Study on the Trend of Landscape Interaction in Urban Landscape

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Abstract: as an Important Part of Urban Design, Urban Landscape Design Has Received More and More Attention in Recent Years, Which Shows That People Have Put Forward Higher Demands for the Construction of Spiritual Civilization in the Process of Urbanization. with the Rapid Development of Science and Technology and the Emergence of Diversified and Personalized Needs, People Have Put Forward Higher and Newer Requirements for Urban Landscape Image Design. Urban Landscape Design Has Always Been Closely Linked with Art, and They Interact with Each Other. as a Place for People's Daily Leisure and Entertainment, Urban Landscape Has a Certain Degree of Attention in Terms of Function and Effect. Therefore, People Are Not Only Satisfied with the Needs of Landscape Function for Urban Landscape, But Also Want to Join the Humanized Way to Interact with the Landscape. This Paper Takes the Landscape Experience Design as the Main Entry Point, Summarizes the Design Techniques and Concepts of Experience Design in Urban Landscape, and Analyzes the Design Points, Principles and Methods.

1. Introduction

In Recent Years, with the Gradual Acceleration of the Pace of Urban Construction and the Increasing Number of Theoretical Researches on Urban Construction, the Urban Environment Has Begun to Receive Attention from All Aspects. Each City Has Gradually Increased Its Efforts to Improve the Urban Landscape Environment, Setting Off Another Round of Construction Climax of Urban Parks and Green Squares [1]. with the Rapid Development of Science and Technology and the Emergence of Diversified and Personalized Needs, People Have Put Forward Higher and Newer Requirements for Urban Landscape Image Design. Urban Landscape Design Has Always Been Closely Linked with Art and Influenced by Each Other. However, Nowadays Landscape Design Has Involved in Many Scientific Disciplines, But It is Still Deeply Influenced by the Ever-Changing Art Field [2]. Some Cities Still Have Some Wrong Ideas and Practices in the Construction of Urban Landscape. for Example, Many People Understand Urban Landscape as a Variety of Trees and Do More Greening. They Do Not Quite Understand Its Significance and Connotation [3]. Whether It is Profound, Implicit, and Subtle in Traditional Gardens or Simple, Ecological and Realistic in Modern Gardens, It is Closely Related to Various Styles and Factions in the Art Field [4]. Creating an Interactive Experience of Urban Landscape Visual Image That Meets the Needs of Modern Functions and Aesthetic Requirements Has Become an Unshirkable Responsibility of Designers. This New Form of Interactive Design Began to Develop Slowly, Allowing the Interactive Economic Era to Enter People's Lives [5].

Since the Reform and Opening Up, China's National Economy Has Entered a New Era of Sustained, Stable, and Rapid Development, and the City's Construction and Development Has Reached Unprecedented Prosperity. in China, Urban Design Has Maintained an Upward Trend with the Advancement of Urbanization over the Years, But It Has Experienced a Near-Saturated State in Many Aspects after Experiencing a Process of Rapid Development [6]. Everyone Wants to Live in a Beautiful Environment, So Landscape Design is Especially Important in Life. Since Many Cities Have Completed the Design of Urban Landscapes without a Certain Degree of Understanding of Landscape Design, There Have Been Many Problems in Domestic Urban Landscape Design [7]. in the Urban Landscape, People Want to See the Local Cultural Characteristics and Show Their Own Spiritual Culture. Due to the Large-Scale Excavation of Underground Space, There is a Need to Create a Connection Medium and a Bond between the Above-Ground and Underground Spaces,

and the Designers Hope to Create an Open-Ended Scale, Depth and Space through the Transformation of Space, Environment, Vision and Function. the Environment of Space [8]. Urban Landscape Space Has Important Social Functions. It is an Important Embodiment of the Inner Soul of a City. At the Same Time, It is Also the Concentration of Urban Public Life [9]. This Paper Takes the Landscape Experience Design as the Main Entry Point, Summarizes the Design Techniques and Concepts of Experience Design in Urban Landscape, and Analyzes the Design Points, Principles and Methods.

