

# Application Value and Prospect of Virtual Reality Technology in Display Space Design

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**Abstract.** In the information age, the continuous update of science and technology has brought the rapid development of virtual reality technology, and it has been applied in many industries. At the same time, a large number of information communication needs also put forward more requirements on contemporary exhibition space design. Virtual reality technology can break the limitations of space and time in previous exhibition space design, strengthen the interaction between the audience and the exhibition information, and make them understand the exhibition more quickly. This paper aims to discuss the application value of virtual reality technology in contemporary exhibition space design and the future application prospect in exhibition space through the analysis and summary of the current relevant literature and actual development of virtual reality, and finally profoundly understand the possibility and importance of this technology in exhibition space design.

**Keywords:** Virtual reality; Display space; User experience; interactive.

## 1. Introduction

With the continuous development of science and technology, virtual reality technology has been widely applied in people's lives. Interactive immersive experience with great authenticity has brought a lot of user feedback. At the same time, the information society also continuously promotes the innovation and development of contemporary exhibition space design, from the entity to the virtual, from the two-dimensional plane to the multi-sense space, from the finite to the infinite. These changes are gradually transformed from ideas to reality under the development of virtual reality technology. The combination of virtual reality technology and display space design provides the audience with more real experience, strengthens the transmission of information, and maximizes the function of display space.

## 2. Concept and Development of Virtual Reality Technology

Virtual Reality technology referred to as VR (Virtual Reality) technology, is based on computer graphics in the Virtual space realistic representation of the real world, the combination of multimedia technology, sensor technology and mimic the one who has a visual, auditory, tactile senses such as operating environment, and then through the helmet mounted display (HMD), data gloves and other auxiliary sensor equipment, to provide the audience an interaction with the Virtual worlds, observation of 3 d interface, make the audience can directly participate in and explore the simulation object in the role of environment and change, produce immersive. This kind of virtual world composed of computers can be the reproduction of the real world or the imaginary world. American scientists Burdea g. and Philippe Coiffet once put forward a "Virtual Reality Systems and Applications" in the paper "Virtual Reality Systems and Applications" published at the world electronics conference in 1993, which simply expressed the three most prominent features of Virtual Reality: Immersion, interactivity, imagination, that is, virtual reality "3I" characteristics, up to now, virtual reality technology in the three basic characteristics of further changes.

Virtual reality technology is first applied in military, medical and other fields. In 2014, Facebook acquired Oculus for \$2 billion, and Google I/O launched VR eyebox Cardboard. VR technology entered the life of the general public in an instant. With the popularity rising, 2016 became the first year of explosive growth of VR. In the field of design, the update of technology greatly affects the design expression, design thinking and so on. In the past, the effect of design works has always

depended on PS, SU, 3Dmax and other software. Therefore, the emergence of virtual reality technology has provided a perfect opportunity for the defects of traditional design expression. How to combine virtual reality technology with design skillfully to promote the development of the design industry is worth studying.

### **3. Virtual Reality Technology and Display Space Design**

Exhibition space is an important communication bridge between the exhibits and the audience. The space designer needs to closely combine the exhibition side, the exhibits and the audience through the design to make them perceive each other. As a medium, virtual reality technology can expand people's function and enable them to perceive or control previously unreachable objects. Therefore, the combination of virtual reality technology and display space design will bring more in-depth real experience to the audience and provide a more convenient way of information transmission to the exhibition side. The research on virtual reality technology in the field of design is particularly important for the relationship among designers, exhibitors and audiences.

### **4. Application Value of Virtual Reality Technology in Display Space Design**

#### **4.1 Strengthen the Interactive Experience between Exhibits and Audiences**

Facing the dazzling exhibits, the audience seems to have a variety of choices, but in fact, due to the lack of interactive experience, they can only passively receive information. This will "push" exhibits show audience of traditional pattern after years of development has entered a bottleneck period, and the display space design of developing in recent years, the pursuit of design innovation points, designers will explore different cultural elements and texture of special materials, which often will focus deviation to display modelling, exhibition stand and beautiful, and there is no real solution exhibits and the problem of interaction between the audience. When the audience is confronted with an unfamiliar exhibit, the traditional static display means still cannot bring the audience a more profound understanding of relevant exhibits. Strong interactive demand innovation revolution will be display space, the virtual reality technology brought about by the interactive space environment simulation, to break the constraints of time and space, get rid of the rigid and static display mode, make the audience into fancy display environment, by the previous passive accept into active exploration, to better stimulate the audience understanding of the exhibits. At the same time, exhibits in the virtual reality space can better show its details and connotation, so as to deepen the interaction between the audience and exhibits experience.

