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The Balance between Artistry and Science in Landscape Design of Memorial Garden Based on the Prediction Model of Multimedia Visual Perception Quality

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Abstract: - The importance of careful planning and design of the memorial garden's landscape has been steadily rising in recent years as people have grown more aware of the garden's surroundings. The analysis is carried out from two perspectives of the artistic and scientific balance of the memorial garden landscape in this paper, explaining the effect of the balance between artistry and science in landscape design, while illustrating the effect of artistic and scientific balance based on some real memorial garden landscapes. This analysis and explanation play a pivotal role in the landscape design of the memorial garden. The pervasiveness of multimedia programmes and the recognition of their value in enriching life go hand in hand. Researchers need to pay close attention to the spread of multimedia apps that improve such encounters.

Keywords: Landscape Garden; Landscape Assessment; sustainable buildings; Visual Landscape Memorial Garden, Landscape Visual Control Space Interface

Introduction

The memorial landscape is designed mainly based on the urban design plan layout plan, and the design style can reflect the designer's values and his own taste for environmental art [1-2]. The excellent landscape design of the memorial garden can show the designer's love and pursuit of nature, and it can also reflect the civilization and taste of a city from the side [3-4]. The landscape planning and design reflected in the memorial garden and science and art mainly followed the values of scienndscape designers. The landscape of the memorial garden can show the display form of important events and affairs landscape in terms of time dimension. The performance of complete commemorative significance is closely related to the physical form of the memorial garden landscape itself, which mainly includes physical objects with physical features such as buildings and greening environment.

According to the commemorative significance and physical form embodied by this material form artistic value makes people feel valuable toward material forms and artistic expressions. The balance between artistry and science is the objective beauty of craftsmanship created by mankind in practice, and memorial garden landscape is also the product of people's practice. It is the crystallization of regularity and purposiveness in the process of human material production. In the landscape design of the memorial garden, the monumentality of the landscape is mainly expressed by balancing the artistic and scientific materials, functions, art, time and space and other factors.

The balance between artistry and science makes the aesthetic way embodied in the comprehensive artistic beauty of quiet observation and operational experience. Based on the analysis of applied theory, a preliminary comparative study on the time and space of the landscape of the east and west memorial gardens is carried out. This thesis is an important supplement to the basic theoretical research of memorial landscape, and fills the gap in the research field of multimedia visual perception of memorial landscape.

Key contributions

- The study emphasizes both the artistic rules are diversity, coordination, balance, and rhythm and the need of a guiding philosophy, scientific planning substance, and methodology.
- The research uses multimedia visual perception to classify memorial garden visually dominating spatial interactions, providing landscape design insights.
- The article also examines many multimedia visual perception quality prediction difficulties and recommends that AI and ML improve prediction models to account for subjective human experiences and cultural variation.

Related work

The study [16] proposed deep learning (DL)-based JND and perceptual quality prediction models to predict SUR and VWJND of compressed videos with varied resolutions and coding settings. The purpose of predicting SUR, regression models using DL technologies was used. After that, the Video Wise Spatial SUR approach, also known as VW-SSUR, is recommended for predicting the SUR value of compressed video based on spatial distortion. Third, they suggest a method known as Video Wise Spatial-Temporal SUR (VW-STSUR), which incorporates both spatial and temporal information in order to improve the accuracy of SUR prediction. The research [17] developed a novel audio-visual attention dataset for ODV using mute, mono, and ambisonics

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sound formats. The behavior of users, including visual attention correlating to sound source locations, viewing navigation congruence between observers, and fixation distributions in these three audio modalities, was researched based on video and audio information. The article [18] provided Opinion-unaware blind image quality assessment (OU BIQA) a new technique. In their suggested technique, they study natural scene statistics (NSS) and human brain visual perception features. Quality-aware NSS and perceptual characteristics-related features are used to characterize image quality. To assess image quality, they train a pristine multivariate Gaussian (MVG) model on a set of pristine images. The difference between a fresh image's MVG model and the learnt pristine MVG model determines its quality. The paper [19] proposed a nonintrusive medical QoE prediction model for small cell networks that considers QoS, content, and devices. Their prediction approach uses an MLP neural network to predict m-QoE. The platform maintains and optimizes diagnostic quality via a device-aware adaptive video streaming method. The model uses an unobserved dataset of input factors, including QoS, content properties, and display device parameters, to provide an output value of m-QoE. The article [20] provided a technique for evaluating the perceptual quality of screen content images (SCIs) that is effective and blind. The approach was named the perceptual quality measure by spatial continuity (PQSC). The proposed technique utilizes the center-surround mechanism found in the human visual system (HVS) to extract the statistical features on chromatic and textural variations in SCIs to quantify visual distortion. These characteristics are found in variations.

