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# Research on the Application of Virtual Reality Technology (VR) in Landscape Design

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***Abstract:*** With the continuous acceleration of urbanization in China, the construction scale of landscape gardens is constantly expanding, which can optimize the urban environment while bringing people pleasure, highlighting the ideas of the modern landscape gardens. However, due to the complexity of the garden design and in order to achieve a good viewing effect, the relevant designers should attach great importance to the use of virtual reality (VR) technology, optimize their design patterns, making the garden more interactive and perceptual and giving people a good viewing experience.

***Keywords:*** Virtual Reality Technology; Landscape Design; Application

## Introduction

VR plays a prominent part in garden design, which can reduce the number of modifications at later stages. Incorporating VR in the preliminary design to simulate the construction plan of the site is more in line with the current natural landscape of the city and people's viewing needs. It could show the design concept of humanization and flexibility, improve the work pattern of garden design, reduce the pressure of designers, and make landscape design more in line with the development of modernization.

## 1. Overview of VR technology and the application value in landscape design

## 1.1 Connotation

VR is a new technological solution derived from the continuous improvement of China’s technological level. It takes computer user interfaces as the main body to realize the interaction between different senses. This can offer users various conveniences and reduce the user's burden in operation, so that the efficiency of various works can be comprehensively improved. The operability and visualization of VR are relatively prominent. By combining the actual needs of users with environmental design, it could build a good operation and collaboration mode, and discover the problems that existed in the current garden design in a timely manner to improve the overall design effect [1]. Compared with other information technologies, VR is more interactive and perceptive. It can feed back the development process of different factors through the interaction of factors in the environment, and build a more virtual environment scene according to its own functions, reflecting the degree of correlation between the various factors. This technical solution itself has outstanding advantages in its application and is highly professional, which enables the interconnection between various elements and improves the overall design patterns to enhance the overall working effect.

## 1.2 Application advantages

With the continuous acceleration of urbanization in China, the number of gardens in the city is constantly increasing. Thus, people's demand for landscape architecture has also become increasingly higher. In order to improve the overall design effect, relevant designers need to change the previous extensive working mode and choose new technical solutions to continuously improve the overall design ideas. For example, through the use of VR, we could have a scientific planning of

space and enriches the current garden design patterns. And with stringent requirements, we could carry out a preliminary simulation to supplement the garden design plan in a short time. And the design effect of the 3D drawing can also facilitate the subsequent construction, which greatly improves the overall construction efficiency. In addition, when using VR, designers are able to exchange information more quickly, and scientifically arrange the garden scenery in multiple aspects to improve the overall design effect.

Secondly, the integrated physiological and ecological aspects of landscape design have effectively improved the development of the design industry by building a comprehensive design system through the integration of knowledge from multiple disciplines. In the design of landscape, it is necessary to match with modern art and extract the essence of the previous design to optimize the overall design plan, which will be more in line with the pace of modern urban development. Therefore, the overall design level will be improved through innovation [2]. In addition, in the actual design, the surrounding environment and ecology should also be considered, and the two should be integrated with each other, such as understanding the growth characteristics of vegetations and their needs for the surrounding ecological environment, so as to integrate with the garden design and avoid certain damages to local plants to gradually improve the overall design effect. Finally, the design shall also follow the principle of aesthetics. Since the garden is not only a place for leisure and communication, but also for relaxing after their work. Therefore, it is necessary to consider the aesthetic design concept, so that people can leave a deep impression in their minds, and relieve the bad emotions in their hearts. All of the above work requirements need to use VR to break through the limitations between various factors, form a complete whole for the scientific planning, so that the garden design effect and level can be comprehensively improved to meet the viewing needs of modern people.