#### **4.2 Bring Unlimited Exhibition Space to Meet the Needs of the Exhibition Side**

In many cases, due to the limitations of the exhibition site environment, safety and other issues, the exhibitor will choose to exhibit the exhibits when arranging the exhibition, which will cause some regrets and losses to the exhibitor and the audience. Built by virtual reality technology under the simulation environment of space, broke the time limit of the space, will limited entity display space to expand into the virtual world of the infinite, not only can enrich the exhibits diversification, also has brought more show Angle and way, which makes people in the virtual scene in a pleasant way to feel more relaxed cognitive more exhibits, gain more experience of exhibits.

#### **4.3 Optimize the Design Process to Facilitate Communication between the Exhibitor and the Designer**

In the process of exhibition space design, the communication between the exhibition side and the designer is particularly important. The simulation environment created by virtual reality technology can make the exhibition side truly feel the display scene and design intention. The exhibition side can observe the space from any Angle and distance, and can switch different effects in real time, so as to strengthen the communication between the exhibition side and the designer, and to facilitate the comprehensive inspection of space layout and construction in the later stage. When designers

change the virtual space to display the space construction, they can have an intuitive and practical feeling about the space layout, material texture and technology, etc., which not only brings more design ideas, but also greatly reduces the design working time and effectively improves the work efficiency of designers. The combination of virtual reality technology and display space design not only optimizes the design process but also brings more creative space and possibilities.

## **5. Application Prospect of Virtual Reality Technology in Display Space Design**

### **5.1 Virtual Reality Technology is the Inevitable Trend of Information Communication in the Future**

From the traditional picture text to image recording and dynamic video, the progress of science and technology constantly enables people and the way of interaction between the perception of all things, virtual reality is a revolutionary new express way, expanding its people's perception or control field, constantly bring new immersive experience, at the same time, people will increasingly rely on feeling and the pursuit of the simulation. Such immersive experience makes virtual reality become a super human-computer interaction terminal in the future, and gradually forms a virtual social communication terminal, and finally integrates into all aspects of people's life and becomes a super application terminal.

With the arrival of the information age, photography, modern audio and video, computer simulation and other technologies have been used in display design. The appearance and application of these high and new technologies and materials help people form a new way of receiving information on the technical level, and then bring changes to the display design in the way of thinking and design methods. In the future, with the mature use of 5G technology and the continuous development of cloud computing, the application of virtual reality technology will become more mature and extensive, and its importance will become increasingly prominent in promoting the communication between people, people and matter, and people and the world.

### **5.2 New Requirements for Display Space Design**

Exhibition space design in China started late, there is no perfect design system, but China's existing exhibition volume is very large. With the development of society, people's demand for exhibition is gradually increasing, and the exhibition hall is also expanding. Thus, the market potential of virtual reality technology in China's display industry is obvious. The information society also brings more ways for people to obtain information, which also promotes the continuous innovation and development of display design. New materials, design concepts and expression methods in display space design all present the development trend of diversification, interaction and virtual reality.

Under the contemporary social background, the demand for exhibition space is increasingly high, especially in the information technology, art and other aspects of the pursuit of continuous improvement. In recent years, more and more researches have been conducted on virtual interaction. The demand of display space for interaction will also promote the direct integration of virtual reality technology and design, so as to greatly increase the audience's interest in exhibits, so as to have a deeper understanding of exhibits information and finally bring feedback from the audience. Therefore, the design of exhibition space needs new technologies to bring new inspiration, and its development also needs the support of new technologies such as virtual reality.

## **6. Conclusion**

The emergence of virtual reality technology has affected many areas of life, and it has built a good communication bridge between reality and virtual space environment. Properly applied in the design of exhibition space, on the premise of ensuring the high accuracy and precision of exhibits information, it will enhance the sense of experience of the audience, improve the audience's acceptance speed of exhibits information, and give the audience real active choice, so as to meet the

personalized needs of the audience. In the future, the design of exhibition space will combine the traditional form with the new technology more, and the two will take their own advantages in the effect of conveying information. No matter what kind of display space, the future virtual reality technology soybean milk plays an increasingly important role.

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