

Application analysis and development forecast of 5G in media field

Sitan Shen

Tongji University Department of Microelectronics Science and Engineering, Shanghai, 201804, China

Abstract. The arrival of 5G era has brought many changes in the media field. Visually, the maturity of ultra-high-definition video and VR technology brings a more real perception; In terms of engagement, real-time interaction makes people more engaged and reduces the demands on the user's hardware; In the form of expression, "short video +" will become a direction of contemporary media integration. In addition to these opportunities, the arrival of 5G also comes with risks, and efforts should be made to prevent problems.

Keywords: Media field; 5G+ media; Short video; Artificial intelligence; VR/AR technology.

1. Introduction

With the arrival of 5G era, more and more "5G+" appears in people's vision. Autonomous driving, AI technology, VR technology and the Internet of Things are some of the areas that will benefit the most. This is mainly due to the significant improvement of 5G in an all-round way compared with the previous generation of 4G. Features such as ultra-high speed, ultra-low delay and super-large network capacity have brought new possibilities to these previously difficult targets. With the continuous expansion of 5G commercial scale, the media field will also face a new round of deconstruction and reconstruction. Firstly, the application of 5G will reconstruct the communication mode and working performance of media products. Second, 5G accelerates the process of industrial integration and reshapes the market pattern and industrial ecology of the media industry. Finally, 5G will promote the media industry in the process of commercial application landing, so that the media field will enter a new stage of international competition and development.

2. The impact of 5G on product form presentation

2.1 Ultra HD transmission

It is generally believed that what 4G has changed is people's lives. It has contributed to the rise of mobile social networking and live broadcasting, and truly realized the requirement of high-speed service. In the 5G era, stronger network capacity and the potential of the Internet of everything will bring about revolutionary changes in the presentation of media products once again. One of the most intuitive is the multiplication of video resolution. With the continuous improvement of people's demand for picture quality, the resolution of video content has been developed from 4K to 8K or even just proposed 16K. The transmission rate of traditional 4G network is completely unable to realize the transmission of this huge data. The downstream peak data rate of 5G reaches 20Gbit/s and the upstream peak data rate reaches 10Gbit/s, which reduces the theoretical network delay to millisecond level, fully satisfying users' demand for high picture quality, and enabling people to enjoy more realistic and realistic picture content more smoothly and quickly. Not only ultra high-definition video, but also technologies such as live streaming, video conferencing and remote real-time monitoring, as well as cloud games and remote consultation, are all promising development directions.[1]

2.2 The application of AR and VR immersion technology

AR and VR technologies have been proposed for many years, but they are still not popular among the general population. One of the main reasons is the discomfort caused by long delays caused by

slow Internet speeds. After the large-scale application of 5G, this problem will be solved. First, the multi-access edge computing technology of 5G can significantly shorten the time of rendering and make cloud rendering resources unnecessary to be reused, thus greatly reducing the cost. Second, 5G has network slicing technology, which can fully guarantee users' experience of cloud VR. Third, mobile VR scenes such as aerial live shooting need ultra-fast network support, and 5G can meet their requirements. The emergence of "5G+VR" enables the development of education, medical treatment, game entertainment and even real estate to have further possibilities, and lowers the threshold of VR industry to get closer to ordinary people's lives. If 5G becomes more mature, there may also be naked eye VR in the future, and scenes that can only be seen in science fiction movies may actually become reality in the future. In the process of the development of integrated media, the picture content will become more three-dimensional and diversified, and the sense of immersion and substitution of users will continue to be enhanced.[2]

3. 5G breakthroughs the depth and breadth of information transmission

In the 4G era, the interaction of information transmission is limited. People can usually only watch movies downloaded in advance. Even if they watch movies online, they just cache the following content on the device in advance, and cannot realize real-time interaction. For example, interactive movie games such as Detroit Turns have a larger capacity than the average movie, because different options lead to different plot directions and thus different endings, each of which needs to be downloaded in advance. But in the 5G era, real-time interaction is possible. The film Pendasniki represents the rise of real-time interactive cinema. This is an amazing development, because it allows people to be as involved in the movie as possible, to be the protagonist of the movie, to decide where the movie is going, and crucially not to take up a lot of space on the device to pre-download the story, but to update it in real time and decide what to do next.[3]