2. Regionality of Urban Landscape Design

The Concept of Regionality Contains Many Contents, and the Regionality in General Concepts Mostly Includes the Unique Natural Conditions and Customs and Cultures of the Region. among Them, the Natural Condition is the Aspect That Has Been Emphasized and Applied for a Long Time, Because It is the Foundation for People to Build a City and, of Course, the Objective Condition for the Existence of Urban Landscape. Nature and Landscape Present an Almost Coincidental Implication. This Naive Statement is No Stranger to Us, and This is Not the Case Today. Due to the Rapid Development of Science and Technology, People Have Gradually Changed from the Former Natural Causes to the Desire to Control Nature. Some Landscape Designs Do Not Adjust Measures to Local Conditions, and Some Unreasonable Foreign Elements Are Always Added in the Design. the Designer Euphemistically Calls It the Exchange and Integration of Regions, But in Essence It Only Considers Beauty and Does Not Consider Natural Behavior [10]. in the Urban Landscape Space, "Interaction" Has Become a Way of Communication, Permeating into All Fields of Our Public Space and Influencing People's Ideas and Behaviors. through the Transformation of the Surrounding Environment and the Integration of the Interactive Design Built by Ourselves with the Surrounding Environment, Human Beings Will Naturally Change Themselves from Accidental to Final Landscape. the Urban Landscape of a City, as a Result of People's Understanding of Nature and the Transformation of the City, Should Reflect the People's Understanding and Understanding of the Natural Environment and the People's Requirements and Expectations for the Humanistic Spirit of the City.

In the Parametric Calculation of Urban Landscape Architecture, the Calculation and Analysis of the Overall Structure Are Carried out, and the Elastic Time-History Analysis under Frequent Earthquakes is Carried out According to the Artificial Seismic Wave Parameters. Table 1 Shows the Maximum Acceleration and Duration of Seismic Waves.

Table 1 Relevant Parameters Such as Maximum Acceleration Value and Duration of Seismic Wave

Scope Of Adaptation	Maximum acceleration (cm/s^2)	Duration (s)	Number of wave values	Time step(s)	Effective duration (s)
Artificial shock wave	80	45	1850	0.02	33.65
Natural shock wave	75	40	1700	0.02	35.68

The training and learning process of the landscape architecture model is a process in which the error value between the output value and the expected value of the network gradually decreases until the error meets the requirements. Definition error:

$$w_{ij} = w_{ij} + a(\frac{X_i}{m} - w_{ij}) \qquad (1)$$

It is applied to the optimization of urban landscape architecture layout. The following formula:

$$E_{RME} = \sqrt{\frac{1}{P}\sum_{p=1}^{P}(E_P)^2} \qquad (2)$$

During operation, the particle velocity is updated as follows:

$$d(x, y) = \sqrt{\left(\sum (x_1 - y_1)^2\right)} \tag{3}$$

The designers of urban landscape should be people who have a natural sense of identity and belonging to the nature and humanity of the city, and should design with the goal of reflecting the unique natural environment elements and regional humanistic spirit of the city. Only in this way can people, city and nature get along harmoniously. In order to achieve this goal, it needs to be realized through the regionality and interaction of urban landscape design. Contrast is actually a kind of difference between objects, which sometimes manifests itself in one aspect and sometimes in many aspects. In fact, the integration of urban landscape design into custom culture reflects people's requirement of inheriting specific regional culture. The integration of custom culture into regional landscape design can make local people instinctively have a sense of affinity and identity. If a building wants to blend into nature, the most important aspect is to build a brand-new landscape [11]. Any integration into the landscape that has been shaped by the designer will make the landscape develop continuously. When some landscape works are carefully designed but because of their different cultures and local sources, they will naturally be rejected and ridiculed by the local people. Of course, this does not mean that people do not understand appreciation or have no tolerance, but because the landscape itself does not have the conditions to be recognized by people.

3. Methods of Constructing Urban Landscape Space Interaction

3.1 Strengthen Accessibility of Space

Accessibility refers to how easy it is for people to reach landscape space from any point in urban space. Accessibility in landscape space includes visual accessibility and traffic accessibility. The interaction of urban landscape design means that landscape is endowed with the idea of interaction with people at the time of design. Landscape has the important attribute of interaction with people at the same time as it has regional characteristics. Its root is, of course, people's demand for the humanistic spirit of urban design. People often discover the recognizable images of the landscape through vision in the first place, so as to discover whether the space is reachable. The interaction of urban landscape design requires that landscape should not be passively noticed and appreciated by people, but actively communicate with people. Sounds like such a statement is too idealistic, but in fact it is not as unrealizable as it is known [12]. In order to build an interactive landscape space, it is necessary to consider whether the space is easy to find, that is, to strengthen the identification of interactivity [13]. No matter which part of landscape design cannot exist separately from the whole, it should be considered as a whole, and the interaction with the audience should be strengthened while integrating the region, so as to promote people's further perception and experience of the city and nature.

Interactive landscape space needs to integrate adjacent spaces with different functions in the landscape to facilitate communication and interaction between various venues, and also to facilitate the generation of interactive behaviors. The first development in parametric design of urban landscape architecture layout is geometric modeling, which deals with basic problems such as geometry and shape representation of objects, research on graphic data structure, etc. The path density, node number and center potential are analyzed. As shown in Table 2. With the increase of path density, the shortest path between nodes increases. Figure 1.

