A Study on the Potential of Utilizing Sensible Media for Dance in 5G Network

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Abstract

A 5G is 20 times faster than 4G. It also has hyper-connectivity, low latency merit and boundless potentials for medical education, transportation, entertainment and so on. In accordance with this, it is time to quickly look over on the utilization plan for 5G and sensible media in dance field, deal with the issue and its utilization. First of all, this study will review potential of 5G and sensible media in dance and its development plan. It seems like dance is able to communicate in a three-dimensional way. Utilizing sensible media can contribute to inform people of dance, and increase fun and interest which will make three-dimensional mutual communication. Also, in 5G environment, one can select whatever one wants in his or her viewpoint when utilizing sensible media such as VR, AR, hologram and so on. Supposing in a case of dancers and judges, it is possible for them to hire their own style of dancers in their countries. So, both the dancer and the judges have the positive merits. Third, streaming is possible without any installation, buffering is reduced. At the same time high-definition of media is allowed. This allowed collaborated performance of celebrities in dance and it also increased concentration and engagement. Dance field should acknowledge 5G sensible media, look for systemic and detailed method and disseminate and spread professional training and performance. In dance, testing fast developing sensible media due to 5G network, produce systemic dance training environment with various try is required and an effort for the performance situations in which advanced 5G sensible media is used.

Keywords: *Dance, Sensible Media, Tangible Media, Potential of Dance, 5G, ARVR*

1. Introduction

According to International Telecommunication Union(ITU), maximum and minimum downloading speed is 20Gbps and 100Mbps, respectively. The speed improvement of 5G is predicted to interact positively with VR(Virtual Reality), AR(Augment Reality), MR(Mixed Reality), and holograms. Chairman of Chinese company, Huawei. predicted that the number of subscribers would reach 2.8 billion by the year 2025, with 6.5 million 5G operating utility, and that the spread of AR and VR will accelerate.[1]The performances industry is in the process of quickly accepting communication technologies and immersive media services. Among the international performance industries, LA Philharmonic produced the VR performance services with graphic animation in 2015, and the New Zealand Symphony recorded the 360-degree all-round sound, making it possible for the audience to feel as though they were in the middle of the actual orchestra.[2] In the case of dance industries, a famous British contemporary dancer, Wayne MacGregor, created the 'Atomos' combining digital technology and dance.[3]When it comes to Korean dance industry, Lee Jeonghee and

Yang Seungmoo(2016)[4]have experimented with VR in tightrope. However, they reported that there is a limit to convey immersion due to frequent buffering, though it is interesting to try. Nonetheless, an Korean artist Yeon Dong Kyun, who is called VR artist, is continuing to interact with VR technology in anticipation of the development of complementary relationship between VR and performance. 5G is 20 times faster than 4G and has advantages of super connect, low latency, super fast. With these advantages, 5G is improving abovementioned limitations and opening up unlimited possibilities. For the first case in world history, in 2019, KT(Korean Telecommunication) presented hologram using a 5G network at K-Live, despite a distance of about 9,500 km between Korea and Los Angeles.[5] In the "World's First Commemorative Concert," to show the changes that 5G will bring, a interactive performances were demonstrated in Busan, Gwang-ju and Seoul. In this demonstration, the finest expression were delivered to the audience with which we can predict the development of immersive media based on 5G.[6] In this way, 5G's superiority makes it possible to predict infinite possibilities such as education, medical, transportation, and entertainment. It is time to look at 5G and immersive media utilization in the dance world quickly and cope with it. This study examines the potential of immersive media using 5G network and how we can incorporate these study into the dance industry's development plan.

2. The potential of 5G immersive media in dance industry

2.1 Immersive media in 5G network

2.1.1 Immersive media

Immersive Media(Tangible media), which is also called realistic content, is a promising field. It is a next generation content that provides a realistic and vivid experiences of the five senses of sight, hearing, smell, taste.VR(Virtual Reality), AR(Augmented Reality), and MR(Mixed Reality) can be included in the immersive media.

