Discussion on Development Trend of Landscape Sculpture Based on Big Data Analysis Method

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Abstract. As the whole society pays more and more attention to the construction of ecological civilization, landscape sculpture, as an interdisciplinary subject closely related to ecological civilization and keeping pace with the times, urgently needs to seek innovation and breakthrough. The existence of landscape sculpture can make the environment produce certain characteristics, not only can the landscape mold people's sentiment, delight people's body and mind, but also leave deep impression and unique feeling to the viewer, thus producing the effect of teaching landscape education and aesthetics. Landscape this paper analyzes the development and current situation of landscape sculpture, and based on the background of big data, discusses the development trend of the new era. With the development of landscape design, sculpture is more and more widely used in modern landscape design. The emergence of time and space big data brings new opportunities and challenges to landscape sculpture.

1. Introduction

Sculpture landscape is an important element of urban landscape art, and it is the most effective way to artistically record the history and culture of the country and city [1]. In history, sculpture has always existed as a decorative object in a garden. It is a very important part of the development of human civilization, and it continues to grow and develop with the advancement of human civilization. Sculpture art is inextricably linked with architecture, garden, religion, cemetery, folk art, etc., and has become an important factor affecting the development of human culture and art and an important physical evidence of ancient art forms. Sculpture landscape is a new type of sculpture art. Sculpture landscape can be divided into indoor sculpture and outdoor sculpture according to the built environment [3]. Outdoor sculpture is also called outdoor sculpture. With the development and progress of society, sculpture began to combine with the city and gradually integrated into the city. Modern sculpture in the creation of the main object, the use of materials and space dimensions, and so on, and the creation of modern landscape architecture requirements tend to be consistent, the integration of the two arts will naturally produce [4].

Big data is made up of huge data sets. These data sets are so large that they cannot be collected, managed and processed within an acceptable time by current mainstream software tools [5]. However, the process of big data has not popularized the field of landscape design, so how to make full use of the rich resources and favorable information provided by big data to promote the development of landscape sculpture has become a research topic.
Landscape plays an important role in any regional environment. According to surveys, two-thirds of a day's time in a city today is spent in outdoor public space environments. Landscape planning and design often become a subsidiary of architectural design in environmental design, and have been passed down the landscape. Environmental effects without in-depth design are inevitable. Landscape sculpture is not paid attention to, to the landscape to only as a landscape ornament at will. Let alone play its role in energy efficiency. Today, with the development of economy and the prosperity of landscape countries, while strengthening the construction of environmental landscape, people pay more and more attention to the comfort and richness of landscape environment. At the same time, as an important element of beautifying and coordinating the landscape environment, landscape sculpture has become increasingly important. And sculpture material and shape appeared some new trends and extension and generalization. This enables us to have more methods and means to create excellent sculptures suitable for the environmental landscape.

2. Landscape sculpture

2.1 Development history
Landscape sculpture in the traditional period is more thematic, commemorative and religious, reflecting oneness and unity. On the basis of inheriting the tradition, landscape sculpture in the modern period presents non-thematic landscape sculpture, reflecting diversity, interest and more uncertainty. In the history of human civilization, ancient artists have used many forms, including architecture, gardens, sculptures, paintings, and literature, to create classic artistic complexes such as the Acropolis, Versailles, and ancient Chinese gardens. Make these human environment spaces convey richer concepts and intentions, and show stronger artistic charm. In the long history of human development, sculpture has almost been accompanied by human civilization [6]. In the past, sculpture was often used in the practical instruments of princes and nobles, or in the courtyards, mansions, temples and mausoleums, in order to distinguish social classes and create spiritual idols. The pyramids and sphinxes of ancient Egypt controlled the vast wilderness with their huge sense of spatial scale. People felt the mysterious color and majesty of nature in front of the pyramids and sphinxes. Sculpture organically combined architecture, sculpture and environment with its huge sense of spatial scale, forming a perfect image with unique regional cultural characteristics [7]. This is also the earliest example of landscape sculpture in history.

