

# Analysis on the application of "5G+AR/VR" technology in the field of communication

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**Abstract:** *The rapid development of 5G technology makes the information communication of our country more rapid and more extensive. AR/VR technology simultaneously provides more forms for the presentation of information content and the integration of 5G technology and AR/VR technology will also break the traditional video image and other news communication forms. This paper will analyze the possible changes and images in information dissemination by analyzing the advantages of the integration of 5G technology and AR/VR technology and make a brief analysis and prospect of future applications in news, culture, entertainment and other fields.*

**Keywords:** *5G technology; AR/VR technology; 5G+AR/VR; The field of communication; Immersive experience*

## 1. Introduction

As the most advanced mobile communication technology in China's civil field, 5G technology is the most popular and widely used fifth generation mobile communication technology in China's civil network with faster transmission speed, lower delay and lower cost. As early as November 2018, China's Chongqing established the first 5G continuous coverage experimental area. In the same year, China's AR/VR technology was unveiled together as a 5G application project. In June of the following year, China's Ministry of Industry and Information Technology issued its commercial license to China Broadcasting, Television, China Unicom, China Mobile and other departments, which marked that China's civil network field officially entered the 5G era.<sup>[1]</sup>

As the mainstream of China's mobile network at the present stage, 5G has broken many possibilities for people to use mobile terminals. For example, in the field of video, sound and other communication, short video, audio content and other forms of media products have been rapidly developed. As a new media technology, AR/VR technology, 5G technology also brings new development opportunities to it.

Since AR/VR technology was launched, it has been a hot topic of discussion in many scientific and technological fields. As a rising star of media communication, AR/VR technology has been applied in many fields. With the support of this 5G network technology, AR/VR technology has more immediacy in its image, sound, video and other aspects of communication, which makes AR/VR technology itself more immersive sense of reality, and strengthens its unique communication charm.

## 2. Analysis of the integration of "5G" technology and AR/VR technology

### 2.1. Combination of "5G+" technology and VR/AR technology

5G has accelerated the digitization process of Chinese society. Mobile social networking, mobile payment, online travel, e-reading, short video, etc., have gradually become users' daily habits along with the upgrade of mobile terminals. With the support of high bandwidth, large entertainment content (video, game, live broadcast, etc.) gradually exceeds the social field, and obtains more time for netizens. In the process of constantly updating and iterating many new technologies, the new terminal media of "5G+AR/VR" has also begun to enter people's field of vision. With the development and growth of new technologies, it has the characteristics of facilitation of carrying mobile terminals in terms of expression form and entertainment in terms of content. This kind of new communication carrier has a great impact on the traditional media carrier such as video, text and text. "5G+AR/VR" not only brings the impact of traffic, but more importantly, shakes the power of the media technology.<sup>[2]</sup>

As can be seen from the current application of 5G technology in China, the establishment of 5G

network needs to put forward corresponding requirements for the speed of base station use, which means that people can watch an ultra-high-definition TV through terminal equipment in a shorter time. At the same time, it can also carry out continuous optimization with the help of modern high and new technologies to realize the comprehensive improvement of 5G network technology. Under this premise, the traditional transmission technology restrictions will be changed for the broadcast and television industry, and the transformation of the entire transmission technology will be enhanced to ensure better viewing and feeling effects for users.

The addition of 5G network will make VR terminal devices more lightweight and effectively improve user experience. In order for VR to create virtual worlds, before 5G, it must first have a host with super computing power, which is expensive, and a high-resolution headset, which requires a cable connection. The new commonly used terminals developed under 5G network, "5G smart computer", "5G smart phone" and "5G smart TV", are equipped with high-performance cameras and powerful intelligent algorithms, supporting speeds up to thousands of megabits. These smart terminals, together with gigabit broadband networks and 5G communications, effectively solve these two challenges -- with the super performance and scalability of cloud computing, users no longer need to keep expensive "mainframe" at home. Gigabit broadband network and 5G communication, through the new generation of communication technology, directly wireless and VR headset data interaction, not only can cut the long cable, but also let VR applications can be expanded at any time, VR headset can truly become lightweight. <sup>[3]</sup>

## **2.2. Development and application of AR/VR technology**

AR technology and VR technology both belong to the virtual reality system, but there are differences in experience and technical presentation. AR technology, also known as mixed reality technology, is a kind of virtual world reconstruction on the basis of reality, which has a certain dependence on the real world environment. Therefore, in terms of technology, the application of AR technology has certain limitations compared with VR. VR technology is virtual reality technology, is the direct construction of virtual world, can directly create a world completely different from the reality through virtual technology, can be applied in a wider range of fields.