Table 2 Analysis of Parameterized Design Structure of Building Layout

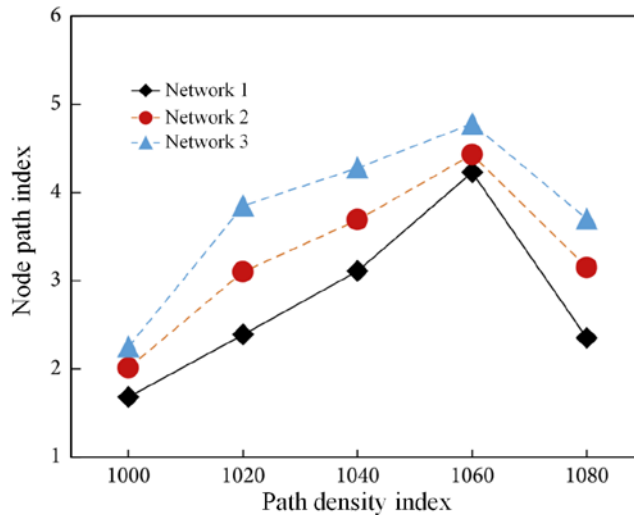| Network	Path density	Number of nodes	Central potential
Encounter information	1522	2175	0.716
Mutual information	2147	2123	0.589
Weighted summation	638	2531	0.675

Fig.1 Relationship between Path Density and Node Path

3.2 Diversification of Spatial Functions

In order to build an interactive landscape space and meet various behavioral needs, from a functional perspective, the original single spatial function in the landscape needs to be blurred and the additional function of the landscape space needs to be excavated from the perspective of the public. Physical attributes of objects are taken into account in urban landscape architecture modeling. Fractal technology and particle system are typical physical modeling methods. Fractal technology can describe data sets with self-similar characteristics. Figure 2 shows the comparison results of algorithm performance before and after storage optimization.
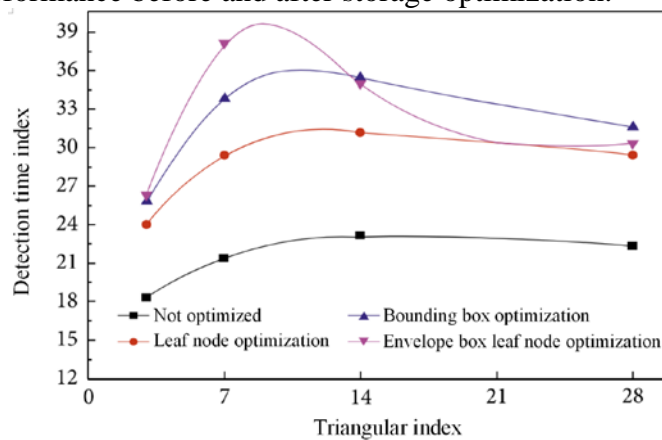

Fig.2 Comparison of Algorithm Performance Before and after Storage Optimization

With the improvement of living environment, human beings can also develop healthily. Urban landscape is the high-level pursuit of human spiritual life after certain material living conditions are met. People sublimate their hearts in the process of creating landscape, appreciating landscape and feeling landscape, and thus improve their overall quality. Effective analysis and integration can design a landscape that makes people experience feelings in the process of experience. Even when the process is over, the experience value will remain in mind for a long time. Diversified treatment methods are a good supplement to the single function of landscape space, making the original indifferent and single landscape space function flexible. The primary design principle is the principle of natural optimization and ecological protection. On the premise of protection, the development and rational utilization of resources will ensure the sustainable development of landscape design. Using interactive landscape design to combine modern popular elements with landscape can create a more harmonious urban landscape culture with nature and people. The integration of experience design into landscape brings about communication and interaction between people and landscape, enriches spatial changes and realizes spatial value.

4. Conclusion

With the development of the city, people's hurried steps no longer stay in outdoor space, and the heavy work pressure makes people unintentionally stop at the blue sky, white clouds and green leaves in the city. This paper introduces the concept of "interaction" into landscape space, aiming at changing the state of estrangement between landscape and people to a certain extent. Compared with the traditional landscape space, its biggest difference lies in its public participation. The mutual promotion and integration of interactive design and urban landscape design make the urban public space full of vitality. On the premise of satisfying the functionality of public life, the form is more diversified and contains more implication. Designers should integrate this interactive experience design idea into our urban landscape design in the specific design process. In the era of experience economy, landscape design has a broader development space under the background of "experience". Its trend and core is "experience". Experience design is the most ideal state in the future. No matter which part of landscape design cannot exist separately from the whole, it should be considered as a whole, and the interaction with the audience should be strengthened while integrating the region, so as to promote people's further perception and experience of the city and nature.

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