristics of cases and solve more and more difficult problems.

2.2 In other areas

The twelve principles of green chemistry (prevention of pollution is better than treatment after pollution), that is, when designing reaction process, by-products are used as far as possible in the process or in other processes of the same plant, which clearly reflects the "circle" thinking. Before producing by-products, the utilization and treatment of by-products are taken into account in advance, so as to reduce costs and improve atomic utilization efficiency. Dow's Dipheny l Carbonate synthesis design circuit patents and processes is the best embodiment of the "circle" thinking.

In economics, the way of pollution control by tax policy of promoting circular economy is also a "circle" Thinking, that is, using high taxes to increase the cost of enterprise sewage discharge and reduce the amount of enterprise sewage discharge Economic means are used to reduce the economic losses caused by pollution control before pollution is caused. This is very advanced and has many advantages.

The "closed-loop system" of circular economy is also the "circle" thinking. Circular economy (closed-loop system) is an improvement of linear economy (open-loop system). The behavior of linear economy (open-loop system) follows the hierarchical structure of 6R. It prefers reuse, remanufacturing or recycling solutions rather than processing (also known as "linear dead end"). For circular economy, the "circle" thinking has more advantages.

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