The most common application of virtual reality technology is video. VR video, also known as panoramic video, allows viewers to watch 360 degrees freely with strong interaction and provides immersive experience. However, the capacity demand of VR video is higher, which generally requires 4K capacity. Some video capacity needs clarity, even 8K, and the network speed is particularly important in this kind of video format with high frame rate. Therefore, in the rapid development process of 5G technology, the emergence of this kind of video format has a positive promoting effect. In the 5G era, information transmission features high speed, low delay and high reliability, and the transmission rate is a hundredfold higher than that of 4G. This change in communication technology has helped the spread of VR videos. <sup>[4]</sup>

The main creation content of virtual environment can be the restoration of the real world again, or it can be the imaginary world created subjectively. From the perspective of communication, VR has three core characteristics: one is immersion, which makes communication no longer a simple transmission of information from one point to another, no longer a viewpoint concept to spread among people, but a real sense of scene and experience to integrate into your physical feelings, which is an important extension of media experience as a human. The second is man-machine interaction, which is also the information exchange between people and the environment or the world; Third, innovation. AR, on the other hand, is more from the construction of reality to the return of reality, aiming to improve the "material world", and strive to improve the real things through the introduction of data layer, so as to deepen users' understanding of reality.

## **3. Development of 5G and VR/AR fusion application**

### **3.1. More powerful experience effect**

The integration of 5G network technology VR/AR technology will bring the new sensory experience of information transmission to a more real level, enabling people to have immersive experience. In this process, the support of computer technology is needed to synthesize a virtual world or virtual environment through computers, so that the audience can obtain different feelings and experiences. Usually, helmet or glasses are used as wearable devices to make VR technology fit the

news communication mode, so that the audience can feel the scene of news broadcasting even if they do not arrive at the scene of news, so that the audience can better understand the news communication and narrow the distance between the audience and the news.

The traditional way of news reporting is mainly to narrate and report in the form of words and pictures, which is transmitted to the audience by the skillful way of in-depth news processing of journalists, so as to achieve the relevant reports of news events. With the rapid development of the Internet technology era, the communication methods of news media are also changing constantly. News audiences are already familiar with traditional media methods, which lack of appeal to news audiences, and the audience will feel that the communication methods of news lack "freshness". Therefore, in order to break the traditional mode of news communication, the new mode of communication integrating VR technology and 5G network is an inescapable process of the development of news communication mode. VR technology enables the audience to enter the three-dimensional news world, so that all the senses of the audience can directly feel the news situation, and 5G network technology also provides the time-limited basis for the communication form that the audience needs to accept.

The integration of VR and 5G technology in the dissemination and reporting of news information can effectively eliminate the "whitewash" of news information by journalists and enable audiences to intuitively understand news events more accurately. Compared with traditional news reports, it breaks the limitations of text and pictures in the description of content. At the same time, it can enhance the audience's sense of participation in the reporting. It also enhances the interest and vividness of news information and improves the audience's attention to news information.

### ***3.2. Transformation of media center***

In traditional media, the communicator is the main body of the media. Basically, in the communication process, the audience will listen to the content released by the media communicator. However, in the era of the integration of 5G technology and AR/VR, this traditional mode of communication has been broken. Due to the emergence of AR/VR, the media's leading process of communication has changed a lot. In the whole leading process of communication, the audience will also participate in the leading process of communication, and the audience also plays a certain influence on the transmission of information.

In the communication of the whole media, the audience is an object to be considered emphatically. Many media workers always put the audience at the center of their work. The audience groups are often diverse, and the tastes and preferences of the audience are different due to the influence of their personalities, ages, cultural backgrounds and other factors. If you want to communicate content to get better feedback from the audience, it is necessary to set and plan relevant content according to the audience's hobbies and interest points. The integration of 5G and VR technology in the communication technology can enable the audience to obtain more real content and more novel forms of information. Some of them can improve the audience's feedback on information and realize the positive interaction between the communicator and the audience. <sup>[5]</sup>

### ***3.3. Changes in the traditional information communication mode brought by AR/VR***

Since the emergence of AR/VR technology, great changes have taken place in the process of information dissemination from the production of information to the audience's experience and acceptance. The transmission of information is no longer a simple text symbol, video, etc., but has evolved into "scene" and experience transmission AR/VR information transmission, information is not a simple symbol representation, but a highly restored scene of information. Especially in the field of news, the traditional news unitary mode has been broken. The communication of traditional news spreads words, pictures and videos to the recipients. With the integration of AR/VR technology and 5G technology, news communication is no longer simply describing and relaying news events or detailed information of news, but directly delivering the scene of news to the news audience, so that the audience can truly experience the feeling of the scene. Let the audience understand and feel the news events more directly and objectively.

