Research on the Influence of Network-based Automation Technology and Artificial Intelligence Development on Robots

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Keywords: Artificial intelligence; Automation; Robots; Intelligent algorithm

Abstract: With the rapid development of the times, artificial intelligence, as a branch of computer science, has been widely used. Artificial intelligence has made many remarkable achievements, not only in the expert system which people have always attached great importance to, but also in the artificial neural network and various intelligent algorithms which have gradually risen in recent years. The research of intelligent robots and robotics has greatly promoted the development of many artificial intelligence ideas and technologies. With the emergence and high-speed development of automation technology, robot technology has made great progress. People invent and use different types of robots to serve human beings in continuous exploration. Based on the automation technology of network, in the recent research content of artificial intelligence, this paper further prospects the development trend of application of artificial intelligence in special robots.

1. Introduction

Robot is a familiar word, whether in science fiction, movies and TV, newspapers and magazines, or in real life, the mere mention of robots will arouse people's great enthusiasm and interest [1]. Artificial intelligence is being developed and studied by researchers all over the world. It is one of the three most advanced technologies of human beings. Its application has begun to slowly affect our lives. In action, the robot has become nimble and swift from its past awkwardness [2]. In IQ, the development of artificial intelligence has made great breakthroughs in deep learning and artificial neural networks. Artificial intelligence has made many remarkable achievements. Whether it is the expert system that people have always attached great importance to, or the artificial neural network and various intelligent algorithms that have gradually emerged in recent years, remarkable achievements have been made [3]. As an ultimate application goal of artificial intelligence, robots are often connected with the two. When it comes to robots, it is easy to think of artificial intelligence. Artificial intelligence is a simulation of the information process of human consciousness and thinking [4]. Artificial intelligence is not human intelligence, but thinking like a person may also exceed human intelligence. From the perspective of robots, artificial intelligence is indeed critical to the development of robots.

Intelligent robot is a kind of machine system that fully simulates human beings in memory, perception, reasoning, decision-making, thinking, etc., but its shape is not necessarily like human [5]. The research of intelligent robots and robotics has greatly promoted the development of many artificial intelligence ideas and technologies. It is a comprehensive testing ground for artificial intelligence technology, which can comprehensively examine the technical development of various research fields of artificial intelligence. In the use scenario, the robot can not only undertake the work on the factory production line, but also enter the family, sweeping the floor, watering, Cooking [6]. Functionally, robots can not only replace manual operations, but are now gradually replacing mental work. The main problems currently facing the field of computer artificial intelligence include the difficulty of computer game, the difficulty faced by machine translation, the proof of automatic theorem and the confusion of pattern recognition [7]. In modern software development, artificial intelligence is closely related to robots. Based on the network automation technology, in the recent research content of artificial intelligence, this paper further forecasts the development trend of artificial intelligence in special robots, and also puts forward some ideas and prospects.

  DOI: 10.25236/scmc.2019.077

2. The Development History of Artificial Intelligence and Its Difficulties

Automation can greatly improve production efficiency and work efficiency, save energy and reduce the consumption of raw materials, improve working conditions and reduce the difference between mental and physical labor. The problems faced by machine translation are also urgent to be solved at present. Some people have put forward the idea of using computers to realize automatic translation, but the current computers cannot realize this function. For a long time, we have a misunderstanding about artificial intelligence, how to make the machine smart, let it simulate people and let it think [8]. Automation refers to the production process composed of one or more automatic control systems or devices without direct intervention. Artificial intelligence needs personification. The essence of artificial intelligence is to imitate people's thinking in order to replace human work. Although people are making great efforts to develop intelligent robots now, the attitude towards intelligent robots is not entirely certain. The pattern recognition studied by artificial intelligence refers to the use of computers to replace or help human perception patterns. It is a simulation of human perception of external functions. It studies the computer intelligent pattern recognition system. At present, machine translation is one of the main factors hindering the development of artificial intelligence. It is an important and arduous task to strengthen the design and solution of this problem.

The accuracy and real-time of information are very important, so the design of multi-agent positioning system is the key problem. In order to establish a more practical wireless network channel model and characterize the influence of the distance between agents on the connection weight, the receiving probability is used to represent the connection weight. Fig. 1 is the tracking of AI for agricultural applications.

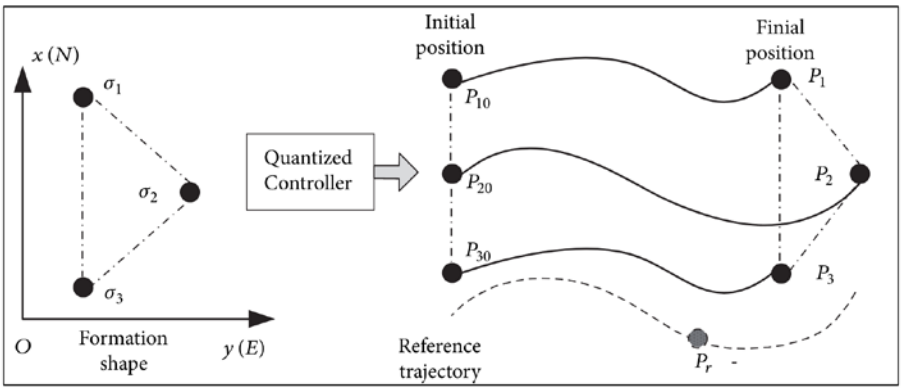

Fig. 1 Agricultural application artificial intelligence tracking process

At present, our technology cannot meet the requirements for the thinking of robots. Now, more and more programs or sensors are used to transmit designated information to the brain of robots for corresponding behaviors and controls. In actual network transmission, the interaction weight of communication topology often changes dynamically with the change of effective distance between receiver and transmitter. To add a new connection edge and change its topological structure, the rigidity of the graph will not be affected. Therefore, if the number of edges in a graph satisfies certain conditions, the rigidity of the graph can be guaranteed [9]. The behavior-based controller consists of a series of behaviors, namely simple basic actions. At present, the goal of artificial intelligence research is to develop robots using computer intelligent systems that extend and expand on the basis of simulating the application of human body structure. In order to achieve this goal, the relevant intelligent system staff should strengthen their own knowledge and skills to understand the principle of putting the intelligent system into actual production. Knowledge is the foundation of intelligence. Only when knowledge is transformed into intelligence can it play a role. With the unlimited accumulation of knowledge, intelligence will play an increasingly important role in human society.