The Scientific Manifestation in the Landscape Planning and Design of the Memorial Garden

Correct Guiding Ideology

The memorial garden landscape planning is designed based on a certain idea, which runs through the entire process of the memorial garden landscape. Through the establishment of the thought, the design direction of the memorial garden landscape is grasped, integrating the design concept into all aspects of the plan, and the guiding ideology is the central point of the plan design [5-6]. As long as the guiding ideology is mastered, the memorial garden landscape works that meet people's needs can be designed.

Scientific Planning Content

The composition of the contemporary memorial garden's landscape design plan is becoming ever more difficult to understand. This is related to improvement of people's aesthetics. People work, live and reside in cities, so they need to carry out various activities. The design of attention shall be paid to the role. The memorial garden landscape design not only satisfies the quadratic element, but the capacity of the three-dimensional and stereoscopic display environment space also meets the needs of people's activities. Only when the spatial structure is fully considered, the landscape works can meet the design requirements. A scientific and reasonable space structure lies in the multiple conditions of functional integrity, efficiency, sanitation, resource conservation, environmental comfort, clear standards and appropriateness, orderliness, etc[7-8]. The unified coordination of the artificial environment and the natural environment shall be taken into account to ensure the coordination between man and nature during the design. The final afforestation needs to be considered for landscape design of the memorial garden, so the green space structure is a very important part, mainly the conditions of land use, functional configuration, road traffic system, including green space system, etc., all exist in an organic whole, any part can't be separated from the whole structure. By mastering the overall function and structure, people of age and preferences are different.

Scientific Planning Method

In all of the scientific inquiries and studies that are carried out, the fundamental principles that underpin domestic and international memorial garden landscape designs are always adhered to. This is mostly dependent on the social scientific aspect together with the discipline of memorial garden landscape design. The public opinion is understood by conducting a reasonable inquiry and research of the landscape design of the scientific memorial garden. This allows for the planning of different building methods. Additionally, the situation at the site itself is studied, and this information is combined with the data acquired from many aspects. It is possible to achieve a more scientific approach to the design of the memorial garden's landscape by doing research on the humanities and the natural environment of the surrounding area. This will help to illustrate the connection between the past and the future. Because the landscape of the memorial garden is a complex system project, it requires scientific and reasonable planning and design, constant analysis of the various stages of the intervention of each system, clarification of the theme, and a firm grasp of the primary contradictions through in-depth research of the issues that need to be investigated and solved while looking down at the adversary from a height. The proper strategic deployment has been given, which allows the creation of the landscape plan for the memorial garden to go in the right direction. The comparative technique and the positive method need to be considered in order to arrive at a conclusion about the plan that will be used to memorialize the design plan of the landscape that will be implemented in the garden. If interested in being creative and coming up with new ideas, you will find that arguments will play a significant part in the future via the use of your imagination.

Artistic and Scientific Nature of the Landscape Planning and Design of the Memorial Garden
The Art of Landscape Planning and Design of the Memorial Garden
The memorial garden landscape planning should be designed not only to reflect the scientific nature, but also pay attention to the artistry, and certain artistic rules must be followed during the design. To begin, the connection that exists between uniqueness and cohesiveness [9-10]. All of the above materials are taken into consideration when designing the landscape of the memorial garden, when designing the build, size, color, line, form, style, and other elements, and this is performed so that they can be unified and coordinated to form a certain degree of similarity or consistency that makes people feel as though there is a certain change in the unity. Specifically, this is performed so that the people who visit the memorial garden will feel as though there is a certain change in. Diversity means that when designing the landscape of the memorial garden, when designing the build, size, color, line, form, and other element if the concept of each component in the design is not sufficient, then it indicates that there will be a modification. It gives them the impression that their lives are disordered and unorganized at the moment. Second, have an understanding of the connection that exists between coordination and comparison. The objects of different forms are formed as a unified whole through grasping and innovating the shape, color, line, proportion, deficiency and excess, ray, etc. for the landscape design of the memorial garden to achieve the goal of harmony. It's related to different sceneries. Thirdly, the relationship between balance and stability. The memorial garden landscape is being designed, and the issue of color needs to be considered. If the color is dense, it will be messy. The question of quantity is another important one to think about. If it's too huge, there won't be enough time to arrange anything. Only when plants of varying weights are suitably organized and adhere to the idea of balance can it become stable. Comfortable feeling. Fourthly, the relationship between rhythms. The rhythm and cadence of the environment is expressed by the form, color, and texture of the plants in the landscape. In order for willow trees to have the desired impact on the environment, they need to be meticulously cultivated and in harmony with one another, taking into mind the atmosphere and the sense of routine. The feeling of rhythm and cadence is heightened by the plants being organized in alternating patterns..