In traditional news media communication activities, text communication forms mobilize people's visual senses, sound communication forms mobilize audience's auditory senses, and video communication activities mobilize people's audiovisual senses. Therefore, under the integration of 5G network and AR/VR technology, in the field of news information communication for the first time, not only in terms of listening senses, Even by immersing themselves in the news world through other

tactile senses, news information is perceived by many senses together, completely overturning the audience's understanding and cognition of news information transmission, which also means that news information transmission has entered a new era.

#### **4. Future application prospect of 4.5 G +VR/AR to communication**

##### ***4.1. The new pattern of AR/VR on cultural communication***

Our country has been committed to the development and protection of culture. The development of digital technology has enabled a lot of our traditional culture to be retained and displayed. Now, the development of AR/VR has provided a new channel for numerical cultural communication, and created more new foundation for cultural communication. Through the integration of AR/VR technology and 5G technology, cultural information can be transmitted to the audience by constructing virtual scene world, such as "virtual museum", "virtual classroom" and so on.

As a big country with a long history, China has a large number of cultural heritages that need to be preserved and transmitted through certain carriers. The rise of AR/VR technology provides unlimited possibilities for these cultural heritages in China. The use of VR technology makes the transmission of many cultural heritages have more high-precision, large-scale, interactive and widely received features. Especially in the popularization role of some museums, VR experience is combined with cultural collections of museums to make cultural popularization more digital and increase the interest of information recipients.

##### ***4.2. Application prospect of news communication combined with AR/VR technology and 5G technology***

Nowadays, the development of news communication technology has entered the digital era, or even the intelligent era. Under the 5G network, many new media have also become one of the important fronts of news and information communication. With the rapid development of new media, many audiences begin to participate in the communication of news and information, and audiences no longer only assume the role of news and information recipients. It begins to assume the role of re-creation or re-dissemination of news. The news communication mode after the integration of AR/VR technology and 5G technology enables the audience to feel more real sensory experience and meet the needs of the audience for news exploration. By this way, the news communication events can be truly restored and the news audience can receive the news more truly. Breaking the inherent limitations of traditional journalism.

##### ***4.3. Application prospect of 5G+AR/VR to entertainment***

The entertainment function of the Internet for people is an important reason for its rapid development, especially in the aspect of online games. The combination of 5G and AR/VR technology opens more channels for the development of online games, and the spread of game culture gradually enters people's vision. VR technology presents a real game world for people. More people can experience the authenticity of characters in the game world, and the culture covered in the game is spread among players through this form of game. With the arrival of 5G, GPU computing capacity, graphics rendering capacity, data transmission capacity and other technologies will be greatly improved, and devices suitable for AR/VR games will be more portable. It's fair to say that 5G will make AR/VR popular.

#### **5. Conclusions**

The maturity of 5G technology and the rapid development of AR/VR technology provide many possibilities in the field of communication. Whether it is for culture, news and information, or even entertainment, this new communication technology will form a storm of self-innovation for information communication. With the support of 5G technology, AR/VR technology will become one of the important means for people to disseminate information in the field of communication.

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### **References**

- [1] Dong Xingping. (2021). *Analysis on the path of media convergence in 5G era*. *China Newspaper Industry* (10), 100-101.
- [2] He Yuan, Wang Jin. (2021). *Application Practice and development direction of VR/AR technology in 5G era*. *Urban Party Newspaper Research* (04), 35-37+49.
- [3] Xu Xiang, Wang Li, Weng Jin. (2018). *AR/VR technology and the information transmission model reconstruction*. *Wide Angle* (19), 65-67.
- [4] Lin Chaoyu. (2020). *VR Technology and the Communication Effect of Knowledge News*. *China Media Science and Technology* (12), 50-55+66.
- [5] Yang Bohan. (2018). *The application of VR technology in the field of News Communication*. *Science and Technology Communication* (13), 95-96.