The breadth aspect is the latest hot concept, advances in the Internet of Things. The scene of 5G era is made up of five major systems: mobile devices, social media, big data, sensors and positioning systems. "The Internet of everything" has always been a direction of life science research. However, the 4G transmission rate is not enough to support real-time interaction of smart home, so it has been in a tepid situation. In 5G, the interaction between people and things and even things with things has finally become a reality, and human's personalized requirements can be further satisfied and more appropriate solutions. Smart objects can give you customized help that works best for you, based on the weather outside, as well as your personal lifestyle based on big data. At the end of the Internet of everything, we will face a new media environment in which the interaction of human, machine and nature is completely integrated, which is a reconstruction of the whole environment centering on digitalization. [4]

4. The new "landing" form of 5G in the media field

4.1 The popularity of short video and the process of media convergence

In this context, the continuous breakthrough evolution and "landing" application process of 5G, Internet of Things, artificial intelligence and other advanced technologies has increasingly become an important carrier for the in-depth development of various media integration. "Short video +" is a new term that has emerged recently. Similar to "5G+", it also represents the integration of short video and other media methods. It is one of the important driving forces for the deepening development of media integration today, while creating the possibility of innovation and change in many fields. Such as "short video + e-commerce", in Bilibili and other platforms have a variety of commercial ways to promote themselves, borrow well-known UP main video implant advertising is one of the most common way, the effect is also much better than before simply put on the network advertising. Not only e-commerce, but also many traditional mainstream media are joining short video platforms, which is the most obvious sign that the form of media is changing. In today's fast-paced life, short

video is the most convenient way for people to quickly understand what happens in the day. Therefore, mainstream media have transformed from traditional media, entered the field of short video one after another, tried to change the media communication mode, appeared in the way people like, and assumed the responsibility of positive guidance of network public opinion by means of short video. The arrival of 5G also broadens the way short videos are made. As AI, the Internet of Things, VR and other technologies continue to mature, the form and content of short videos will become more diverse. Video clarity, delay, interactive strength and other aspects will be significantly improved, the definition between the real and virtual will become more and more blurred, giving the audience a more real experience.[5]

4.2 Further application of artificial intelligence in media

Artificial intelligence has always been a hot topic in the society, and the amazing performance of Alpha Dog in the past few years also shows us the endless potential of future development in this field. However, to truly use AI in our lives, we have to overcome the time loss of analyzing massive amounts of data. The free choice of massive information does not meet the growing demand of the user market, but the explosion of information also increases the difficulty of screening users. Therefore, 4G cannot be used before, but to 5G, artificial intelligence can make network operation more convenient and fast, make big data and artificial intelligence more closely, bring further changes to the society. As early as 2018, Huawei released its future AI strategy, with site-wide AI solutions becoming the core of "Everything intelligence". In the aspect of AI+ video, nearly half of the current AI industry applications are based on video. The reform of short video also accelerates the landing of AI in the industry. In terms of AI+5G, the large bandwidth and low delay provided by 5G will bring AI's computing power to a higher level. [6][7]

5. Supply of chips -- upstream microelectronics chip industry

The impact of 5G in the media field is ultimately the change in the application of 5G, which belongs to the downstream of the industrial chain. In order to realize all these changes, 5G chip technology must be supported, so the field of microelectronics belongs to its upstream industry. In the 4G era, chips are mostly concentrated in the manufacturing of mobile phone chips. However, "5G chips are the standard feature of the Internet of Things era," which will be useful in driverless driving, smart everything, shopping, healthcare and more. Huawei has always been in a leading position on the road of 5G. As early as 2019, it launched the global 5G multi-mode terminal chip "Balong 5000", which was a world-leading 5G terminal baseband chip, representing that Huawei has successfully mastered the advanced technology and overcome the difficult problem that Apple, Qualcomm and other companies had not completed at that time. In addition to the above chips, Tiangang Chip, as the world's first core chip of 5G base station at that time, was also unveiled at the conference in nineteen nineteen, highlighting Huawei's "end-to-end" perfection, achieving full coverage from terminals to networks and cloud data centers. Behind Huawei's amazing success lies a very difficult research and development experience. From 4G chips to 5G chips, it may seem like a single number change, but the difference in technical difficulty is enormous. 4G to 5G requires a change in the entire ecosystem, from terminal devices to base stations. 5G chips are no longer just in mobile phones. Smart homes and small base stations all need different kinds of chips to support them. The massive data brought by big data and the further integration brought by the compression of chip size are all issues that cannot be ignored on the road of 5G chip research and development. The difficulty of incorporating millimeter waves into 5G chips has also puzzled many experts, with increasing integration density and heating problems associated with increased power making the chips exponentially more difficult.

