Analysis on the Application Prospect of 5G Mobile Communication Technology in Internet of Things

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Abstract: With the rapid development of the Internet age, 4G technology is widely used, Nowadays, 5G technology has also made new breakthroughs, and 5G technology will inevitably become a new generation of communication technology. The Internet of Things is also bound to be based on 5G technology. The 5G IoT cloud will also be combined with cloud computing and big data technologies to make the entire society fully intelligent. This paper will briefly analyze the key technologies and development status of 5G, the architecture of IoT, international and domestic development status and future trends, and the integration of 5G and Internet of Things.

1. Introduction

Nowadays, with the continuous development of mobile communication technology and the rapid development of China's social economy, China has entered the era of network and informationization. Almost every decade, there will be a major revolutionary technology. Just as the 1G mobile communication technology can change the way people transmit information, 2G realizes the development of analog signals into digital signals. In the 3G era, mobile communication technology can not only simply transmit voice and data, but also effectively increase the rate of data transmission, which indicates that mobile communication technology and computer information technology have been separated. In the era of 4G communication technology, in addition to providing real-time voice communication, it can also provide additional services such as WIFI voice. 5G is a fifth-generation mobile communication network that has been gradually developed on the basis of 4G networks. Compared with 4G networks, there is a significant improvement in application speed, speed or stability, not only 100 times faster than 4G networks, but also the coverage area is a large area coverage, and each performance is far superior to the previous communication technology.

The Internet of Things can also be called a sensor network. Everything is connected, as long as a small chip is embedded in the object, it can connect different things in an orderly manner, thereby realizing the information interaction between human beings, objects and objects, and intelligent management. However, because the current wireless network still cannot fully support the development of the Internet of Things, the demand for mobile Internet large-flow applications and the demand for Internet of Everything are enormous. The development of 5G mobile communication technology has made the Internet of Everything a reality. The low latency, high speed and high reliability of 5G technology are driving the development of IoT technology at this stage and the future reform and innovation [1].

2. 5G Mobile Communication Technology

The 5G network, also known as the "fifth generation mobile network", is developed on the basis of 4G networks, and the transmission rate is a hundred times that of 4G networks. That is to say, within a few seconds, users can download a high-resolution movie. The concept of 5G technology has received attention and attention from all over the world. It transmits data at a speed of about 1G per second. Provide more convenience for the majority of users. It is estimated that 5G mobile communication technology will be applied around 2020, and studies have shown that by 2020, the

rate of 5G access network will be comparable to current fiber access, and its capacity will be at least 100 times. The increase, at the same time, the network latency will be very low.

As a leader in 5G mobile communication technology, the rapid development of 5G technology is closely related to China's innovation contribution. For example, China's Huawei company, through unremitting efforts, independent research and development, continuous innovation, will be the key technology of the leading 5G mobile communication technology into the international mainstream standards of 5G mobile communication technology. The Polar Code solution promoted by Huawei not only ended the monopoly of wireless technology in countries such as Europe and the United States, but also defeated the two major competitors such as LDPC, which is mainly promoted by the United States, and Turbo2.0, which was mainly promoted by France, and became the control of 5G mobile communication technology. The final encoding scheme for the channel e MBB scene. At the same time, this also marks that China's communications industry has achieved cross-era victories, and Chinese technology has become the core technology of communication standards.

3. Internet of Things

The Internet of Things is another wave of information industry after computers. the Internet and mobile communication networks. The Internet of Things is widely used in urban public safety, industrial safety production, environmental monitoring, intelligent transportation, smart home, health monitoring and other fields, allowing people to enjoy a more convenient, comfortable and safe life.

3.1 Iot Architecture

The architecture of the Internet of Things consists of the application layer, the network layer, and the awareness layer. The application layer mainly includes various applications, such as monitoring services, smart grid, industrial monitoring, green agriculture, smart home, environmental monitoring, and public safety. The network layer mainly realizes the transmission and communication of information. By accessing the information network and relying on various communication networks, reliable information interaction and sharing can be performed anytime and anywhere. The sensing layer mainly implements sensing functions, including information collection, capture and object recognition. Using RFID, QR code, sensors and other sensing, capturing, and measuring technologies to collect and acquire objects from anywhere, anytime; The core technologies of the Internet of Things include RFID-represented item identification technology, sensing and transmission technology, network and communication technology, data processing and storage, intelligent object technology represented by 3C fusion.