Since the 20th century, modern sculpture has been influenced by various modern artistic trends such as abstractionism, constructivism, postmodernism, etc. It has undergone significant changes in its expression techniques, spatial form, functional role, material selection, etc. It is no longer merely the decoration and ornament of the environment, but has become a form that expresses creative ideas, pursues the sense of expansion and fluidity of space, can be viewed and participated by people from various aspects and angles, and has a certain leisure or entertainment function. It is itself a brand-new "landscape" [8]. Another thing that deserves our most attention is the giant iconic garden sculpture landscapes that have appeared in various historical periods in various countries around the world. These giant sculpture landscapes have a very significant impact on the construction of garden art. Due to the large scale of this type of sculpture, it must be integrated with the building in terms of construction methods and difficult to separate from each other [9]. Taking the outdoor site as the object of sculpture, and the garden landscape as the sculpture of space, all these two arts have a tendency to merge, which indicates the emergence of landscape sculpture. In our country, although the history of landscape sculpture is not long, with the rapid development of economic landscape, the acceleration of landscape modernization, the improvement of people's aesthetic level and the requirement of environmental quality, landscape sculpture is more and more popular and recognized by people. Landscape sculpture has received unprecedented attention from all walks of life.

2.2 Development status and problems in the era of big data
Landscape sculpture, as an art to beautify the environment, has been widely used in the public environment of city landscape city and has become a series of beautiful scenery in the landscape. Art has
no past or future. Art does not exist in advance or backward, but art does exist in superficiality and profundity. Although China's city landscape sculpture industry has made some achievements, but at the same time there are still some shortcomings and deficiencies. The main problems are: the development across the country is very uneven, there are some landscapes and some landscapes have not realized the role of landscape sculptures; some sculptures are similar, monotonous landscape forms, low artistic content, or have no relationship with specific environments or do not associate with the landscape. The spatiotemporal big data refers to data sets with spatio-temporal properties that cannot be acquired, managed, processed, and analyzed by landscape conventional software tools within a certain period of time. The spatiotemporal big data cannot be separated from the landscape without the technical support of big data, involving the collection, cleaning, landscape management, mining and other important links of big data, aiming to obtain valuable information quickly from various types of big data. Landscape sculpture planning and design big data landscape must cover spatial geographic data and historical and cultural data, including not only natural geographic data such as quality, landform, soil, hydrology, vegetation and atmosphere, but also human historical data such as population, history, culture, architecture, road and community. Landscape sculpture planning and design big data belongs to the category of spatiotemporal landscape big data. It not only has the basic characteristics of big data, but also has important spatial and temporal characteristics of the landscape. It is the important data source and quantitative scientific basis for digital landscape planning and design. The objectivity of data means that the data is a true reflection of objective things or phenomena without artificial interference or processing. It is the objective basis for understanding the landscape planning landscape design site and formulating a landscape planning and design plan. These data are a comprehensive reflection of the spatial landscape form, material composition, physical characteristics and chemical properties of various target objects of the landscape planning and design site. The landscape is not interfered by any human factors and has a good objectivity. The multi-source intuitionistic data refers to the diversity of data sources. In terms of landscape, what should be explained in essence is the diversity of landscape of big data types of landscape sculpture, which can be obtained from table 1.

### Table 1 General classification analysis of big data of landscape sculpture

| Major categories                          | Type               | Subclass                                                                 |
|------------------------------------------|--------------------|--------------------------------------------------------------------------|
| Spatial data (direct positioning)        | Basic spatial data | Digital map data, remote sensing image data, three-dimensional model data, etc. |
|                                          | Dynamic monitoring data | Environmental monitoring data, video monitoring data, system access data, etc. |
|                                          | Location communication data | Location data, call data, SMS data, etc.                             |
|                                          | Network media data   | Network query, network consumption, network comments, network photos, etc. |
|                                          | Credit card consumption data | Traffic card data, shopping card data, bank card data, etc. |
|                                          | Social network data  | Microblog data, check-in data, comment data, WeChat data, etc.          |
| Attribute data (indirect positioning)    | Site resource data  | Natural resources data, human resources data, resource management data, etc. |
|                                          | Site facilities data | Traffic facilities data, recreational facilities data, other service facilities data, etc. |
|                                          | Socio-economic data  | Community data, population data, economic data, etc.                    |
2.3 Research on the Causes of Landscape Sculpture Problems and Big Data

