Application Research of Computer Communication Technology in the Development of Artificial Intelligence

Huiwen Huang

Guangdong University of Technology, Guangzhou 510000, China

877510916@qq.com

Abstract. With the advent of the 5G communication era, people's life and work are increasingly dependent on computer network information technology. The development and application of artificial intelligence (AI) technology has laid a solid foundation for the security of computer network. One technology plays an indispensable role in the development of this field, that is, computer communication Technology (CCT). Its core function is to support data, collect, analyze and process a large amount of information, and output scientific and reasonable calculation results. As one of the frontier directions, the application range of multi-agent system is more and more extensive. Compared with traditional software systems, multi-agent systems can provide more effective means to solve complex scientific and engineering problems. This paper focuses on the application of the trusted alliance technology of multi-agent system in the context of the Internet of Things, defines the parameters and conditions of some trusted alliances of the intelligent terminal of the Internet of Things, and preliminarily discusses the negotiation strategy of the process of strengthening the alliance. The organic integration of AI technology and computer network technology is a new direction of the intelligent development exploration and research of network technology. This paper studies and analyzes the application of AI in computer network technology in the age of big data.

Keywords: Electronic Communication; Artificial Intelligence; Development.

1. Introduction

In recent years, with the development of computer network technology and social progress, various complex network systems and corresponding resilience problems have become increasingly prominent. Using multi-agent systems to solve complex problems in the intelligent field has made many gratifying achievements, such as the research on multi-agent group behavior, multi-agent interaction, multi-agent alliances, multi-agent systems in intelligent transportation, aerospace, The application of automation system, automation and multi-agent technology in intelligent learning guidance system [1]. It is organically combined with big data, Internet of Things and other technologies, which to a large extent promotes business needs and business model innovation in various fields, and provides strong support for the intelligent development of the whole society [2]. Among them, the practical application of CCT and electronic information technology in the field of AI has gradually become the focus of attention of all sectors of society [3].

In recent years, the cooperation between the field of AI and other industries and fields has become an inevitable trend in the development of modern science and technology, and the combination with human production and life has become more scientific [4]. AI technology is included in both smart TV sets and machine expert systems. The continuous development and popularization of science and technology have enriched people's lives and effectively improved work efficiency [5]. The application of AI technology has opened up more new technical fields and is widely used in various industries, especially in computer network technology [6]. With its remarkable advantages, AI is widely used in computer network technology. Relevant researchers are further exploring AI technology and computer technology, and deeply studying the combination mode of AI and computer technology, so as to broaden the application scope and dimensions of computer technology and better provide reliable, stable and safe technical support for social development [7]. Therefore, the related research topics, such as QR code, Agent, wireless sensor, pervasive computing, cloud computing trusted upgrade, have also become the current hot issues. In view of the close relationship between the multi-agent system and the intelligent system of the Internet of Things, this topic chooses the

application of multi-agent system in the Internet of Things to carry out research, and deeply discusses the association model and specific application between the two, which is a new exploration direction of this topic.