3.2 Internet of Things Status

Since 2009, countries have launched their own IoT-related development strategies. In the past 15 years, the United States has announced an investment of 160 million U.S. dollars to promote the construction of smart cities, and the construction of the IoT application experiment platform is the primary task. Japan established the IoT upgrade manufacturing model working group to track the scientific and technological information on the development trend of global manufacturing operations, and through the concerted efforts of the government and private enterprises to realize the transformation of the Internet of Things technology in Japan. The European Union officially established the Internet of Things as a strategic development plan for information and communication technology in Europe. In 2009, the European Commission officially issued a number of authoritative documents, focusing on the release of the EU Internet of Things Action Plan, and these are indicating Nowadays, the Internet of Things has become a global industrial wave. Most countries in the world have begun to invest a lot of money, energy, and developers to strive for the early realization of the Internet of Things era.

4. Fusion Application of 5G and Internet of Things

Through the development of 5G mobile communication technology, not only intelligent industry, intelligent agriculture, intelligent logistics, smart grid, smart home, etc. can be realized, but also wireless monitoring is everywhere, everywhere.

4.1 The Combination of 5G and Industrial Internet of Things

It can be seen that in the near future, 5G technology can effectively promote the rapid development of the Internet of Things, especially in the industrial Internet of Things, through the low-latency, high-speed 5G network can ensure that all mechanical equipment can achieve visual monitoring. The intelligent writing ability has also been continuously improved, so that the functions of each device can be maximized, and 5G technology can effectively reduce the power consumption of the machine and reduce the data delay.

4.2 The Combination of 5G and VR Virtual Reality Technology

The most important feature of VR virtual reality technology is that it is immersive. In the process of using VR virtual reality technology, it can collect and organize the personal visual, auditory and psychological data of the experiencer, and establish it through the supporting computer software the corresponding three-dimensional graphics. In this way, the experiencer can make himself appear to be in a virtual environment after wearing the corresponding head display device and data interaction gloves, and can also interact with the virtual environment through interactive gloves, and the experience can also pass The head-mounted device changes the scene as the action changes in the virtual environment, allowing the experiencer to be there.

However, due to the large data delay of VR devices, it is easy for the experiencer to have a dizzy feeling under the long-term use. However, under the current 5G technology trend, data transmission through 5G technology can not only achieve ultra-high resolution. The fast transmission of the rate video enables the experiencer to have a better experience, and can be distributed to multiple VR virtual reality technology helmets through the WIFI network, so that the experiencer truly feels "immersive". Through the use of 5G mobile communication technology, video resources can be simultaneously served, and network capacity [2] is improved. The high rate and low latency of 5G technology can effectively enhance the existing network broadband throughput, and also support a large number of data transmissions by different devices, thereby ensuring that users are completely unable to load during the Internet access process. process. Moreover, under the conditions of the Internet of Things, the streaming media recording device can be converted from a traditional mobile phone camera to a 360° panoramic camera through a 5G network.

4.3 The Combination of 5G and Cloud Computing

In modern life, due to the rise of the concept of Internet of Things, the idea of smart home has also emerged, and so far, smart home has made initial progress, just like the smart rice cooker, smart bathroom, smart kitchen, Smart security and so on are all good examples. For the realization of smart home, including information collection, perception recognition, speech recognition, image processing, etc., it needs the support of key technologies of Internet of Things such as big data and cloud computing. Nowadays, the advent of the 5G era has made the wide application of smart home possible. Through the integration of the Internet of Things and 5G technology, I believe that in the near future, the use of smart homes will no longer be a fantasy.

4.4 5G Mobile Communication Technology in Other Fields

Due to the application effect of 5G technology, the transmission rate of the entire network is more secure and reliable. The characteristics of these 5G mobile communication technologies are also very obvious in the application of highways, which can effectively alleviate the problem of vehicle crowding in dense cities. Some time ago, Huawei's use of 5G technology to remotely control the excavator to realize the operation made telemedicine no longer a dream. The low-latency 5G network can provide real-time feedback on medical diagnosis results. Smart energy can be used in

renewable energy. Supported by a low-latency communication network, it can provide smart energy suppliers with the network slicing required by intelligent distributed feeder systems, and conduct intelligent analysis to quickly and accurately determine grid system information [3].

5. Summary

The high speed, low latency and large capacity of 5G technology have laid a solid foundation for the development of the spurt of the Internet of Things. Through mobile communication technology, the world can be connected as a whole, and the "everything interconnection" can be realized quickly. The key to mobile communication technology lies in multiple access technology. Through multiple access technology, the number of connections and connection speed of devices can be effectively improved. The combination of 5G and IoT technology has great potential and great prospects. The integration of the two promotes smart life, the development of smart cities, and the future life of people will be greatly changed. Therefore, 5G technology Development can be called the beginning of the fourth industrial revolution.

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