It is required that the paving of the memorial garden landscape be harmonized with that of the unreasonable area. This will ensure that each section is more legible, that the environment is accented with form and pattern, and that the thickness of the memorial garden landscape is enhanced. There are numerous decorations that are centered on neutral tones, and the colors are bright without being vulgar; however, in general, the luxurious colors should be coordinated with the atmosphere of the memorial garden landscape space, and the sense of sight should be used to enhance the sense of direction and openness of the space.

The memorial garden landscape sketch is the decoration that is done after the construction of the memorial garden landscape is finished. This decoration is done to meet the people's physical and psychological requirements through the embellishment of the flower beds, lighting fixtures, flower stands, chairs, rocks, vegetation, flower pots, springs, and sculpture. The memorial garden landscape drawings divide the related area from the space itself, so ensuring that each picturesque point has an identifiable marker. The drawing exaggerates the surrounding environment that may be seen when walking through the memorial garden. An original creative design may be gleaned from the way the memorial landscape looks and feels in its whole. Imaginings of desire, exploration, and other creative concepts.

The Scientific Nature of Landscape Planning and Design of the Memorial Garden
The memorial garden landscape planning is designed with a certain idea, which runs through the entire process of the memorial garden landscape. Through the establishment of the thought, the design direction of the memorial garden landscape is grasped, integrating the design concept into all aspects of the plan, with the guiding ideology as the central point of the plan design. As long as the guiding ideology is grasped, the memorial garden landscape works that meet people's needs can be schemed out. The modern memorial garden landscape design plan includes more and more complicated content. This is related to improvement of people's aesthetics. Life and residence are two factors that produce a variety of activities. In the design, it is necessary to take into consideration both the activities of the people and the education of the function. In order to accommodate the requirements of people's activities for the planning of the landscape of the memorial garden, the quadratic element, three-dimensional and stereoscopic display environment space capacity is necessary.

The basic principles of domestic and foreign memorial garden landscape plans are all the time followed for the scientific and detailed investigations and studies. This mainly depends on the social science nature accompanied with the memorial garden landscape planning discipline. Through reasonable investigation and study of the landscape plan of the scientific memorial garden, various construction procedures are planned, and the situation on the spot is investigated combining with the data collected from various aspects, to understand the public opinion. It is feasible to achieve a more scientific approach to the layout of the memorial garden by doing research on the local humanities and natural environment. This will allow one to better appreciate the connection between the past and the future. Because the landscape of the memorial garden is a complex system project, it requires scientific and reasonable planning and design, constant analysis of the various stages of the intervention of each system, clarification of the theme, grasping the main contradictions through comprehensive

research of the problems to be investigated and solved, and looking down at the enemy from a height. The proper strategic deployment is provided, which causes the design of the landscape plan for the memorial garden to evolve in the right direction. It is necessary to reach a conclusion about the plan for the garden's landscape design based on the comparison technique and the positive method [11-12]. This will allow for the design plan of the garden's landscape to be commemorated. Argumentation will play an essential function in the future if creativity and new ideas are desired to be found via the use of future imagination.

Prediction Model of Multimedia Visual Perception Quality

The sole assumption necessary for the study of visual landscape to have any practical value is the concept of landscape space [13-15]. The typical observation range for anything as far away as the human eye is 60 on the principles of mental impairment. This is according to the viewpoint. The corn that is created by the angle of view, as well as the visual information that is received via this bread, are both stable from an intuitive standpoint. There is a merging of the landscape's material realm and its visual space. Is the spatial visual interface of single matter equal to the physical spatial interface. This mainly depends on the relationship between the aspect ratio of the boundary of the outdoor space and the perspective and line of sight of people.

