

# Technological Analysis on Intellectual Development and Potential of Computer

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**Keywords:** Computer intelligence, Technology, Development

**Abstract.** Computer intelligence technology is also known as artificial intelligence technology which is an integrated new technology. With the rapid development of computer technology, simulating human brain activities by CPU chip is becoming true. The intellectual development potentials are great, particularly the expert system, natural language processing and image identification of the artificial intelligence are of greatest potentials, and are the key to breakthrough artificial intelligence. This paper analyzed the application of computer intellectual technology and the development of future potential technologies.

## Basic conception of computer intelligence

The so-called computer intelligence is the antonomasia of artificial intelligence, which mainly aims to study whether the machine can achieve human intelligence thinking. This is a comprehensive subject, includes comprehensive application of various subjects, such as philosophy, computer science, psychology, etc. But from the narrow point of view, computer intelligence technology is a branch of computer science, which aims to make the computer achieve human intelligence, thereby allowing the machine to engage in human work. The development of computer intelligence technology is inseparable from the development of computer technology. In the last century, computer intelligence is just a theoretical concept, but nowadays, as the computer technology has made major breakthroughs one after another, the computer intelligence technology has already entered the stage of substantive research and has been achieved and even beyond human intelligence in many areas, which has made an important contribution to the economic development of related industries as well as improved the level of human life

## Development history of computer intelligence technology

### Early development of computer intelligence technology

Since the concept of artificial intelligence has been proposed in 1950s, a large number of important research results have been achieved at that time, such as machine theorem, Chinese checkers application, LISP (list processing languages), etc. Due to the major problems happened to the machine translation, in addition to that the computer technology at that time was mainly used for mathematical calculation, and consequently, after a short active period, computer intelligence technology felt into a trough. However, it is the study on computer intelligence technology at that time that the machine translation language was born, and realized controlling computer by low-level assembly language, and finally developed into high-level language of C language

### Medium-term development of computer intelligence technology

This is a connecting link period between the preceding and the following development history of computer intelligence technology. After the bottleneck of early development of computer technology, in the early 1970s, expert system, such as chemical mass spectrometry systems, prospecting system, etc. Was emerged, and consequently, computer intelligence technology realized practical application. However, due to the limitation in computer technology, these expert systems were not popularized widely. At that stage, fifth-generation computer was successful developed and realized computerization on logical reasoning and numeric calculation which greatly improved the intelligent

processing speed. Although the application on computer intelligence technology was failed, it promoted the rapid development of computer technology.

### **Computer intelligence technology has been widely applied due to the rapid development in neural network**

Neural network has been studying since 1987 after the birth of the computer networks. Nowadays, neural network has almost become the basis of computer intelligence technology. Artificial intelligence technology begins to present as distributed neural network, developing one intelligent agent from multiple intelligent agents. Due to the emerging of Hopfield multilayer neural network model, computer intelligence technology starts to develop rapidly, and machines become more and more intelligent. The moment that the IBM's Deep Blue defeated the world champion of international chess in human world, a major breakthrough in computer intelligence technology research was announced.

At present, the research field of artificial intelligence starts to transfer to intelligent interface, data mining and multi-agent systems. The intelligent interface technology mainly aims to study how humans realize natural communication and interaction with machine, i.e. Make machine simulate human in accessing to outside information and conduct intelligent processing, such as, be able to understand human language, understand human text, even translate languages through computer, etc. These intelligent technologies mainly depend on the research on knowledge expression methods, and the widely applied technologies of voice recognition, image identification, character recognition, natural language comprehension, etc. Are actually the branches of these knowledge expression methods, and these branches has been widely applied in various fields.

## **The application and development of computer intelligence technology**

### **The intelligence technology application in management system.**

The modern management information system in enterprise is a demonstration of computer intelligence technology to some extent, which not only improved the efficiency of enterprise management but more importantly it effectively solved information analysis that was difficult to be solved by human through processed a large number of computer information. These huge amounts of data information generally need to be completed by thousands of people in thousands of years, however, which can be processed by the computer management system very soon. Nowadays, many enterprises prefer to establish a data processing center platform as the management system. All business, management modules and workflow within the enterprise are able to build individual subject databases, and all the application of the enterprise can be processed by these subject databases, therefore, accurate decision-making and efficient business management in enterprises can be achieved much rapidly and accurately.

In the intelligent teaching system, it is a model of the combination of computer intelligence technology and education, as well as an important direction for future development of the teaching system. Nowadays, with the rapid development of information technology, the development of the teaching mode and the exploitation of new teaching mode have promoted the comprehensive application of hypermedia technology, network technology and computer intelligence technology. The main modules of computer intelligent teaching system include student module and teacher module. The man-machine interaction between these two modules is realized by intelligent interface technology, which can improve the operating efficiency of the system.

