Exploration of Artificial Intelligence Security in Multi Unmanned System Cooperation

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Abstract. In modern science and technology, artificial intelligence has become one of the most important and promising technologies in today's society and plays a very important role in people's life. In artificial intelligence, cooperation is a very important research direction, which includes the cooperation between sensors, coordinated man-machine interface and actuators on multiple UAVs. Therefore, based on the exploration of artificial intelligence security, this paper studies artificial intelligence in multi unmanned system cooperation. Firstly, this paper expounds the development of cooperative system, and then describes the purpose of multi unmanned system cooperation. Then, this paper studies the intelligent algorithm applied to the cooperation of multiple unmanned systems in the field of artificial intelligence. Finally, aiming at the existing security problems of artificial intelligence, this paper tests the functions of multiple unmanned systems. The test results show that when multiple unmanned systems work together, the accuracy of artificial intelligence in dealing with things is basically more than 90%. At the same time, it can be nearly 100% scientific, and can budget a variety of treatment schemes. This shows that in the multi unmanned system cooperation, artificial intelligence can almost meet its needs, but it still needs to be further improved.

Key words: Multi Unmanned System, System Collaboration, Artificial Intelligence, Security Issues

1. Introduction
With the continuous progress of society and the rapid development of science and technology, mankind has entered the information age. As an intelligent, efficient and multifunctional computer set, multi unmanned system [1-2]. It has many advantages, such as strong real-time and reliability. It can simulate and analyze the environmental conditions, so as to improve the working ability and reduce the cost. It can realize the combination of multiple functions and parallel processing technology to complete the task. These characteristics make it a comprehensive high-tech integrating high intelligence and automation, which is called "artificial intelligence industry" [3-4].

Many scholars have done research on the intelligent development of multi unmanned systems. Some scholars have proposed interval learning method and sampling method to solve the problem of computational complexity of coevolutionary algorithm. Through function optimization experiments, it
is proved that these two methods can reduce the computational complexity of coevolutionary algorithm while ensuring the evolution results, and apply coevolutionary algorithm to multi-agent. A hierarchical interactive agent architecture based on co evolution and multi-agent cooperation mechanism are designed [5-6]. Other scholars systematically introduced the development trend of intelligent unmanned system, summarized the current development status, made an appropriate outlook for the "cloud brain" network in view of the existing problems and challenges, briefly described its basic working principle and process, and discussed the key technologies to be overcome, providing a preliminary idea for the future development of unmanned system [7-8]. These previous studies have laid an academic foundation for the research work of this paper.

This paper first introduces the basic knowledge of multi unmanned system, then puts forward the optimization design of the scheme by using the fuzzy theory method, and finally obtains the better results, analyzes the reasons, and finds the optimal conditions to meet the security cooperation mode.

2. Discussion on Artificial Intelligence Security in Multi Unmanned System Cooperation

2.1. Collaborative System Development

2.1.1. Collaborative system moves towards mobility
In terms of collaborative system, the essence is collaboration and communication. Mobility can improve work efficiency, and users have a great demand [9-10]. Mobile collaboration, which focuses more on mobile office and collaboration, integrates mobile wireless technology and provides online office support services such as collaborative office, teleconference and enterprise mailbox. Effective collaboration and reduce communication costs. The advantages of mobile collaboration are: first, it is fast, and enterprises can master the business anytime and anywhere. Second, interactivity, enterprises can two-way information transmission. Third, efficient system integration of mobile communication skills to ensure that business information is available anytime, anywhere [11-12].

2.1.2. Collaborative system is more important than service
Today, the information needs of enterprises are not as simple as "spending money on software", but have been placed on software consulting, training, installation and maintenance. The collaborative system industry has fully entered the era of "first-hand price", and differentiated services are becoming the most competitive field. Although the services of suppliers are important, combined with the above characteristics of the mobile and cloud era, the software focuses more on maintenance and downstream services. As long as the supplier has a clear understanding of the concept of service, this service can be reflected. When it understands the exact needs of manufacturers, it can provide customers with customized solutions.