# 2. The specific application of virtual reality technology in garden design

## 2.1 Plane space design

When applying VR in garden design, it is necessary to divide the overall work into different work systems, and gradually improve the overall design plan, so that the effect of garden design can be comprehensively improved. First of all, in the design of the plane space, we should pay attention to the coordination between different factors. Through the matching of lines and graphics, we could simply express the regularities and basic conditions of the garden, and coordinate the surrounding buildings and ecological environment. In the actual design, the collected data should be entered into the system platform. Combining with VR, we could make an initial environmental simulation map and coordinate the influencing factors on the site [3]. Secondly, in the follow-up design, it is necessary to meet the dynamic design principle, by which the expression of space design could be shown more freely and flexibly. We should not only use lines for composition, but also set different greening levels through different methods of expression, making the whole effect more obvious and meeting people's viewing needs in the garden. When using VR, it is necessary to update the data in time. If there are new changes in the site or if the designer has new ideas, the values should be entered into the VR technology to regenerate the corresponding data map. According to the local natural features and the design requirements, we could construct a new type of simulation map and compare them with previous plans to find the best design scheme to improve the overall design effect.

## 2.2 Rational planning of planting space

Reasonable planning of planting space can not only enable the optimal allocation of resources, but also help to display the important advantages of plants in terms of purifying the air, so as to improve the overall design effect. Therefore, in the actual design, designers need to focus on reasonable planning of plant configuration, integrating advanced VR, and matching the ecological environment of the city, so as to improve the overall design plan. In order to reduce the waste of resources and avoid the problem of subsequent rework, the relevant designers can first enter the information of different tree species and their own design ideas into the VR and then build a 3D model. They should consider the relationship between different plants and planting locations with a macroscopic perspective, so as to plan the overall space more scientifically to avoid any impact on the subsequent design. When introducing exotic species, it is important to understand the growth characteristics of the plants and their requirements for the surrounding environment beforehand. Information of the exotic species can be entered

into VR for simulation to understand the coordination between the plants and the native plants during their subsequent growth, determine the number and types of the introduced exotic species of trees, and gradually improve the overall design scheme to avoid certain impact on subsequent plant growth.

Secondly, the scientific combination of colors is important in the design, matching a strongly hierarchical and colorful plant community to meet the people's viewing needs to constantly improve the overall design effect. In the actual design, it is necessary to implement the principle of work according to local conditions. We should use the VR to plan in advance the key space of greening and build a characteristic garden landscape design model according to the characteristics of the urban culture. In addition, we should also pay attention to the matching and coordination between plants, such as the combination of the arbor, shrubs, and grasses as well as the combination of deciduous species and evergreen trees, following the working principle of biodiversity to improve the overall design effect. It can not only meet the design standards of the original plan, but also contribute to the beautification of the urban environment.

## 2.3 Optimization of the main idea

In previous designs, designers would use drawings, which could not directly stimulate the senses through a more intuitive model, resulting in the lack of innovation and personalization in the design plan. Meanwhile, the contradictory problems in plant combinations are also prominent. Therefore, in actual work, relevant designers need to integrate advanced VR to improve the overall design plan. When observing the 3D images, our inspiration and creativity are stimulated, which can help to improve the content of the landscape design drawings. Secondly, due to the complex factors in the garden design, different influencing factors need to be considered in the actual design, such as the relationship between space and culture, and so on. Therefore, the designer must first construct the main idea through VR and then start from the main body, continue to improve the content of the branch. We can also carry out the scientific simulation of the plan when applying the VR, so as to find the problems in the plan in a timely manner. Through the supplement and perfection, the overall design scheme will be more suitable for the current urban development status quo. In addition, some designers can put their ideas in specific models with VR when their inspirations emerge during the design process to prevent the loss of inspiration, which could affect the design.

# Conclusion

The application of VR plays a prominent part in the current garden design, and it also has a good development prospect. Therefore, relevant designers need to attach great importance to the use of VR and master the core technology solutions. We should begin from the starting point of modern garden design, scientifically coordinate different factors such as space and culture, construct the main design ideas and improve the corresponding aspects in garden design, so that the garden design can have both ecological and artistic characteristics to improve the overall design effect.

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