2. Practical Application of Computer Communication Technology in the Field of Artificial Intelligence

2.1 Technical Realization of CCT in the Field of AI

The field of AI continues to carry out research on deep learning, and this technology can only be completed through the related construction of neural network. With the CCT, a large amount of collected information is marked first, and then the relevant data is analyzed and processed, and the learning about forward fitting and mathematical statistics is completed [8]. Specifically, it provides technical support for autonomous learning of AI technology through systematic annotation and collation of information data. In the application process of CCT, the marking of sample points by this technology can form a systematic fitting curve, so as to reflect the relationship between sample points and independent variables, and provide a standard for deep learning of AI [9]. In the dual-network structure of computer communication network, all network nodes are connected through dual networks. When a node needs to send messages to other nodes, it can send them through one of the dual networks. Under normal circumstances, dual networks can transmit data at the same time, and can also be used as the backup of computer communication network system in the way of primary and standby [10]. When one network is disconnected due to some reasons, another computer communication network can quickly replace the work of the error network, thus ensuring the reliable transmission of data, thus ensuring the overall reliability of the computer network on the physical hardware facilities of the computer communication network. With the rapid development of computer communication network technology and the growth of computer communication network throughput, distributed network services and exchanges are moved to the user level, thus forming a new hierarchical design model that is more suitable for modern large-scale high-speed networks. This hierarchical method is called "multi-layer design of network modules". In addition, the multi-layer network structure of computer communication network can also isolate network faults and support all commonly used network protocols. The multilayer network structure of the computer communication network includes three hierarchies. The multilayer network structure of the computer communication network is shown in Figure 1.
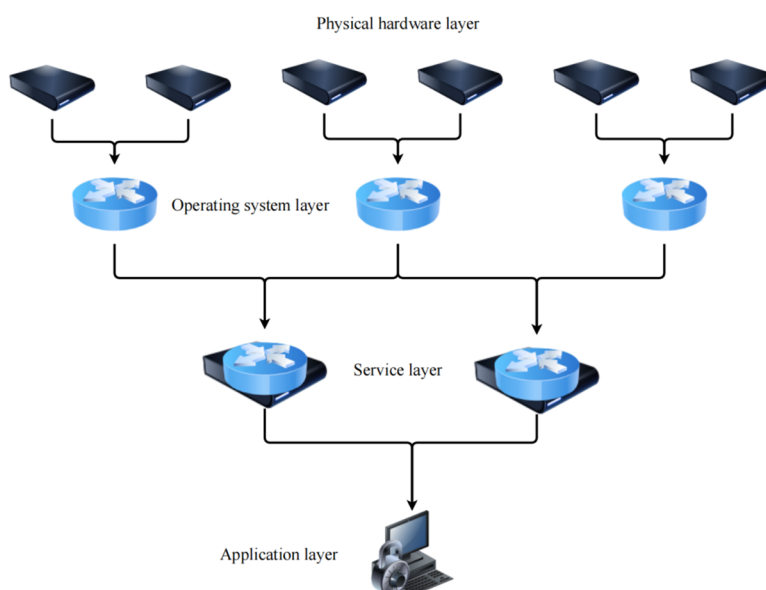

Figure 1. Architecture Diagram of Computer Communication Network

In the process of actual planning, design, construction and operation of computer communication network, attention should be paid to the following two aspects: First, scientific and reasonable selection of computer communication network management software should pay attention to whether its functions meet the requirements, at least the requirements of configuration, security and billing management. At the same time, it is required that computer communication network management software should provide a unified network management interface and follow the standard network management protocol. Secondly, in order to ensure the normal operation of the computer communication network, on the basis of formulating the necessary network management system and regulations, it is necessary to strengthen the training and education of computer communication network application personnel, and develop good application habits and professional ethics.

2.2 Multi-agent System

Agent is an entity that can perceive the external environment and has independent behavior, but each agent's own ability is limited after all. If we only study individual agents, we can't solve some complicated problems, but if we combine and ally agents, we can solve problems that individuals can't solve. Just like the human world composed of sending individuals, individual ability is limited, while the collective ability composed of humans and people is infinite, which can make many seemingly impossible things possible. The world emphasizes the spirit of cooperation between people and wants to form a collective. Multi-agent system has been a research hotspot in the field of distributed AI (DAI), but its research is not limited to the field of distributed AI, and it also has a certain relationship with logic, philosophy, ecology and economics. The interdisciplinary development trend is obvious, so that it can be widely used. If the activity objectives and resources occupied by individual agents are different, then when constructing a multi-agent system, these resources must be reasonably arranged to avoid conflicts. Through coordination, the interests of each agent can be guaranteed to the maximum extent, and the performance of the system can be optimized. For example, some agents may need to use the resources of other agents. How to use them specifically requires a coordination mechanism to ensure the normal operation of the system. Faced with the information provided by a large number of Internet of Things terminals, if all of them are connected to the Internet, massive data is indeed a big burden for the management services of the Internet of Things. All the information goes to the management service layer to screen and select the information useful for management, which obviously requires too much work. Therefore, if the information goes through the first round of screening and elimination before networking, and then goes to the management service, the burden of the management service layer can be greatly reduced. Then, the trusted access of the Internet of Things is particularly meaningful. The combination of computer technology and AI technology reduces the difficulty of users' operation. For users, the relevant data information of system building model is not necessary, and the core part is the deep learning mode of multilayer neural network. On this basis, users can realize high-speed data operation.

In recent years, with the upgrading of computer systems and equipment, the hardware support of CCT and AI technology has been improved, which lays a foundation for the innovation and optimization of algorithms and the improvement of data information processing efficiency. The practical application of distributed systems is relatively successful, among which the AI software Agent is one of the most classic cases. Agent technology is mainly carried out through a distributed system. Based on this system, a computing model of data information is built to realize data information exchange and communication in AI technology. In order to improve the user's data collection and processing efficiency, the distributed system of Agent technology can process a large amount of data information cooperatively, upload and distribute data information in a timely manner, make full use of the data computing capabilities of cloud computing, and provide a guarantee for the optimization of the Internet transmission environment.