A directed acyclic graph is used to depict the probability dependency of variables in the context of the prediction of the quality of visual perception in multimedia. A collection of conditionally independent hypotheses is represented by the multimedia visual perception quality prediction that is built of sample learning. Any end point is the combined condition of the parents separately rather than the end point of the children. The quality of multimedia visual perception can predict the probability distribution of the random vector of each node and decompose it into the product of the marginal distribution of random variables, namely in formula(1),

$$P\left(x_1, x_2, \cdots, x_m \mid B\right) = \prod_{i=1}^{N} P\left(x_j \mid \pi_j\right) = \frac{\sum_{A-(x_i)\cup \pi_i} P\left(x_1, x_2, \cdots, x_m\right)}{\sum_{Ax_j} P\left(x_1, x_2, \cdots, x_m\right)} \qquad (1)$$

In the formula：Where: $x_1, x_2, \cdots, x_m$ - attribute node, $A = \{x_1, \cdots, x_m\}$ - attribute set, $\pi_i : i = 1, 2, \cdots, m$ represents the parent node set of node x_i.

Estimating the possibility of producing results based on the occurrence of events is the most important part of the prediction of the multimedia visual perception quality. The statistical knowledge of the multimedia visual perception quality prediction is used in order to calculate the probability of the event corresponding to the relevant node. This information is supported by the parameters (probability distribution) of the multimedia visual perception quality prediction. The probability of the event corresponding to the relevant node is then computed. To put it another way, the problem is that the value h of one part of the attribute set H of the attribute set A is known, while the attribute set K of the other portion of the attribute set A is the conditional probability P of the stated value k. To put it yet another way, the issue is that the value h of one part of the attribute set H of the attribute set A is known. (K=kH=h) To put it another way, the problem is that the attribute set K of the other portion of the attribute set A is the chance that the provided value k will occur. It is feasible to find the most likely consequence or cause by comparing the magnitude of the probabilities P(K=k|H=h) associated with the different nodes in the prediction of the quality of the visual perception of multimedia content.

Multimedia visual perception quality prediction is to obtain the event hypothesis under known conditions mainly based on the maximum posterior probability H is the limited hypothesis space defined in the exemplary space D. For each hypothesis h (that is, each multimedia visual perception quality prediction), It is feasible to provide an expression in D for the post probability of the network, which goes as follows:

$$P\left(h \mid D\right) = \frac{P\left(D \mid h\right) P\left(h\right)}{P\left(D\right)} \qquad (2)$$

The prediction of multimedia visual perception quality is to achieve

$$h_{MAP} = \arg \max_{h \in H} P\left(h \mid D\right) \qquad (3)$$

The minimum description length L(g, D) is a measurement to describe the structure information of multimedia The minimal description length, abbreviated as L(g, D), is a measurement that may be used to define the structural information of the multimedia visual perception quality prediction store. G represents all of the alternative structure spaces of the Bayesian network, one of which is the minimal description length L of the network structure g based on the data set D. Another one of these structure spaces represents the Bayesian network itself. D. $g \subset G$ (g, D) is used to define.

Single factor analysis is carried out at first, and then multi-factor synthesis is carried out, quantitative analysis and qualitative analysis are effectively combined taking the multimedia visual perception rules of commemorative garden scenery as the research object, and statistics and numerical calculation as the main

research methods in this paper. Statistically, 150 examples of memorial garden landscapes were selected to constitute a statistical sample based on the multimedia visual perception of the overall construction of the memorial garden landscape. Research on the classification of multimedia visual perception factors. The research carried out from six aspects is conducted for the analysis of the quantitative relationship between the axial line and the plan plane. Comparative analysis of landscape spatial sequence and tourist routes; Cone analysis based on landscape nodes. Analysis of idle line in landscape sections; analysis of the high-proportion relationship between the length and width of landscape sight corridors; statistical analysis of matrices, rows and columns, and extraordinary-scale landscape elements.

Examples and Results Analysis

Statistical Sample

The network electronic map serves as the major source of technical support in the selection of the memorial garden's landscape; in addition, the construction process is well-known and takes a considerable amount of time to complete. In a statistical sample is comprised of a total of 150 contemporary memorial garden landscapes that have been honored with prizes from professional organizations. The classification standard is based on the formation mechanism of landscape monumentality proposed by Liu Binyi and Li Kairan. Active first-loaded memorial garden landscape (like a tomb); passively first-loaded memorial garden landscape (former residence residences of celebrities, cultural relics, etc.); consciously re-transported memorial garden landscape (monuments, memorial gardens, etc.); passive re-transported memorial garden (the memorial composition is suitable for the architectural form. For example, the central axis, the symmetry, the classical composition, the monumentality of the concentrated composition, etc. In the sample 150 landscape examples, there are 27 active initial load type memorial garden landscapes, which occupies 18% of the total. There are 11 memorial garden landscapes that were loaded in the background initially, accounting for 7% of the total. There are 112 examples of active and passive refilling memorial landscapes, which represent for 75% of the total.