At present, people engaged in landscape sculpture construction in the whole country are mixed up with good and evil people. Some stone carving landscape folk artists have also entered the landscape sculpture field. Because they have not received any special landscape training, they lack basic understanding of landscape sculpture and lack knowledge of artistic creation laws. Although they are good at carving on traditional themes, their fatal disadvantage is that they cannot create landscapes. Sculpture landscape is an important element of landscape art. Excellent landscape sculpture works should be in perfect harmony with the surrounding natural environment and echo the landscape from afar. This landscape cannot be separated from the overall planning of sculpture and the surrounding environment. However, landscape sculpture construction is not included in the overall planning and regulatory detailed planning of our city landscape city. Some leaders of decision-making departments are keen on image construction, lack of landscape art cultivation and have no appreciation for the quality of sculpture. They decide the landscape only by their own preference. Their temporary clapping may negate the collective landscape opinions of many experts and masses. The dynamic of data mainly focuses on the real-time acquisition, processing, landscape analysis and application of data, and further provides decision support. On the basis of dynamic data acquisition, further data processing and analysis of landscape synchronization and landscape policy application combined with planning and design requirements are the key to the dynamic of landscape sculpture big data. The current situation of the data refers to that the data can reflect the latest natural and human environment landscape conditions, facilities and population distribution of the landscape planning and design site at any time, which is closely related to the access and rapid change of the data. Mobile communication devices and means have been quite popular, and become an organic part of the life style of landscape residents. By using the geographic location data of mobile communication base stations and mobile phone landscape data, the nuclear density analysis method is used to generate mobile phone user density maps at different times during workdays and holidays, to further identify the grades and types of landscape functions in landscape city public centers, and identify employment, The landscape degree of the recreational and residential function areas and their mixed processes are of auxiliary decision-making significance for the refined landscape planning and design. The specific research content and status statistics of various types of big data at home and abroad in the field of landscape architecture and urban research are shown in Table 2.

Table 2 Application Status of Big Data in Urban Research and Landscape Architecture

| Research areas                                      | Data type  | Research content                                      | Research type       |
|----------------------------------------------------|------------|------------------------------------------------------|---------------------|
| Application of Big Data in Landscape Architecture  | Bus card swiping data | Greenway Planning Based on Big Data of Bus Card swipe | Greenway research   |
|                                                    | Climate data | Visual Evaluation of Data on Climate Change Policies and Decisions | Urban thermal environment |
| Application of Big Data in Urban Research          | POI data    | Identification of Urban Landscape by Nuclear Density Method | Functional area identification |
|                                                    | Location data | Landscape Prediction Based on Location Information | Landscape identification |
3. Development Trend of Modern Urban Landscape Sculpture

3.1 The Formation of Fusion Trend of Modern Sculpture and Modern Landscape Architecture

The landscape was created with the development of modern sculpture and some aspects of modern garden design itself. Respecting the site, adapting to local conditions, and seeking to have a close connection with the site and the surrounding environment to form an overall design concept have become the basic principles of modern garden landscape design. The role of landscape architects is not to deliberately innovate. Landscape is more to discover. It is to observe and understand the original characteristics of the field landscape with professional eyes, discover its positive aspects and guide them. The development of sculpture in different historical periods will be influenced and acted by the factors of politics, landscape economy, culture, environment, etc. at that time, and it also indirectly reflects the basic features of the landscape society. However, the use of big data is not enough, including the access to big data is still limited. Many landscape spatiotemporal big data are stored in business or enterprise servers. For landscape planning and design practitioners, there is no real spatiotemporal big data landscape data can be applied at any time. The processing ability of big data is still limited, most landscape planning practitioners have not reached the expected level of landscape skills for big data analysis and application, so they can not try to apply big data in their own landscape planning and design research. Landscape sculpture moves towards and is close to the life of ordinary people, serving the public and becoming an important part of the city's daily environment. The planning and construction of sculpture should be fully combined with the local historical and cultural background, reflect the local tradition and style, and be designed for specific environment and culture. Through sculpture, people can be inspired to think about history and reality, so that the natural environment forms an integral part of the work and sculpture becomes a harmonious part of the environment. The use of new materials has also created sculptures in different spaces that have different artistic effects than previous traditional materials, and promoted the development of new sculpture art expressions. Art such as soft sculpture, dynamic sculpture, light sculpture, and sound sculpture have appeared. The form greatly broadens people's horizons and makes people's thinking and imagination touch areas that have not been touched by predecessors.