Although Huawei has a lot of outstanding performance in 5G, there is still a big gap in the field of 5G chips at home and abroad, especially in the field of high-end 5G chips. Although Huawei has developed many 5G chips, and even independently developed the 5nm Kirin 9000, the production of

chips requires authorization from ARM and contract manufacturing by Taiwan Semiconductor Manufacturing Company. The United States has chosen to choke Huawei in these areas, and Huawei does not have a good way to counter it. Now Huawei is struggling in high-end chips. Huawei is so, other domestic enterprises are more difficult to form a climate. Therefore, the autonomous manufacturing of chips is a big focus of current development, which is the cornerstone of all buildings before they are built. With them, Chinese enterprises can truly go global. [8]

6. Risks arising from changes in the media sector

Opportunities and challenges always coexist, the same is true in the media field.

First, the shape of the product will change, and immersive interactive video will become the norm. At that time, everyone can experience the benefits brought by virtual reality, but harmful information can also be transmitted through virtual reality technology, which is more likely to pollute people's minds and bring bad effects on the social atmosphere.

Secondly, the values and ideologies brought by the Internet are very different from the traditional ones. Many young people do not know much about the mainstream ideology, but form a unique set of Internet ideology through the pan-entertainment of network videos. Once the unhealthy atmosphere of the Internet appears, these young people are easy to be affected and thus degenerate.

Finally, the deluge of data makes it harder to review video and other information. Once there are omissions in the review process, allowing harmful ideas to spread into society, the consequences can be extremely serious.[9]

7. Conclusion

This paper discusses the application analysis and development forecast of 5G in the media field. From the perspective of expression content, the breakthrough of ultra-high definition video and VR/AR has changed people's visual experience, while the emergence of real-time interactive movies has changed people's sense of participation in them. From the form of expression, all kinds of media under the influence of 5G will tend to converge and shift to new forms of expression such as short videos. With the further popularization of new technologies such as 5G, Internet of Things, artificial intelligence and blockchain, short videos will have more connections with other industries and accelerate the pace of deep media integration. There is still a long way to go in the development of 5G chips, and the risks brought by changes in the media sector should not be underestimated.

Reference

- [1] Yin Xuefeng, Yan Huo, et al .Introduction to 5G Communications [M]. Huazhong University of Science and Technology Press, 2020:
- [2] Chen Guanghui .5G and media convergence[J]. Media : :MEDIA, 2020, 4:18-20.
- [3] Yuanfang, Luo Tianyu, Liu Huaqing, Wang Cuifang, et al . An introduction to interactive experience in virtual world from AR game[J]. Light Industry Science and Technology, 2020, 1: 69.
- [4] Liu Shan, Huang Shengmin . Deconstruction and Reconstruction of China's Media Industry in the 5G Era[J]. Modern Communication, 2020, 286(5):1-6.
- [5] CAO SAN SHENG, HU QIANQIAN.Analysis of the development situation of short video in the context of 5G and media convergence[J]. Media : :MEDIA,2020,6:19-22.
- [6] LIAO Jun, LIU Yongsheng, WU Haoran, LIU Tengfei.5G+AI empowers industrial change[J]. Communication World,2019,17:43.
- [7] Li Min, Su Shimei. Reflections on the construction path of integrated media in 5G era[J]. Young Reporter,2020,5:41-43.
- [8] Qiu Wenfeng. Application of Huawei 5G and Domestic Chips in Emergency Command System[J]. Electronic World: 124-125.

- [9] WU Tao, ZHANG Zhi-An. Media changes and opportunities for mainstream media under the influence of 5G[J]. Modern Electronic Technology, Media::MEDIA, 2020, 10:31-33.