2.1.2 VR(Virtual Reality)

VR is the realization of a complete virtual world in which human beings are able to compete with the perfect real world through computers, just as a special situation or a real environment interacts. This is called virtual reality or virtual environment.[7] Familiar virtual reality is immersive and there is a virtual reality that the third party can sees. In order to realize the virtual reality, it is necessary to have a three-dimensional space that does not actually exist but appears to be actually in existence. Plus, we need an output device that controls the human vision as if the user is in the space. It also requires real-time interaction with real-time response through immediate input and processing. Through VR, it is possible to do psychological education and training, games and so on.

2.1.3 AR(Augmented Reality)

AR is an augmented reality in which the real world takes up more weight than virtual reality. This technology is a technique of displaying a three-dimensional virtual image as a single image by superimposing on a real image.

AR has potential possibility due to improved function of 5G. Augmented reality is divided into object recognition method and location based method. The augmented reality can be used not only as navigation but also as an educational content that can present specific explanations when a menu of a restaurant is taken with a mobile phone. It can be predicted that if the technology is applied to the tourism industry, it will make an endless development.

2.1.3 MR(Mixed Reality)

MR is a hybrid reality capable of recognition of 3D objects and environmental awareness. It also able to interact with human beings and utilize high-quality hologram. Compared with AR, MR has a high proportion of virtuality. Also, virtual and real parallel. MR is still in an immature stage but its ultimate aim is to express the virtual and the actual in a space through MR.[8]Through mixed reality, it is possible for people from all over the world to meet and talk at the same time. MR can be used in all areas where AR and VR technology are used.

2. 2 The potential of 5G realistic media in dance industry

It is expected that the possibility of use of killer contents will be activated in various fields such as medical care, education, and entertainment with improved quality of immersive media due to the appearance of 5G. The author of this research divided the possibility of using immersive media in the field of dance as follows. First, in 5G network, three-dimensional communication is possible. In the 2000s, interest in adult ballet has increased as the keywords of healing and well-being have attracted attention.[9] In addition, people began to expose their changes through various media such as Youtube and SNS. Some adults, however, are passive in expressing themselves. Utilizing the 5G network, it became possible for ordinary adults to expose themselves through avatars which can represent their real face or body. This shows that the owners of characters who do not like to reveal themselves are able to communicate using avatars instead of their own.

Attracting attention in body movements have also become possible. This is because the deep-running technology, which is a technique of synthesizing the face of the one's face to the body of the expert, can be conveniently used.[10]Even so far, deep-learning technology had a limitation because of the frequent buffering caused by a late transmitting speed. Therefore, it was more like a robotic movement than it seemed to be human's movement or dancing. Therefore it was not activated until now. However, since contents are transmitted accurately and quickly by utilizing 5G, it became possible to replace the face of the an expert with the one of a not-expert and to make it look like the not-expert is actually dancing. In addition, since it is possible to see the virtual reality with a 360-degree screen, it becomes possible for non-experts to participate in the performance as it is. The use of such media can attract public attention and promote dance. In addition, it can stimulate the development of dance in various forms through mutual three-dimensional communication by amplifying fun and interest.

Secondly, using 5G environment, I can see and experience what I want to see from the point of view that I want to use real media such as VR, AR, hologram. The body of the dancer is an important material of the performance, and the dancer's body shape and style of dance have a great influence on the performance. That's why directors have been auditioning and hiring dancers only in their country. With the technology of telepresence, which is a compound word of "tele" which means a long distance and presence, which means a presence, has become possible, it has now possible to talk with the other party in a real size screen. In addition, recently, a 5G network together with hologram and telegram technology has become possible. In the field of dance, using these immersive media in the 5G environment, it became possible for interviewer to accurately identify and recruit dancers at 360 degrees in their own countries. Also, because dancers can see and experience the stage in other countries in virtual reality, it seems possible to present a complete performance. It will also facilitate direct and realistic exchanges of views and opinions. The advantage of this is that it can reduce the burden on the dancers economically and provide a high-quality performance for the audience. As such, choreographers and directors can see their dancers in a 360-degree perspective as if they were a real dancer in their own country. Also, because they can have dancers who can present a perfect performance, it is possible to prevent economic loss.

