

Color Effect of Low-Cost Plant Landscape Design Under Computer-Aided Collaborative Design System

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Abstract. With continued socio-economic progress and the development of computer software and hardware technologies, computer technology is widespread in all areas. In the landscape architecture industry, computer-related assistance software is used by landscape architects with accuracy, speed and comfort characteristics, making it an excellent practice in interior decoration, advertising design and urban planning, However, application landscape planning and development have been relatively slow in recent years. With the further development of landscape design computer graphics production software, computer graphics production software can also be a better practice for landscape design in application development. Virtual reality is very real and real, and the combination of virtual design with real environments introduces the immersive virtual reality of landscape paintings into the party, so that landscape design can work more shockingly. This article presents the current state of the art of landscape design and landscape design processes as well as computer-based design software for the process, by introducing different software to understand the advantages and disadvantages of different software. A better selection of the corresponding computer-supported software will be disseminated.

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1 INTRODUCTION

Since entering the twenty-first century, with the rapid development of various computer hardware and software, computer-aided software as industry software, it has been widely penetrated into the various landscape design works [1]. Especially in developed countries in Europe and the United States, in the mid to late 1980s, computer-aided design using the relevant software is basically

developed more mature. This aspect of technology started late, until entering the 21st century, with the country's comprehensive strength, the growing team of talent, computer-aided design software applications to keep pace with Europe and the United States, has been leaps and bounds of development [2]. In the landscape design, the following processes are usually required: first of all, drawing two-bit plan, then using the plan to three-dimensional modeling, and finally rendering and processing of three-dimensional exported pictures, that is, in the corresponding process corresponds to the creation of different computer-aided design software to draw the landscape map [3].

Guang Sheng et al. [4] proposed that in the choice of computer-aided design software to draw the landscape map, mainly computer-aided design software has the following advantages, first of all, the drawing size proportional coordination, high precision, followed by a significant reduction in drawing time, colorful, intuitive and realistic effects, and easy to modify, carry, save, reusable, etc., which greatly improves the efficiency of work in complex landscape design. In the drawing of floor plans, Motealleh et al. [5] mentioned that CAD is developed by the U.S. Autodesk, which is widely used in various engineering design industries, such as large-scale engineering and construction, decoration industry, advertising industry and so on. With the continuous upgrading of the CAD version, it has become more and more functional, and CAD has become one of the most widely used computer-aided drafting and design software in the world [6]. It is the software of choice for twobit plan drawing in landscape design, such as various drawings produced by landscape design: landscape architectural drawings, landscape design drawings, landscape construction drawings, etc. In landscape design, Othman et al. [7] mentioned that landscape design will use a variety of elements and materials, and the elements and materials will change differently according to different scenes, but CAD has powerful elements and drawing functions to meet the needs of landscape designers, so as to complete the relevant drawing design work [8]. Another two-bit graphic design tool is Corel DRAW, a graphic software developed by Corel Canada, which is widely used in the advertising industry. functions, etc. Usually in landscape design and production, editing functions such as plan modification, copying and deletion are involved, and Corel DRAW's editing commands are very easy to learn [9]. Corel DRAW can draw smooth and precise curves that cannot be drawn by CAD by changing the smoothness of the control points and other commands, for example, in twobit planar graphics, you can use a combination of hand-drawn curves, Bessel curve tools, graphic creation commands and rich tools to complete a variety of colorful two-bit planar graphics, and then export different file formats, such as dwg format that can be opened with CAD or imported into 3D modeling software by Villagra et al. [10]. Corel Draw is also compatible with many CAD and Photoshop related functions, it can handle both curve and color graphics, vector and vector graphics by Uhl et al. [11]. Of course, Corel Draw has many other advantages that CAD and Photoshop do not have, so I won't go into them all here.

With the continuous improvement of people's material living standards, the requirements for the living environment are also getting higher and higher [12]. The construction of gardening is an important part of China's urbanization development, which has an important significance and role in enhancing urban air quality and improving the natural environment. As the development of the city and the construction of green space has a certain point of contradiction, so we can not continue to use the traditional form of greening, garden plant color and matching and landscape design, can effectively use space, conducive to improving the urban microenvironment. This paper analyzes the characteristics of current urban landscaping and explores the strategies of garden plant color and matching and landscape design. In the process of urbanization development, we must look at the problem with a development perspective, the expansion of urban construction is inevitable, so how to improve the urban environment is our primary consideration. The purpose of landscaping project is to create an environment with natural atmosphere for the majority of residents and add green to people's life in the city of steel and concrete, exploring garden plant color and matching and landscape design can help to improve the overall effectiveness.