3. Influence of Artificial Intelligence Technology on Robots and Its Application Trend

To study the field of artificial intelligence and robots, we must grasp the application of artificial intelligence from the whole and many aspects. Integrating the existing intelligent systems into the same system can enhance the mutual connection and restrict each other so as to play an overall role and improve the application efficiency. The reasoning function of artificial intelligence robots has been broken through. The learning and association functions of robots are in the research and development stage. How to accurately imitate the fuzzy processing function of human right brain and the parallel processing function of the whole brain is a new field that needs research and innovation at present. The main controller first receives various sensor data acquired from the co-controller and mobile position information acquired by the positioning computer. The controller processes the information and gives instructions. Considering that wireless communication is affected by multipath failure, occlusion and the distance between transmitter and receiver, it is different from the traditional fixed connection weight topology model. A new interactive weight communication topology model is established by introducing the receiving probability, which makes the connection weight change with the distance between agents.

Each behavior has its own goal or task, and its input can be used as the sensor information of the agent or the output of other behaviors in the system. Accordingly, the output of each agent is sent to its actuator to control the formation of the agent. Because of its particularity, multi-agent vision positioning must be able to transmit information anytime and anywhere, monitor and analyze data accurately, and achieve efficient interaction through the network. Data acquisition, visual positioning and data receiving module transmit data through interface. The data format is shown in Table 1.

Table 1 Data format

Name	Length
Starting mark	4
Data length	6
Command word	8
Data section	10
Termination code	7

The experimental simulation considers the factors of total bandwidth gain and system collision probability of the spectrum allocation system and simulates it. The two methods of fuzzy spectrum allocation and random allocation are compared. The specific parameter setting data is shown in Table 2.

Table 2 Simulation parameter settings

Parameter	Parameter value
Number of cognitions	15
Number of free frequency bands	15
Distance	0-20km
Channel bandwidth	220KHz
Mobility	0-90km/h
Discount factor	1.8
Initial weight	5
Learning rate	0.8
SNR	20-85dB

For the individual agent, the optimal path to be searched is along the negative gradient direction of the artificial potential field, that is, the direction in which the function declines the fastest. When the number of agents increases, a single camera cannot satisfy the coverage of the robot's motion space. Aiming at the medium access constraint of the wireless communication network, the intelligent body node scheduling protocol is designed by using binary sequence. And the scheduling protocol is used to schedule the agent node that meets the condition to access the network at the sampling time. Fig. 2 shows the structure of the agent node.

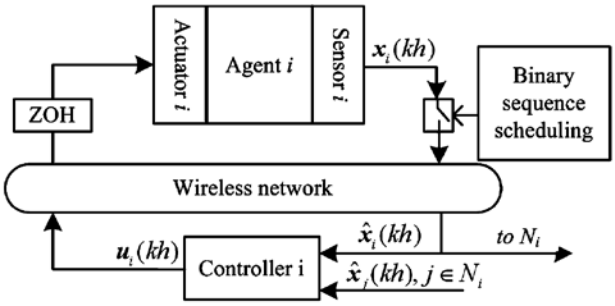

Fig. 2 Structure of the agent node

In the multi-agent positioning experimental system, the function of the controller module is to receive the agent position and environment information, make information decisions and issue control instructions. In order to realize the information interaction between the host computer and the agent, a communication module is designed in the software. Multi-agent formation control generally has large scale and decentralized sensing, communication and control structures. And a network structure associated with each other is formed among the agents. Therefore, the multi-agent system can be naturally modeled as Fig. [10]. In the graph representing multi-agent system, the neighbor vertex of a vertex of the graph represents the set of agents with topological relations such as perception. Therefore, a local, distributed and extensible multi-agent formation control law can be designed from the Laplace matrix of the graph. The stability of formation control law can be proved by means of eigenvalues of Laplace matrix. For robots, computers are their brains. To apply and develop artificial intelligence, people need to constantly improve their brains, make them have many functions similar to human brains, and truly realize intelligence.

4. Conclusion

With the rapid development of Electronic Science and technology, the application of artificial intelligence in the field of robots has made great progress, and the field of science and technology will grow faster and faster in the future. As a new generation of production and service tools, intelligent robots are more and more involved in our lives, thus serving us more. However, some workers who are at the forefront of science and technology are not optimistic about it. The research and application of intelligent robots and multi-robot systems provide a good test bed for the research of artificial intelligence theory. As a branch of artificial intelligence research, robotics and robotics have been paid more and more attention by the research community. The increase of task complexity and the improvement of intelligence and cooperation required to complete the task require robots to evolve from original industrial robots to intelligent robots, and require a single robot to develop into a multi-robot system. The development of artificial intelligence promotes the development of intelligent robots. Its future development will certainly bring many conveniences to mankind, but we should also seriously consider its position in our future life. With the rapid development of automation technology and artificial intelligence technology, the movement of robots will become more and more continuous and intelligent like human beings. I believe the development of robots will be more rapid.

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