2.1.3. Integration of collaborative system with ERP, CRM
More and more enterprises begin to turn their attention from computerization to collaborative management. The traditional collaborative management software is limited to daily management, such as querying, receiving or sending e-mail, or using instant messaging tools for communication at work, or using communication tools, editing and writing documents, speaking, etc. These tool systems are decentralized and isolated. The integrated overall solution realizes the all pervasive integrated management of customers, sales, operation, production, finance, marketing, customer service and logistics, effectively connects the process until cooperating with OA, and realizes the integrated application of management and service enterprises. It can help customers reduce business operation costs and improve business organization efficiency.

2.2. Purpose of Multi Unmanned System Cooperation
Unmanned systems mean that there are no operators. For example, UAV is the most typical application. The UAV uses aerodynamic flight, can be controlled and controlled independently or
remotely, can be expanded and recovered, and can carry an unmanned flight platform with payload. Compared with manned aircraft piloted by pilots, UAVs have many potential advantages. "Unmanned" will gradually change the face of modern war. Become an important hub supporting future information warfare and lead the development of future warfare in a new direction. In the field of civil and scientific research, UAV plays an increasingly important role and has become an indispensable technical assistance project to help people explore nature, improve social security and participate in rescue and disaster relief. With the extensive popularization of unmanned technology in recent years, unmanned system has attracted extensive attention in various fields. It can be seen that the future development trend of unmanned technology is related to the comprehensive application of multiple unmanned systems on earth, sky, sea and air. The global promotion of unmanned system technology will affect the future of mankind in a more comprehensive and complex way.

2.3. Artificial Intelligence Technology

2.3.1. Artificial potential energy field method

Hatiba put forward the method of artificial potential energy field. The main idea of artificial potential energy field method is to simulate the working environment of unmanned system as the environment of artificial potential energy field. The gravitational field and all repulsive opportunities become potential energy fields. The unmanned system is controlled under the action of potential energy field force. The following describes the specific design process of the traditional method of artificial potential energy field.

There are target points and obstacles in the two-dimensional space operation environment of unmanned system. It includes the position of unmanned system K, the position of target point s and the position of obstacle wa. The coordinates are [x, y], [xa, yb]. In the virtual potential energy field, when the distance between the unmanned system and the obstacle is small, the obstacle generally produces a large repulsive force to the unmanned system. When the distance between the unmanned system and the target is small, the target will have an impact. The smaller the gravity is, the potential energy function r of the gravitational field will be. Expressed as:

$$ R_s(w) = \frac{1}{3} k_r s^2 (w, w_a) \overline{d}(w, w_a) $$

(1)

Then the gravitational force F generated by the gravitational field. It can be expressed as:

$$ F_s(q) = k_r s(w, w_a) d(w, w_a) $$

(2)

Where s (W, WA) represents the distance between the unmanned vehicle and the target point, and D (W, WA) is a unit vector from the unmanned vehicle to the target point. K0 is a positive real number, indicating the gravitational coefficient.

2.3.2. Existing problems of artificial intelligence

So far, artificial intelligence has encountered many difficulties and major setbacks in the development process. Artificial intelligence has experienced a roller coaster development from the high-speed development at the beginning of its birth to the stagnation now. Root cause research can always be traced back to the fact that computers and people have different ways of thinking. Computational reasoning is deterministic thinking, which can not deal with uncertain problems. People can make uncertain arguments. Although computer analogy gives us a lot of knowledge to explore the psychological process of human brain, the working principle of human brain is fundamentally different from that of computer, because human brain can better deal with the problem of fuzzy concept, and the exact idea of computer can not solve some practical problems in life. Artificial intelligence has encountered major problems in solving practical problems. For example, in an air conditioning temperature control system, the control of air conditioning cannot be judged by conventional logic for fuzzy concepts such as appropriate temperature, lower temperature and slightly higher temperature. If you use classical logic to manage the air conditioner, it will always be on and
off, which will not only affect the service life of the air conditioner, but also bring a lot of inconvenience to its use. For another example, when the medical expert system diagnoses the patient's condition, due to the coordination of the reasoning base itself, the same patient diagnoses different diseases. There are many such examples, and there are many such phenomena in real life. Classical logic cannot solve such problems. This function can only be realized through a new logic. The main problems in developing artificial intelligence include:

(1) The knowledge required to solve the problem is incomplete and inaccurate. In reality, the knowledge needed to solve problems is often incomplete, imprecise and inconsistent with certainty. Incomplete knowledge means that when you have a problem to solve, you don't have all the knowledge you need to solve it.