2 THE DIRECTION OF DEVELOPMENT OF MODERN LANDSCAPE PLANTING

2.1 Current Landscape Design

Garden plant color and match with landscape design optimization, can effectively improve the environment and vision of local areas of the city. In our cities, buildings are getting taller and taller, and many people feel that the view of the city is full of reinforced concrete buildings, which gives people a "depressed" mood, but adding some greenery to life will regulate people's mood and nerves. Garden plant color and matching and landscape design, after recent years of development, has shown that compared to traditional greening, it can increase the greening area, improve the aesthetic effect, and is better than traditional greening forms in eliminating noise, and can also effectively improve the internal air quality, as shown in Figure 1. By optimizing the color and matching of garden plants and landscape design, it gives people a comfortable and beautiful feeling and indirectly relieves their anxiety. Most of the construction sites of landscaping belong to artificial environments, so many green plants have to be selected with plant vitality in mind, otherwise it is difficult for plants to survive in noisy, or shallow-rooted places. Such a situation also caused the current greening material available to choose the style is not much.

In addition, green plants in the care and maintenance of economic issues to be taken into account, many plants are rarely taken care of, so the need for green plants can adapt to arid, infertile land, themselves also have to adapt to the local light, both pest resistance and other capabilities. Between these realities, the planting of greenery is relatively single, and many are chosen from low shrubs or hardy herbaceous plants. Greening is dependent on the outside and top of the building growth, although there are many places to plant, but people still choose some planting and maintenance costs are low, such a situation leads to greening technology is simple, many greening garden are still in the beginning stage, there is no more creative and breakthrough, but also led to the form of greening. Greening in the construction phase is different from the traditional greening project, the need to work on the color, and many past experience is not applicable to the current greening construction, so the construction cost is even higher than the traditional greening mode more than double. In addition, the greening planting range is small, more will be a local area, and by environmental factors to choose some shallow root system, high survival rate, disease and insectresistant plants, the daily care and maintenance of its economic costs are higher. China's current greening still belongs to the initial stage, most of the construction has been completed or has been used for a period of time before the greening planning, but at this time in the design has been subject to the constraints of the building itself, cannot form the most optimal greening design program, but caused a late waste of human, material and financial resources.



Figure 1: Garden plant color and matching and landscape design.

2.2 The Natural Illusion of Color

Color is the visual perception of visible light stimulating the visual nerve, through the study found that people's attention to the color of the object is much higher than the shape of the object.89 In addition, color and human feelings are closely linked, different wavelengths of color will give rise to different color physiological response and psychological response with emotion, such as the color of warm and cold, hard and soft, strong and weak, light and dark will give people different feelings. Therefore, color is the most eye-catching landscape element in the landscape environment, the color of the space constituted by the tone can directly express the regional landscape imagery. The landscape environment we live in is full of natural colors and artificial colors. Natural colors refer to the colors inherent in nature, such as land, mountains, plants, rivers, sky, etc.; while artificial colors refer to the colors mapped by objects created by people in the landscape environment, such as buildings, structures, transportation facilities, advertisements, etc. The reasonable combination of artificial color and natural color can create a variety of landscape tones, thus showing the cultural characteristics of the site, such as wood yellow tones of Paris, France, red and gray tones of Florence, Italy, etc.. However, the current color in China's urban landscape has a lack of color performance and color blind abuse of the problem, through the comparison can be found that most of the urban landscape lack of color matching skills of architectural color makes the urban landscape lack of good, and unlimited commercial advertising and make the landscape into a noisy color frequently, gaudy and chaotic situation, while the natural law under the constraints of the color relationship, in the human visual psychology is tending to perfection. Therefore, people have a stronger pursuit of natural colors. Resort as the pursuit of natural visual enjoyment of the place, natural color in the resort landscape is particularly important, and artificial color is also the resort landscape inaccessible part, so it is important to coordinate the harmony between natural color and artificial color. Green as a natural landscape as a common tone, can give a fresh and relaxed, vibrant, hopeful aesthetic feeling, so in the resort naturalistic landscape, should be green plants as the main color in the place, artificial color as far as possible to nature inherent, low-saturation color to match, not to destroy the natural tone in the place. For example, the color matching in Naked Heart Valley takes the green color of plants as the color tone, and the artificial colors in the site are all expressed by using the materials in nature. In the architecture, similar colors are used to form a unified tone, which will not make the colors look messy; in the paving, colors similar to the color of the land are used, which weakens the artificial traces. And the artificial color in the landscape environment has a small area scale, which will not destroy the hue created by the natural color at all, so the color in the site creates a very comfortable natural atmosphere (Figure 2).



