

## Research on Computer Science and Artificial Intelligence

Qi Wang<sup>1, a</sup> Xinyang Wang<sup>1, b</sup>

<sup>1</sup>Shenyang Ligong University, Shenyang, Liaoning, China, 110159

<sup>a</sup>email, <sup>b</sup>email,

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**Abstract.** Since the first digital computer generated, artificial intelligence has been 50 years of development history. But AI did not stop and on the contrary, it has rapid development as always. AI takes computer as the core. The popularity and the expanding of the application range of the computer are changing our world and network technology will allow us into the digital information age. People continue to face a lot of new situations and new problems need to be explored at work, social life and other activities, so this article focuses on the relationship between computer science and artificial intelligence.

### Introduction

1950s with the emergence of the first modern computer, the rise of artificial intelligence emerged some research results, such as machine theorem proving, general problem solving program LISP list processing language, checkers and other programs, but by the late 1950s into the development bottleneck period. In the early 1960s, the emergence of artificial intelligence expert system enables further development until the late 1970s. The main findings of this period is MYCIN disease diagnosis and treatment system, the emergence and maturity Hearsay-II speech understanding systems, PROSPECTIOR DENDRAL chemical prospecting system and mass spectrometry systems, artificial intelligence, expert systems put into practical development of roads .

In 1982, Japan began the "fifth generation computer development program", setting off a wave of artificial intelligence research, so that artificial intelligence has been greatly developed in the 1980s. In 1987, the United States held its first international conference on neural networks, then countries have stepped up research on neural networks, so that the rapid development of the neural network, greatly enhancing the efficiency of information processing, laid the foundation for the further development of artificial intelligence.

1990s, with mature international mutual networking and application technology, artificial intelligence research object starting from a single-agent multiple-agent network steering environment, pay more attention to the entire network environment, more three-dimensional and comprehensive. Not only can answer the problem of artificial intelligence distributed based on the same target, but also to answer based on multi-objective problem solving network environment, greatly enhance the usefulness of artificial intelligence, intelligence. The development of multilayer Hopfield neural networks, artificial intelligence is to further expand the range of applications.

### The Overview of Artificial Intelligence

Artificial intelligence, as an important branch of computer science, by McCarthy in 1956 in Dartmouth Institute formally proposed in current known as one of the world's three cutting-edge technology. The famous Artificial Intelligence Research Center, Stanford University Professor Nelson define AI "Artificial intelligence is about subject knowledge - how to represent knowledge and how to acquire knowledge and use of subject knowledge", another famous American university MIT's Professor Winston that "AI is the study of how to make the computer do the work of the past only smart people can do." In addition, there are many definitions of artificial intelligence, has not yet unified, but these claims reflect the basic ideas and elements of artificial intelligence, artificial intelligence can thus be summarized as the study of human intelligence activities of the law, construction It has some intelligent behavior of artificial systems.

## **Computer Science and Its Development**

One reason for the rapid development of computer technology is to create continuity of activity often occurs. Real demand-driven, on the development of computer technology recognize or part of computer science, information sharing can be used to explain the creation of regular activity.

It reduces the creation of obstacles to the Second World War the urgent need for information, so that resources can be applied to basic technical tests and promotes the emergence of the computer. The early stages of the institutes, large companies, universities and government demand for scientific computing computer quickly led to civilian use, into industrial products, and promote the development of the computer industry. With the universal application of computer science and technology and other cutting-edge science technology and engineering (analysis such as mathematics, physics, mechanics, chemistry, astronomy, crystal structure, oil exploration and development, bridge design, geodesy, etc.), the computer's performance capacity is also put forward higher requirements, so the creation of regular activity, continuity appears. In the computer industry, according to the technical track one step ahead of the introduction of new computer technology products could mean early market share. Competitive pressures and profit maximization requirements are often reflected in the development of technology as: advances in computer technology than the actual market demand for faster development. This is undoubtedly a creative activity rate, speed time to put forward higher requirements.

## **The Related Research of Computer Science and Artificial Intelligence**

Artificial intelligence collection disciplines of computer science, linguistics, psychology, physiology, is extremely challenging integrated technology, artificial intelligence technology main goal is to make a machine to obtain artificial intelligence to replace human beings to complete some complex work and thus improve the efficiency of society. Because artificial intelligence technology is a multi-disciplinary integrated application technology, its development is closely linked with various disciplines, particularly the development direction and trend of computer network technology is artificial intelligence plays a very important and decisive role, especially in recent years, the interaction has a very significant development of relations between both artificial intelligence and computer network. .

**Intelligent Interface.** The main objective of the study is to make intelligent interface that people naturally and easily communicate with the computer. To achieve this goal, we need a computer can understand the language, understand and be able to speak the text expression, or even be able to complete the translation between different languages. Today, artificial intelligence techniques in machine translation, text recognition, speech recognition, image recognition and speech synthesis, etc., have made a breakthrough effect.