(2) The description of the required knowledge is ambiguous. The fuzzy description of knowledge means that the boundary of knowledge is not clear. For example, the commonly used words "big", "relatively large", "not very big" and "not big" are not clear. Then, when the described knowledge is described by such a concept, it also becomes fuzzy knowledge.

(3) Many different reasons lead to the same conclusion. In the objective world, it is common to draw the same conclusion for many different reasons. For example, there are many causes of headache in humans. When seeing a doctor, the doctor can only make uncertain judgment according to the patient's symptoms, physical condition, medical history, duration and type of headache.

(4) The mode of solving the problem is not clear. Usually, there are many different solutions to real-world problems, and it is difficult to absolutely judge the advantages and disadvantages of these solutions. In these cases, people tend to choose alternatives that are subjectively considered relatively superior, which is also an uncertainty consideration. In human cognition, thinking and behavior, certainty can only be relative, while uncertainty is absolute. Artificial intelligence must solve these uncertain problems and use methods to express and demonstrate uncertain knowledge. At the same time, these uncertainties also bring many challenges to artificial intelligence.

3. Experiment

3.1. Safety Evaluation Method

At present, the existing safety assessment methods abroad are suitable for assessing artificial intelligence problems and assessing the severity of accident consequences.

(1) Qualitative safety assessment methods: expert assessment method, causal analysis diagram method, condition related risk analysis, safety inspection method, hazard research and operability, pre risk analysis, condition related risk assessment method, hypothesis analysis of failure safety checklist.

(2) Quantitative safety assessment methods: management error analysis and risk tree, probabilistic risk assessment method, Markov model analysis method, event tree analysis, error type analysis and impact, cause and result analysis method, probabilistic analysis method, fault tree analysis, logic tree and statistical diagram analysis.

3.2. Research Process of Artificial Intelligence Security Issues

Figure 1 is the flow chart of this paper's research on the security of artificial intelligence when multiple unmanned systems work together.
Theoretical analysis

Monitor and evaluation

Comprehensive assessment

Choose a mathematical analysis method

Select indicators of evaluation

Mathematical modeling

Safety evaluation system

Experimental analysis

Methods and suggestions

Figure 1. Artificial intelligence safety evaluation process

4. Discussion

4.1. Safety Performance Monitoring of Cooperative Work of Multiple Unmanned Systems

Table 1 is the test data of whether the artificial intelligence security performance solves the above problems when multiple unmanned systems work together according to a series of artificial intelligence security problems mentioned above.

| Number of tests | Precision | Scientific nature | Solution diversity |
|-----------------|-----------|-------------------|--------------------|
| 1               | 98%       | 98%               | 90%                |
| 2               | 95%       | 95%               | 98%                |
| 3               | 97%       | 94%               | 94%                |
| 4               | 96%       | 97%               | 96%                |
| 5               | 94%       | 97%               | 97%                |
| 6               | 92%       | 95%               | 95%                |
| 7               | 97%       | 98%               | 97%                |
| 8               | 94%       | 94%               | 89%                |
| 9               | 93%       | 98%               | 90%                |
| 10              | 91%       | 90%               | 94%                |
Figure 2. AI function tests

In this paper, three aspects of artificial intelligence function in multi unmanned system cooperation are tested, which are the accuracy, scientificity and diversity of artificial intelligence to deal with problems. As can be seen from Figure 2, when multiple unmanned systems work together, the accuracy of artificial intelligence in dealing with things can basically reach more than 90%. At the same time, it can be nearly 100% scientific, and various processing schemes can be budgeted. This shows that in the multi unmanned system cooperation, artificial intelligence can almost meet its needs, but it still needs to be further improved.

5. Conclusion
In today's era, artificial intelligence technology is more and more widely used. This paper mainly introduces the cooperative security in multi unmanned system. Firstly, it analyzes the current research status at home and abroad and some misunderstandings and defects existing in real life. Secondly, it describes and summarizes the possible dangers of intelligent robots in the working process. Finally, it puts forward corresponding solutions and conclusive suggestions for reference. The function is to make a difference when using artificial intelligence technology in the future, so as to make it more adapt to the development needs of society.

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