Figure 2: Color matching management.

For example, in the Flower Trails-Without Thought Resort, the area of the site is small, so the area and density of the building is large, which makes the artificial color of the site and the natural color

ratio is relatively even, but the site through the combination of similar colors between the paving and the architectural miniature collocation, so that the color of the landscape environment makes people feel stable and soft, will not make the artificial color too bright, in addition to the building color through the interspersed way of cold and warm Matching, so that the color tone of the landscape space both maintains a balance and has a sense of rhythm. In general, the site is saturated with natural colors, and the artificial colors are hidden under the natural colors, which makes the site not only have a strong natural atmosphere, but also have a certain coherence of spatial colors, as shown in Figure 3. From the perspective of site construction, the height difference of the terrain has a direct impact on the site's climate, traffic and activities, etc. The size of the slope variation determines the site's utilization potential and development value, too small a slope lacks visual changes, too large a slope is not conducive to development; the undulation of the slope shape also affects the temperature change, the temperature change of the raised terrain is more stable, the temperature change of the depressed terrain is more extreme The topography of the higher area has the disadvantage of strong wind and rain, wet and fog, although the scenery is pleasant.90 From the perspective of ecological protection of the site, natural topography usually has the characteristics of sensitivity and vulnerability, if we pursue the external form of beauty without considering the natural laws of the site topography, it may cause a variety of natural disasters. In addition, natural topography is usually rich in natural resources, if not properly developed, it will directly lead to the consumption and disappearance of natural resources. If these problems are not handled properly, not only can the natural topography of the resort not be reflected, but also will cause serious damage to the topography of the site environment. Therefore, the naturalistic landscape design of the resort must take the topography of the site as the primary consideration, and make reasonable development according to the characteristics of the topography, so that it provides a guarantee for the creation of naturalistic landscape of the resort. For example, the Lava Resort in Portugal has a unique landscape view due to its excellent topography, relying on the Pico Mountain peak and quarding the Santo Amaro Bay, but the natural landscape is also accompanied by a complex topography, and the rugged terrain of the site makes the construction of the resort very difficult. Instead of the common development practice of flattening the site, the landscape was planned on top of the original topography. The buildings avoid the complex terrain and are scattered in the flatter areas around the site, while the uneven topography of the site is effectively mitigated by the vegetation. The design of the building barely changes the original topography of the site, yet it blends harmoniously into the site.



Figure 3: Spatial color management.

The construction aspect is aimed at the selection of green plants themselves on the study, for garden plant color and matching and landscape design, with some countries in Europe and the United States there is still a certain gap. Therefore, we suggest that the government-led, increase research on