### **The widely application in engineering field**

It is hereby mainly taking medical expert system and prospecting expert system for instance. Medical expert system is a model of combination of computer intelligence technology and expert system theory, in which the intelligence technology, expert system and medical science are integrated, playing an essential role in solving complex problems for the doctors, and now it has become an important tool for doctors in diagnosis and treatment. Actually, the modern medical expert system has been developing since the 1980s, and now has developed from single intelligent agent into an intelligent system with multi-intelligent agents of distributed neural network, in consequence, it is

more perfect in logical processing and man-machine interaction. Besides, it is of great importance in the diagnosis and treatment of internal medicine department and orthopedics department. With the development of new computer intelligence technology, the medical expert system will be increasingly important.

Another important expert system is the prospecting expert system. As artificial calculation methods in exploration & evaluation, the selection of well drilling location and value assessment of resource were greatly restricted, the prospecting expert system are used to simulate the structure of the mining area and mineral resources, and accordingly analyze the appropriate location of the well drilling, which is conducive to carry out the prospecting work.

#### **The application in technology**

The application in technology is mainly reflected in two aspects: detecting technique and electronic technique. The application in detecting technique is mainly adopt the defects and shape in the ultrasound injury to judge and classify, which can be highly accurately operated through computer intelligence technology. Replacing human brain with computer intelligence technology to conduct a large number of logic operations, as the accuracy of computer intelligence technology is higher. In addition the operation results can be intelligently analyzed by intelligence technology, realizing intelligent and automatic evaluation on test results.

The computer intelligence technology has been applied in electronic technique for long time, especially the computer network security technology has been used for intercepting virus invasion through intelligence technology. Nowadays, through research on knowledge base, it starts to intelligently research the characteristics and potential variant of the virus, to realize precaution and invasion of the unknown virus, which is bound to produce a very significant impact on the computer security technology

### **Research on the potential technology of computer intelligence**

#### **Potential development in expert system**

The expert system is the fastest developing and most effective field in computer intelligence technology. Through combining with the intelligence technology of different industries, the expert system avoided huge differences that existed among a wide range of industries, which made the realization of intelligence technology complicated and made the integration of single industry in intelligence technology relatively easier and more efficient. The intelligence technology of expert system integrate the rich experience of various experts into computer intelligence technology, which granted the machine with the capacity of many experts and helped to solve the problems. The reason that IBM's Deep Blue was able to defeat the world's chess champion is because that Deep Blue possesses the experience and knowledge base of the champion. Therefore, improving the development and wide application of computer intelligence technology through developing the expert system has become the research focus of current intelligence technology.

#### **Potential development in intelligent retrieval technique**

We have entered the era of information explosion, and the quantity of information will be steadily on the increase in the future. How to quickly positioning the required information among the tremendous amount of information has become the key problem needing solving, and computer intelligent technology is an important mean to solve this problem, which is mainly reflected in the following three aspects:

Firstly, emphasize on studying out the methods and techniques by which computer hardware and software systems can simulate and expand the human intelligence. This is the key to intelligent retrieval and the current theoretical knowledge began to mature. Secondly, analyze the regularity of knowledge information through intelligence technology. Although the at present, the information on the whole was featured with vagueness, randomness and unreliability, and so on, it is these features that reflected the importance of computer intelligence technology. Computer intelligence technology is able to efficiently analyze the potential regularity from this information to realize intelligent retrieval that can interactive with human.

### **Potential technology of soar intelligent architecture**

Soar is a commonly used intelligent architecture and this kind of architecture has become the researched frontier science of computer intelligence technology since the date of birth. Its powerful ability in solving problems can transform a machine into a robot, which is just a concept, instead, it has been implemented in many fields. There are four major basic concepts in soar intelligent architecture. Firstly, the robot do not responsible for describing the abstract conception, instead, it processes the direct actions, which is able to efficiently reduce the complexity of intelligence technology, eliminate numerous minor details and keep the research priorities. Secondly, on the whole, the robot possesses the main physical characteristics of human being and able to feel the surrounding information in the world and intelligently transform the information into experience and feedback through experience hereafter. Thirdly, the robot's intelligence source not only depends on the computing power but also depends on interaction ability among the robot, surroundings and information. Fourthly, intelligence emerges in the interaction between the intelligence system and surroundings and the intelligence emerges in the interaction among the components of the intelligence system. Just so, soar intelligence architecture realizes the intelligent computer from the true meaning and this is also the major reason that many experts and scholars conduct in-depth study on soccer robot system. The soccer robot involves many fields, such as computer intelligence technology, life science, intelligent control, etc. Which possesses obvious soar intelligence architecture. It is concluded that the soar intelligence architecture will become the research priority of computer intelligence technology.

### **Conclusion**

The development of computer intelligence technology is an irresistible trend. Although there are incessant worries about its development in the international in that the computer will challenge the human's ruling right, even the Hollywood films reflected the potential risks will be brought by the development of computer intelligence technology through the war between robots and human beings, from the scientific point of view, the computer intelligence technology is nothing but good for human beings in the long term, and the so-called robots' revolution is just the writers' imagination. In addition, with the rapid development of computer technology, artificial intelligence theory continues to mature, perhaps one day we will have a robot to help us to do a lot of work. In fact, nowadays, many factories had already replace workers' rehandling by robots and saved a lot of costs for enterprises.

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