

# Discussion on Short Distance Wireless Communication Technology and Its Integration Development

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**ABSTRACT.** Communication technology is constantly concerned by all sectors of the society, but also constantly facing more severe requirements and challenges. Short-range wireless communication technology is generated under the condition of continuous development of wireless communication technology, and slowly infiltrated into various industries and fields of the society, and achieved rapid development. As the technology of short distance wireless communication has its own characteristics and advantages, at present, it has become one of the hot topics. With the rapid development of China's social economy, the level of science and technology continues to improve, short-range wireless communication technology has also been widely used. Short distance wireless communication technology itself has great characteristics and advantages, so it has gradually become one of the topics of discussion and comparison in today's society. In this paper, combined with the real situation of short-range wireless communication technology so far, the general trend of short-range wireless communication and its integration development is briefly summarized, hoping to provide a more valuable reference for the future related theoretical research.

**KEYWORDS:** Short distance, Wireless communication technology, Integrated development

## 1. Introduction

The development of communication technology is not only concerned by the society, but also faced with more severe challenges and requirements. Short distance wireless technology is born under the condition of the continuous development of wireless communication technology, and gradually applied to all fields of society, and has made relatively rapid development. Because of its own characteristics and advantages, short-range wireless communication technology has become a more discussed topic. Therefore, it is necessary to study the short-range wireless communication technology.

## 2. Related Concepts of Short Distance Wireless Communication Technology

With the continuous development of economy and culture in our country, wireless communication technology must be further improved to meet the real life requirements of human beings in time, and most people's real requirements for wireless communication are mostly reflected in the transmission distance of wireless communication. Generally speaking, the technology of short-range wireless communication is mainly used for the wireless communication within 100m, which can be roughly divided into two situations: the first is high-speed short-range wireless communication, and the other is low-speed short-range wireless communication. These two different short-range wireless communication have their own advantages and characteristics, which should be based on the specific reality Situation analysis and application [1].

## 3. Analysis of the Development of Short Distance Wireless Communication Technology

As far as the current situation is concerned, the most common technology in the field of short-range wireless communication technology in China is the application technology of WiFi. The router used under this technology is formed through the development of 802.11ac technology. 802.22ac technology can give full play to its own characteristics such as fast propagation speed, high efficiency and strong reliability. USB technology is often used to transfer multimedia files to the outside because of its high efficiency. The transmission efficiency of Bluetooth technology is very low, but it does not affect the transmission effect, so most people use Bluetooth to transmit simple data and voice. ZigBee is also a new technology, although it has the disadvantage of low transmission rate, but it has been widely used in many control or induction occasions, which is a relatively reliable new technology type. RFID is mainly used in e-government, e-commerce and modern logistics.

Different types of short-range wireless communication technologies have many different characteristics and advantages. Therefore, the application fields of these technologies are also very different. The fusion methods of different short-range wireless communication technologies are basically reflected in several aspects, respectively:

### ***3.1 Continuous Integration of Bluetooth, USB and WLAN Technologies***

Generally speaking, the basic advantage of Bluetooth technology is its low power consumption, low cost and large capacity. It is very common in all industries of our society, such as identity recognition, image processing or installation of wireless devices. In addition, it should also be widely used in household appliances, medical services, fitness and other entertainment consumption. If Bluetooth technology, USB technology and WLAN technology are integrated, the hardware and communication products of these three technologies can communicate with each other more quickly and conveniently[2].

### ***3.2 The Fusion of WiFi Technology and 802.11ac Technology***

In fact, the WiFi we proposed has also experienced a long time. In the early stage, a new industrial standard for wireless communication was proposed at the end of the 19th century, which is mainly conducive to providing fast access to wireless local area networks. When this technology is put forward, it is mainly used in campus network and office building for office application and wireless access with user terminal. The advantages of WiFi technology are more obvious. For example, WiFi has a wide coverage, a block of transmission rate, a lower cost, and a stronger encryption capability. Therefore, this technology has gradually been widely used by the whole society[3].