Third, there is no need to store or install the content of immersive media in the 5G environment. Streaming the content is also possible immediately. In addition, buffering is reduced in the 5G environment and high-quality images can be viewed at the same time. This advantage enables collaboration in

performances. Hologram has already revived late singer Kim Kwangseok, Shin Haecheol and Yoo Jaeha. In abroad, late singer Tupac and Michael Jackson performed on stage overseas using the hologram technology. As of 2019, the 5G network will enable high definition video and fast streaming to enable collaboration with existing artists, past artists or current artists. In the case of dance, it means that you can perform on stage with artists from past history such as Anna Pavlova and Isadora Duncan. Collaboration with these great people will make it possible to create more interest and fun for dance. Also, participation in performances with people I like will increase concentration and immersion, and if we improve people's motivation in this way, there is a possibility that the culture of dance and performance will be abundant.

3. Proposal for development plan of 5G realistic media in dance

In addition to the emergence of the term "Art-Technology, which is a compound word of art and technology, interest in immersive media such as VR, AR, MR, and hologram has increased. Despite the commercialization of 5G, however, the dance industry does not realize the changing environment. Immersive media is expected to rapidly expand its territory from dance performance to dance performance and dance education. Therefore, we must recognize the following parts.

First, due to the network of 5G, it should be recognized that dance major students need a combination education methods using immersive media and dance. In future dance education, dancers will want more professional and high level education. In addition, the general public, who became familiar with dance through TV or media, will want a systematic lesson with fun and interest. Dance education in the classical way is now became an isolated and closed way, and can be an obstacle for the future dance education to make a new improvement. 4G, which appeared in 2011, not only did not have an through nationwide network, but also had a lot of complaints from consumers because of the high price. The same complaint seems to be in place for 5G in 2019. Nonetheless, the dance industry should examine the use of new education methods and immersive media in various ways. Mutual exchange is indispensable for world performance and education. Therefore, dancers must be aware of the necessity of multi-media education. Second, in 5G environment, the education of immersive media about dance should be systematically divided.

Science is no longer dedicated only to scientists and dance is not something only dedicated to dance. Dancers should learn science and scientists should learn dance. And by exchanging ideas with each other, they shall find possibility of development of both sides. In the 5G environment, it became possible to perform the VR collaboration performance without errors. In addition, through the AR, education can be received from famous foreign dance educators. Also, education and quality performances using 3D projection mapping, 3D hologram, and artificial intelligence have become possible. However, there is no education about immersive media ongoing. In the 5G environment, detailed dance education using immersive media can not only create new jobs for the 4th industry, but also can spread the performance culture category.

Finally, the dance industry should disseminate and spread specialized education and performances along with immersive media. The commercialization of 5G will enable dancers and the general public to easily access immersive media such as VR and AR. The ease of access means that mutual exchange is happening fast. In 2019, with 5G, telecommunication operators are focusing on developing and spreading immersive media content created together with popular boy or girl groups. According to the people who have experienced these immersive media, it is said that they feel like they are actually sideways dancing with a popular girl group.[11]There are dance stars such as Kang Soojin and Seo Hee in the in the dance industry as well. The same contents can be used and distributed to dance education and performances. If diversified immersive media is used and distributed, the dancers can secure wide attention and they can attract interest and response to performances.

4. Conclusion

5G still has several limitations in its use. However, 5G has the great potential to make possible what we have not been possible before, and it will become a container for everything beyond virtual reality. 5G, which has recently been launched, does not have sufficient stations, so the network is not spreading, and there is a technical lack of immersive media. At the beginning, 5G commercialization will emphasize virtual reality, but as time goes by, a lot of contents and platforms will be merged and a new era will be expected. Dance industry need to prepare for it. Although it lacks expertise and accuracy, we need to experiment with immersive media that evolves rapidly based on the 5G network, to make various attempts, and to provide a systematic dance education environment. It is also necessary to make efforts to approach the performances using advanced realistic media progressively.

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