3.2 Future big data development trends

In recent years, with the increasing calls for global protection of the ecological environment, landscape architects have gradually begun to pay attention to the application of ecological concepts in landscape design. Ecological principles require landscape gardeners to respect nature, take nature as their teacher, and study the evolution law of nature. It is necessary to conform to the nature, reduce blind artificial transformation of the environment, and reduce the maintenance and management costs of landscape. With the development of science and technology and the change of ideas, anti-traditional four-dimensional sculpture, five-dimensional sculpture, acousto-optic art, dynamic sculpture, soft sculpture, interactive sculpture and so on have appeared in modern art. This is due to the emergence of Einstein's theory of relativity, which has changed people's concept of time and space, enabling modern artists to stand on a higher level to understand the world and express the world, break through the traditional three-dimensional static form, and explore multidimensional space and time. These explorations are also reflected in landscape architecture sculpture. The ecological environment of big data application is gradually constructed. Create a new model of social governance with precise governance and multi-party cooperation, establish a new mechanism of stable, safe and efficient economic operation, build a new system of people-oriented and benefiting people's livelihood services, open a new pattern of innovation driven by mass entrepreneurship and innovation, and foster a new ecology of high-end intelligence, emerging and prosperous industrial development. It can be expected that the bottleneck of big data acquisition mentioned above will be gradually broken. The technology system for big data application has gradually taken shape and the applied talents have gradually grown in strength. Multi-source integration and innovation development of big data application: relying solely on a certain type of big data may only explain or depict a certain aspect or dimension of landscape...
planning and design; With the construction of big data application ecological environment and application system, as well as the cultivation of professional talents, the integration and application of various types of spatio-temporal big data is an important development trend. The planning and design of urban landscape sculpture are all based on respecting the laws of nature and society and meeting the needs of people's production, life, leisure, recreation and entertainment, and should embody the people-oriented concept. Therefore, landscape planning and design based on spatio-temporal big data must always reflect the characteristics of humanism. Through the analysis of big data, we can quantitatively describe the multi-dimensional characteristics of humans such as nature, society, culture and emotion., Environment and other dimensions to meet the multi-dimensional characteristics of people.

4. Summary
The language of sculpture is its own form, which in turn shows the concrete content of sculpture. Sculpture language has been refined for thousands of years and has developed to today. It expresses various forms of the world in its unique form and expresses the complex and profound thoughts and feelings of human beings. This kind of emotional expression has a special way. With the development of landscape sculpture, it is more necessary to study its modeling language, artistic character, expression mode, its position in the landscape and the historical and cultural values it contains, so as to alert sculpture creation from the perspective of humanity, history, geography and culture. With the development of society and economy, people's demand for spiritual space will become greater and greater. In modern society, diversified cultural development will lead landscape sculpture towards diversity, interest and more uncertainty. With the development of data mining and analysis technology, we have entered the era of intelligence based on big data. The application of big data has gradually penetrated into people's daily lives. Big data provides a good platform for teaching model innovation, and resource sharing brought by informatization makes it possible for a new model of teaching practice based on human standards. It can be said that the combination of the Internet of Things technology in the era of big data and the landscape development of creative parks is irreversible.

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References
[1] Xue Tao, & Dai Linlin (2016). Spatial characteristics and influencing factors of urban activities from the perspective of big data: a case study of six districts of Beijing. Urban issues (4), 25-30
[2] Zhu Jie, & Fu Kangli (2016). Thinking about the new urbanization construction of Suqian with big data thinking. China Science and technology information (9), 114-115
[3] Xue Tao, & Dai Linlin. (2015). An empirical analysis of the spatial relationship between urban resident network sign in activities and economic service industry based on big data. Business economy research (24), 136-137
[4] Liu Song. (2015). Origin, development and response of digital landscape. Landscape architecture (10), 12-15
[5] Cao San Sheng, Li Lu. (2016). An overview of the innovation trend of the movie industry in the era of Internet +. Media (4), 16-18.
[6] Liu Na, Yu Guangsheng, & Mao Saoqi. (2016). Trend measurement of economic management research based on network data. China Soft Science (4), 133-142
[7] Ding Meichen (2019). Research on digital planning mode of urban landscape -- Taking Zhangzhou urban landscape planning as an example. Fujian architecture (5), 15-19
[8] Cheng Zhuqing (2014). Cultural construction of commercial space landscape in the era of big data. Shanghai business (5), 56-59
[9] Fang Shenghao (2017). On the current situation and development of urban landscape sculpture. Shenzhou (20), 30-30
[10] Ma Liang, & Wang Jia (2015). From passive to active: an analysis of the development and Prospect of sculpture in Chinese landscape. Theatre house (17), 158-159