### ***3.3 Irda Infrared Data Transmission***

This technology mainly uses the characteristics of infrared to complete point-to-point communication, but with the development of this transmission technology, the utilization rate of IrDA infrared data transmission is also declining, mainly in mobile phones, laptops and other personal office products. This technology has the characteristics of very simple application, small function loss, low cost and small volume, but there is a certain basis for its use. According to its characteristics of transmission and dependence on a certain angle between two devices, it is difficult to be widely used in the industrial field [4].

### ***3.4 ZigBee Wireless Communication Technology***

This technology is a new communication technology in recent years. Its main characteristics are low speed, simple operation and low cost. The general working frequency is 2.4 GHz. This wireless communication technology is recognized by most people in the industry. They all think that this technology will be used in the monitoring of home and industry [5].

### ***3.5 NFC Wireless Communication Technology***

NFC is short for short distance communication, which is a better application and service for a single device combination. It can memorize complex and lengthy passwords, and can also get benefits in ensuring data security. With the use of this technology, more and more devices can be connected to each other wirelessly [6].

## **4. The Trend of the Integration of Short Distance Wireless Communication Technology**

### ***4.1 The Integration Development of Bluetooth Technology and UWB Technology***

The emergence of WLAN technology brings unprecedented challenges to Bluetooth technology. Since the popularization of WLAN technology, the utilization rate and market share of Bluetooth technology and its related devices have declined significantly. It is undeniable that WLAN technology has great advantages over Bluetooth technology. Therefore, how to make up the gap between the two and give full play to the characteristics and advantages of Bluetooth technology has become the main research direction of Bluetooth

technology in the future. In the future, Bluetooth technology can be integrated with UWB Technology (ultra wideband wireless technology). When the two technologies are integrated, the way to use them can be improved effectively. From the perspective of Bluetooth technology, the integration with UWB technology can effectively improve the existing shortcomings of Bluetooth technology, such as transmission speed and power consumption. Once Bluetooth technology and UWB technology are integrated, the transmission speed of Bluetooth technology will be comparable to WLAN technology, and its power consumption will be far lower than that of electronic devices using WLAN technology. From the perspective of UWB technology, the cooperation with Bluetooth technology can effectively improve the market share of UWB technology, and achieve the popularization of UWB Technology in a short time. Once the two are integrated, it means that UWB technology can be applied to hundreds of millions of Bluetooth technology electronic devices around the world.

#### ***4.2 Competition and Development between WLAN Technology and UWB Technology***

In WLAN technology, there is a key technology called mesh technology. The application of mesh technology in WLAN technology has greatly improved the coverage of WLAN technology, and its importance is self-evident. With the gradual development of WLAN technology, its main development direction is not only focused on short-range wireless communication, but also the emergence of UWB technology undoubtedly brings new challenges to WLAN technology. Under this background, how to improve itself and strengthen the stability of short-range wireless communication has become the main development direction of WLAN technology in the future. At this stage, WLAN technology has basically met the network demand of computers and mobile smartphones, while the core frequency band used by most WLAN technologies in the early days is 2.4GHz. 2.4GHz frequency band has the advantages of small attenuation and long propagation distance, but its network environment is relatively complex, with large interference, and there are certain defects and deficiencies; however, 5GHz frequency band, which has emerged in recent years, has a wider signal bandwidth, a clean network environment, less interference, and a stable network, which can support higher network speed. Once 5GHz band is popularized in WLAN technology, the cooperation of the two bands will give full play to the advantages of WLAN technology. In addition, the application of MU-MIMO technology in WLAN technology can further improve the speed of network transmission.

### **5. Conclusion**

The economic and social development has brought the development of short-range wireless communication technology, and various short-range wireless communication technologies have been widely used in different social fields because of their own advantages and characteristics, making them play their role in the application and gradually expand their application fields. I believe that in the near future, short-range wireless communication technology will bring more convenience to people's life. The integration of various short-range wireless communication technologies is bound to improve the transmission speed, improve the transmission quality, and bring greater convenience to people's lives. Relevant researchers should increase the research and development of short-range wireless communication technology, so as to achieve the promotion of science and technology, and promote the progress and development of human society.

### **Acknowledgement**

2013 Science and Technology Project of Hubei Provincial Department of Education (B2013228) CO high sensitivity detection based on new adjustable long optical path multiple reflector.

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