landscape gardening, give support in terms of funding, and greening into the subspecialty of urban gardening projects, focus on research institutions and institutions of higher learning related to the work of research and development, so that more talents dedicated to the study of the development and innovation of greening, and actively learn from the advanced experience of foreign countries, and strengthen the exchange between greening regions and countries, so that more technology into our country, but also to focus on the communication between the two sides of the talent training experience. The development of garden plant color and matching and landscape design cannot be aimless, but to have a clear development direction and development goals, as the saying goes, "no rules cannot be square", although the gardening is still in its infancy, but cannot let it "barbaric growth". The relevant government departments should focus on the standardized management of this new landscape model, so that the legal department, scientific research departments, technical departments and other joint construction standards, the development and improvement of planting standards. Standards and norms should be flexible within a certain range, as China's landscaping is still in the exploratory stage, need to find the law in the continuous forward movement, leaving some room for future optimization of standards. Greening in effect is better than traditional type greening, but the economy still lacks competitiveness, many people have not yet noticed its strengths and advantages, the government should play an active leading role in this regard, and increase the positive publicity of greening. The development of landscape greening of garden plants cannot stick to the rules, we have to continue to innovate in the process of design and development, can no longer be carried out in a single planting, but to develop more new varieties. Encourage scientific research structures and researchers to spend more energy to select and cultivate plants suitable for greening, and to experiment and cultivate according to the characteristics of the natural environment in different regions, so that the greening of each city can be shown in the form of plant diversity. At the same time, we should promote the exchange of greening between different regions and the interchange of experience between different regions, and for some good attempts and good methods can be experimented and promoted, constantly looking for ways to reduce costs and develop a more scientific and reasonable strategy for the later maintenance and management, trying to make the economic cost of landscape greening reach below the cost of traditional greening.

3 COMPUTER COLLABORATIVE DESIGN

3.1 3D Modeling Software

That's why Photoshop is widely used in image processing, regardless of the industry, and that includes landscape design. When rendering images, by adding blue sky and white clouds in Sketch Up to get a better realistic effect of light and shadows as well as reflections, this can greatly increase the computer computational processing practice, which is very tedious and time-consuming. And in Photoshop to add scenery is more flexible, convenient, intuitive, in time processing and threedimensional modeling rendering processing than also much faster. So, in the process of landscape mapping, to deal with the advantages and disadvantages between three-dimensional software and two-bit flat software, the use of good characteristics of each, the formation of a good complement. Usually the picture rendered in Sketch Up to be processed in bitmap format (of course, you can also choose other picture formats) into Photoshop software, which is to add trees, flowers, plants, people, etc. for mapping rendering, followed by processing the corresponding details of the picture, and finally to complete the presentation of the entire landscape effect. Adding the appropriate material assignment is usually completed with the following steps: first import the RGB image with mapping into the photo shop, then select the mapping material you want to use and copy it to the desired location. Then use the corresponding menu commands to change the width value, select the additional pixels for the selected assignment, and then select the corresponding tool to remove. Copy and then insert the inserted card, adjust it to the desired position and then use the command "strg +T" to adjust the size and orientation. At the same time, the layers of the inserted card are copied separately and later inserted into several places, e.g. B to layers of the map that were copied

under the actual object for displaying shadow effects. In this process, you must control the angle of rotation and determine the desired effect based on the effect card that is rendered at the angle of the actual shadow, e.g., B the associated building or mountain. The aim is to create a shadow, a unified and harmonious building.

3.2 Synergy of Color Management

As the most sensitive visual representation, color has a direct impact on the shaping of the environmental landscape, and color can give people different feelings at the sensory and conceptual levels. On the sensory level, people's reaction to color includes the sense of temperature, distance, weight and strength; on the conceptual level, it includes the meaningful connotation formed by various associations and symbols.104 Therefore, the use of color elements is an important way to strengthen people's sensory level and conceptual level. Natural color elements refer to the use of colors extracted from nature in the landscape environment, so that the landscape can create a natural atmosphere. However, there are about two to eight million kinds of colors in nature, and there is a rich variety of colors.105 The use of natural color elements is naturally not to copy all-natural colors into the landscape, but to use color elements reasonably according to the atmosphere to be created in the site, and to meet the needs of human sensory level and conceptual level. No matter what type of landscape environment, the color scheme should be clear in the main color, and the coordinating and contrasting colors should be matched with each other, so as to create a harmonious visual environment.

In the color selection of the road, the vignette and the building facade, the resort chose the color with lower saturation in nature, as shown in Figure 4, such as earthy yellow, gray, beige, brown and other coordinated colors, so as to increase the color level and color transition of the landscape. The roads are chosen to be yellowish to give people a feeling of being based on the natural earth, and the buildings are chosen to be hidden in the natural colors without color tendency. The resort through the control of the site landscape color, so that the site tone is very harmonious and unified, creating a natural rustic landscape atmosphere. Another example is Yunfeng Mountain Hot Spring Resort through the extraction of natural color elements, so that the building is cleverly hidden between the mountains and forests, the resort is located at the foot of the famous Taoist mountain Yunfeng Mountain, so the color of the building façade in the resort is chosen to be unified with the mountain peaks of light gray, green, dark gray, etc.