3. Practical Application of Computer Communication Technology and Electronic Information Technology in the Field of Artificial Intelligence

3.1 Practical Application Cases of Computer Communication Technology in the Field of Artificial Intelligence

The improvement of social and economic development level and the improvement of social system have provided a guarantee for the development of modern science and technology. The integration of CCT with other fields and industries has become more in-depth, especially in business, medical, education, automatic driving and other aspects. From the various forms and characteristics of IoT terminals, the benefits of networking depend on the "effective" combination of terminals. In these terminals, the information provided by some terminals may be useless, and some terminals do not want the information to interact on the network; The information provided by some terminals may be critical to other terminals, and it is necessary to assign a networking priority to them, etc. So, how to ensure the "effective" networking of each terminal? We have introduced a lot of basic concepts about Agent. It is not difficult to see from them that the IoT terminal is very similar to the agent in the multi-agent system, and both of them seek to solve problems autonomously and pursue intelligence. Moreover, if the terminal can also have faith, desire, intention, etc. like Agent, sending can effectively solve the networking problem of IoT terminals. Because many characteristics and properties of intelligent terminals of the Internet of Things are very similar to those of agent systems, it is easy to get various forms of intelligent terminals of the Internet of Things through analogy analysis. Therefore, using the research results of Agent system for reference, the maximum benefit of the Internet of Things can be studied through the formation of multi-agent system alliances. Common network trusted access models are shown in Figure 2. AR is the access requester, PEP is the network access policy executor, and TDP is the trusted access decision maker.
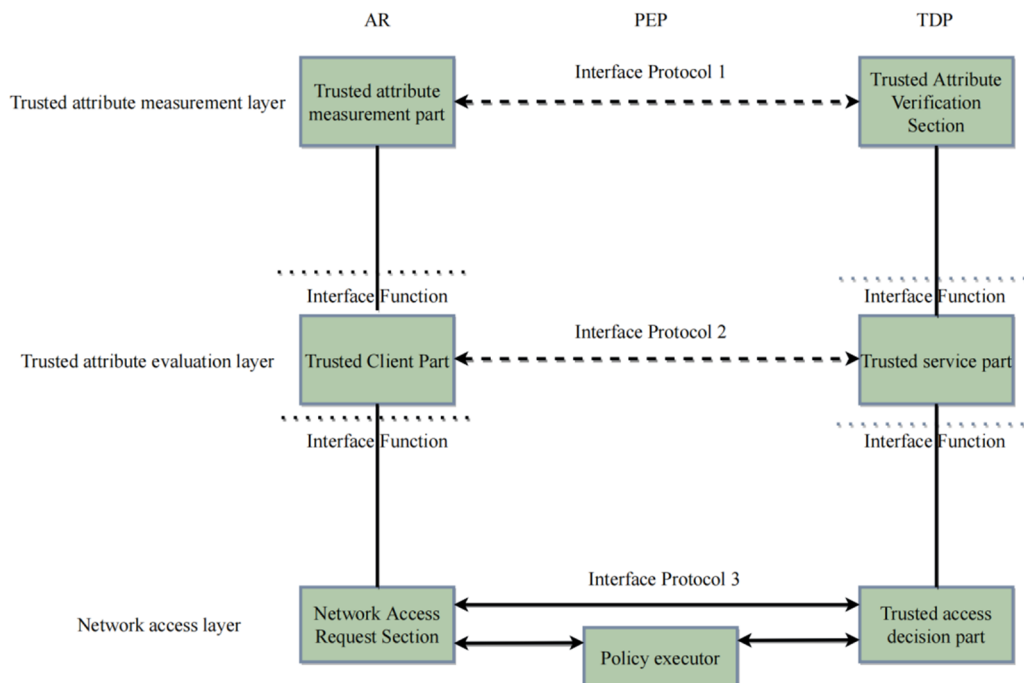

Figure 2. General Network Trusted Access Model

Trusted access to the Internet of Things will be more complicated than general trusted access to the Internet. The trusted access problem of Internet of Things is discussed and applied by the trusted alliance problem of multi-agent system. On this basis, the data information processing platform can effectively identify and classify the video content or picture content uploaded in the database, so as to realize the security and high efficiency of its.