**Data Mining.** Data mining generally has three steps, followed by data preparation, data Looking law and the law of representation. First, the data from the data source is ready to select among the data needed, and integration as data mining can be used for such a database. Then, regular data to find some way with some regularity in the database implied excavated. Finally, as far as possible to use the law of representation it is to be understood that the form of the people expressed in the law.

**Body and Multi-Body Systems.** In artificial intelligence technology among the general representation of the body are those autonomous entities with aspirations, beliefs, capabilities, choices, intentions and other mental states but also has a certain degree. Body can interact with the environment, and the ability to communicate with other body, and thus able to achieve the goal to complete the work under the control of artificial intelligence. Multi-agent system, the main research is to conduct a plurality of separate body to coordinate intelligence between the way the body tries to be rational human behavior simulation, currently used to simulate the real world and the world, as well as intelligent mechanical robot these and other areas.

## The Development Direction of Artificial Intelligence

**Symbolic Computation.** With the popularity of computer technology and the development of artificial intelligence, and now, the continuous emergence of a variety of computer algebra system-related software, as well as the symbolic computation, graphics, numerical computing, the perfect combination in one of the mathematical system software, enables the user to conveniently the flexibility to complete the processing of various forms of mathematics. Today, the symbolic computation system software have the following common characteristics: capable of symbolic computation, graphics display, and numerical computing, the general also has programmable functions. On the software interface are often able to support interactive form of treatment, done through the keyboard command input, the computer can display the output after processing.

**Expert System.** Expert system, which is a program system with rich practical experience and a lot of expertise, the main use of computer science and artificial intelligence technology, relying on experience and knowledge provided by experts in a certain field, thus achieving judgment and reasoning, to simulate human experts resolved choice, decision-making process, in order to achieve the required expert handling such complex problems. Expert systems can handle the initial information input, the application of professional knowledge to achieve reasoning and judgment and decisions, this expert system level solutions to problems have been able to be close to or even reach the level of a human expert, therefore, they are generally able to play expert or specialist role of assistant.

**Pattern Recognition.** With the rapid development of computer science and technology, human beings may in-depth study of extremely complex and tedious process of information, the use of computer technology to achieve mode (object, character, voice, text, etc.) automatic recognition, which is the artificial intelligence technique to develop critical breakthrough. In the form of information processing is a very important life on automatic identification of objects and the environment, in human terms, it is extremely important to identify the acoustic information and the optical information. Meanwhile, the main features of the computer identification are of high efficiency, high accuracy and speed.

Currently the pattern recognition focused on image recognition and speech recognition. Pattern recognition to identify the various aspects such as printed and some handwritten text, and so on fingerprint recognition, white blood cells and cancer cell technology has entered the practical stage. The main classification of various speech recognition and speech signal. Speech recognition technology has developed rapidly in recent years and it is now a commercial product such as a scanner listed.

**Machines Emotion and Artificial Neural Network.** The basic idea of artificial intelligence technology has been used in many fields of technology widely used, and artificial neural networks will undoubtedly become the future development of the new field of artificial intelligence technology, the future composition of intelligent computers is likely to be as Artificial Neural Network the perfect combination of intelligent peripherals and von Neumann-type host.

Artificial neural network, the processing of information from the interaction between neurons to achieve the storage performance of knowledge and information between network elements for the interconnection of distributed physical contact, learning and recognition depends on the network and neurons dynamic evolution of connection weights.

**Machine Learning.** Machine learning is the machine themselves access to knowledge. Research on machine learning is mainly the mechanism of human learning research, the process of the human brain thinking; machine learning; a learning system for specific tasks. There are problems in this field of robotics research, ranging from the best move of the robot arm to achieve the goal of the robot motion planning methods like sequence. Therefore, the development of intelligent robot is an important aspect.

**Intelligent Decision Support System.** Decision Support System is part of the management field of science, and it is "knowledge - intelligence" has a very close relationship. Expert system has made since the 1980s in many ways successful, especially in artificial intelligence and intelligent knowledge processing technology in decision support system, expanding the scope of application of

decision support systems to improve the ability of the system to solve the problem, which become intelligent decision support system.

**Natural Language Understanding and Automatic Programming Design.** Natural language understanding has been developed to answer questions in English from the internal database of the program. In addition, these programs by reading text material, which is also able to translate sentences from one language to another language, perform given in English instruction and access to knowledge. The objective of automatic procedures that enable computers to automatically write itself to a computer program based on a variety of different purposes and requirements, both high-level programming language, and English description available algorithms. Now it can automatically write some simple procedures.

## **Conclusion**

Artificial intelligence has been at the forefront of computer technology, its theoretical research and development largely determine the direction of development of the computer. For artificial intelligence technology, we cannot just keep it to see the bright side. When we use artificial intelligence to the benefit of mankind we also should take into account the negative impact it may bring. Computer science and technology itself is not a problem and how to master the use of technology is the key. Only achieve the correct rational use can we be able to make benefits and eliminate defects.

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