Figure 4: Color Distribution Management.



Figure 5: Color Contrast Management.

In the integration of natural modeling elements, first of all, we should clarify the natural properties and cultural connotation of the site, the message conveyed by the modeling elements should be consistent with the atmosphere of the site, according to this to choose the corresponding natural symbols to make the modeling elements harmoniously integrated into the site environment, as shown in Figure 6, such as coastal-type resorts should be selected with the sea-related natural elements, mountain-type resorts should be from the terrain or wild flora and fauna The corresponding natural elements should be extracted from the terrain or wildlife. In addition, in the design of the modeling elements, we should pay attention to the perceptiveness and recognition of the modeling elements, modeling elements should not only have individual characteristics, but also be able to produce commonality with tourists, so we also need to understand the site visitors to the natural form of cognitive and familiar degree, so as to further establish the corresponding natural modeling elements. The resort has cleverly integrated the natural form elements into the site, conveying the cultural connotation of the site. The resort is rooted in the dry forest of the sandy coast, and the site is unique in its topography, but it is this unique topography that provides a habitat for wildlife. The resort therefore preserves this natural landscape environment, and the architecture draws inspiration from the natural landscape. The building form incorporates the natural symbols of the landscape in the form of blocks of rock, making the building highly compatible with the site. The architecture is no longer hidden in the natural environment or serving the visitors in a one-way manner, but becomes a part of the whole landscape environment, conveying the natural culture of the site to the visitors in a natural gesture.



Figure 6: Distribution of visual space elements.

Natural materials refer to the formation of natural materials in nature, as landscape design materials to see, to have a strong self-repair and regeneration ability, common landscape natural materials mainly include raw earth materials, bamboo and wood materials, as well as stone. Natural materials as part of the original in nature, it has a natural spirit and temperament, when the machine manufacturing almost covers all the materials in our life, people for the irregular, mild materials in nature become more aspiring. In terms of appearance forms, the different composition of the raw soil and the differences in the environment result in a variety of colors such as yellow, black and red, which are very colorful and malleable and can be used to create forms of complex and diverse forms, as shown in Figure 7. Therefore, the raw soil material has a good decorative function in the landscape. On the one hand, the inherent earth color of the raw soil material can be coordinated with the landscape environment, on the other hand, the raw soil material can evolve into a variety of deformation methods such as grass clay, light clay and modal clay, which makes the raw soil material get rid of the primitive state of the original adobe firing and can be applied to the landscape environment in a more modern and artistic expression.



Figure 7: Multi-earth visual representation.

In linguistic expression, land not only symbolizes the return to nature, but also is the origin of human ecological concepts. As the material basis for plant growth and an important place for people to live and produce, the land has been treated with respect by humans since ancient times. The ancient concept of feng shui emphasizes that "everything cannot be born beyond the earth, and man is one of everything." It is also said in "A Brief Guide to Geography" that "Heaven and earth are full of earth, people are born in earth, return to earth, divine residence and burial, ancestral earth only." From this we can see the sacred status of the land in people's hearts, and it is because in ancient times people's non-manipulability of the land that people perceived the concept of "following nature", so the land conveys this original spontaneous ecological concept.

4 CONCLUSION

Landscape design is particularly important, as today a variety of tourist attractions explode. How to better understand landscape design results and promote landscape projects through computerbased software is a very important tool. Computer-aided landscape effects with unique and excellent designs influence and change the current trend of the landscape map display. The landscape effect is also more realistic, stronger, has a stronger sense of hierarchy, and the colors are richer. It has become an important means of exhibiting products in landscape planning and design. The complexity of landscape design itself is a certain difficulty in its development, but I think that the development of society and technological progress will create a new era for the landscape design industry. Garden plant colour and matching and landscape design are an unavoidable trend in the development of the current garden construction with features such as environmental compaction, air cleaning, noise reduction and improved green covering of the city. It also creates a social value that meets the needs of the urban environment and people who can improve the miniature ecosystem. In order to promote the healthy and orderly development of urban construction in China, we need to delve deeper into the potential value of ecologisation, explore from different perspectives such as science and economy, and promote color diversification, diversity diversification and diversity matching.

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