3.2 Practical Application of Electronic Technology in AI Field

At present, the practice of electronic information technology mainly focuses on software programming, hardware automation control and so on. Usually, the intelligent sensor will be placed at the front of the vehicle to sense the road ahead in time. In addition to sensing, the intelligent sensor camera can also output the recognized image as video, and store it in Hadoop platform in NoSQL database. The platform will scientifically plan the algorithm mode that meets the user's needs in real time according to the acquired video scenes, so as to seek a matching solution. Then, it obtains the reputation evaluation value of each terminal from the reputation evaluation terminal, and then selects the appropriate management role terminal and assigns tasks according to its feedback reputation evaluation value.

When the management role terminal receives this request, it also obtains the reputation evaluation value of each execution role terminal from the reputation evaluation terminal, and then the management role terminal will root out the trusted value of each execution task role terminal, and select the appropriate execution terminal to execute the task of the leader. The executive role terminal can also further find allies and allocate sub tasks according to the assigned tasks. Another is how to reasonably divide a large task into sub tasks, so as to comprehensively solve large and complex problems through some problem fragments. Because some tasks can be parallel at the same time, and the completion of some tasks is sequential (for example, one task can be completed before another task can be executed), how to determine the problem-solving order is very important. This container instance introduces a role mechanism to assign each container management role, execution role, etc., and each role terminal solves practical problems through the alliance. Of course, the number of containers in the above example is small. In general, when the number of containers is large, the same method can be used for analysis, except that there are more terminals involved by various roles. From this example, we can see that the whole process of container terminal alliance is based on the principle of agent alliance, so the alliance problem of IoT terminals is similar to that of individual agents in multi-agent systems, that is, multi-agent technology can be applied to the trusted alliance of IoT terminals. Compared with the traditional mode, this technology can complete the information filtering in a very short time by using some simple instructions. On this basis, actively analyze the collected data to find useful information, which greatly reduces the user's search time and significantly improves the efficiency of information processing.

4. Conclusion

To sum up, CCT and electronic information technology have played a fundamental supporting role in the development of AI, and are also an important basis for the sustainable development of AI in the future. They provide technical support for the construction of multiple industries and fields, and are essential factors for achieving high-quality development of modern science and technology and social economy. Study the security domain model, especially compare and discuss the security domain hierarchy of Chang Jing lattice and the security domain hierarchy of extended lattice, and preliminarily discuss the multi-level protection mechanism of IoT terminals. On the basis of studying the commonness of multi-agent system and Internet of Things, the intelligent terminal alliance of Internet of Things system is discussed. At the same time, role mechanism is introduced to analyze the credibility of Internet of Things terminals, and an example shows that the credibility of alliance with basic role mechanism is much better than that of general alliance, which can guarantee the credibility of alliance. Of course, in the process of AI development, there are also some problems that should be optimized and adjusted in time, so as to promote the further development and reform of AI technology.

References

[1] Ullah Z, Al Turjman F, Mostar da L, et al. Application of Artificial Intelligence and Machine Learning in Smart City [J]. Computer Communication, 2020154:31-32.

[2] Li B, Hou B, Yu W, et al. Overview of the Application of Artificial Intelligence in Intelligent Manufacturing [J]. Frontier of Information Technology and Electronic Engineering, 2017, 18 (1): 86-96

[3] Tien J. M. Internet of Things, Real time Decision Making and Artificial Intelligence [J] Data Science Yearbook, 2017, 4 (2): 14-17.

[4] Guzman A L, Lewis S C. AI and communication: A Human–Machine Communication research agenda[J]. New Media & Society, 2020, 22(1): 70-86.

[5] Lu Y. AI: a survey on evolution, models, applications and future trends[J]. Journal of Management Analytics, 2019, 6(1): 11-29.

[6] Syam N, Sharma A. Waiting for a sales renaissance in the fourth industrial revolution: Machine learning and AI in sales research and practice[J]. Industrial marketing management, 2018, 69: 13-16.

[7] Pedro F, Subosa M, Rivas A, et al. AI in education: Challenges and opportunities for sustainable development [J]. 2019,62(10):3-6.

[8] Ghosh A, Chakraborty D, Law A. AI in Internet of things[J]. CAAI Transactions on Intelligence Technology, 2018, 3(4): 20-21.

[9] Singh S, Sharma P K, Yoon B, et al. Convergence of blockchain and AI in IoT network for the sustainable smart city[J]. Sustainable Cities and Society, 2020, 63: 10-23.

[10] Gill S S, Tuli S, Xu M, et al. Transformative effects of IoT, Blockchain and Artificial Intelligence on cloud computing: Evolution, vision, trends and open challenges[J]. Internet of Things, 2019, 8: 10-18.