Preliminary Description of Statistical Data and Classification of Visually Dominant Spatial Interfaces

According to the preliminary description of the statistical sample, an example of 48% of the sample includes a clear axis relationship and sight corridor. In 56% of cases, the super-normal logo is the visual subject and the commemorative subject. In 38% of the cases, there is a clear spatial sequence sum; in 87% of the nodal path space system, there is a visually dominant space and a clear visually dominant spatial interface (Figure 1). Based on the multimedia visual perception of space interface dominated by vision, the landscape of the memorial garden is divided into two types. That is to say, the spatial interface dominated by multimedia vision and the spatial interface dominated by cemetery-style vision.
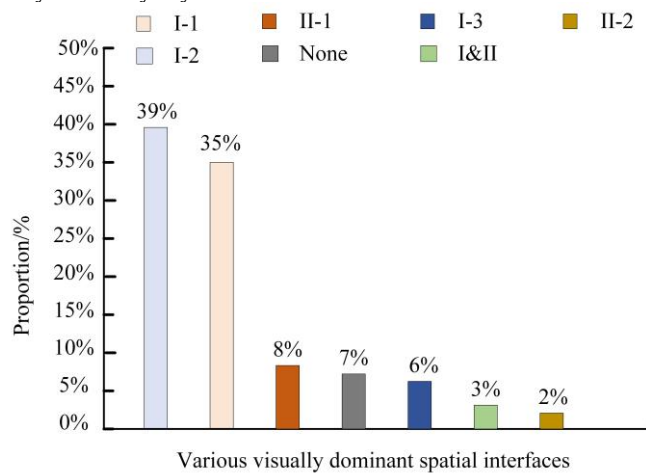

Figure 1: The percentage of different types of visually prominent spatial interfaces found in the sample population

The pyramid serves as the basis for the prototype of the spatial interface that is controlled visually by multimedia. The primary visual information is centered at the level of the viewer's field of vision, and the visual emphasis displays a consistent triangle composition. For example, the Brandenburg Gate in Germany, the Sam Houston Monument in Harman Park in Houston, and the Monument to the Nanjing·Yuhuatai Cemetery of Revolutionary Martyrs in Nanjing, etc. belong to the multimedia vision-led spatial interface. The visually dominating spatial interface categorization shown in Figure 1 is used to count a total of 150 instances of statistical samples. Among these, the memorial garden landscape with multimedia visual dominating spatial interface accounts for 88%, which is an absolute particular gravity in this manner, having a clear memorial topic is often a method of memorial landscape design.

Firstly, the series control the landscape by means of axial line. The axial line also functions as both a sight channel and the main sightseeing route. Due to restrictions on sightseeing routes and sight corridors, tourists' concerns are focused on the main body of the memorial. The main part of the memorial is mostly extraordinary

buildings, which are prominent signs and visual focal points in the landscape environment. The pyramid-like stable composition is displayed through the sight corridor and the symbolic commemorative main visual-led spatial interface, giving a strong visual and psychological impact, and conveying the monumentality of the landscape. This design method is often used in memorial places centered on a single monument, such as celebrity memorial gardens and important historical event memorial gardens.

Secondly, a matrix is formed through the repetition of a single landscape element. This design has not clarified the restrictions on sightseeing routes and sight corridors. Visitors can take a walk in the site. Each footprint is similar to a spatial interface governed by vision. The repetition of the various pictures left a deep impression on the visitors. Created a memorial atmosphere of the landscape. This design method is often applied to collective historical events. The landscape elements commemorate the victims respectively.

Sub-sample Data Statistics

There are 55 instances in the statistical sample when the landscape sight corridor and the multimedia visual-dominant spatial interface are merged into a single location. A secondary statistical sample is comprised of twenty-five instances that were selected at random. The data of each visual factor is extracted, and a statistical description is carried out from the following aspects through numerical calculation. The number of landscape nodes and the proportional relationship of each axis are counted to commemorate the position of the main body on the axis. Analysis of the quantitative relationship between the axial line and the plan plane; part (Figure 2~4).
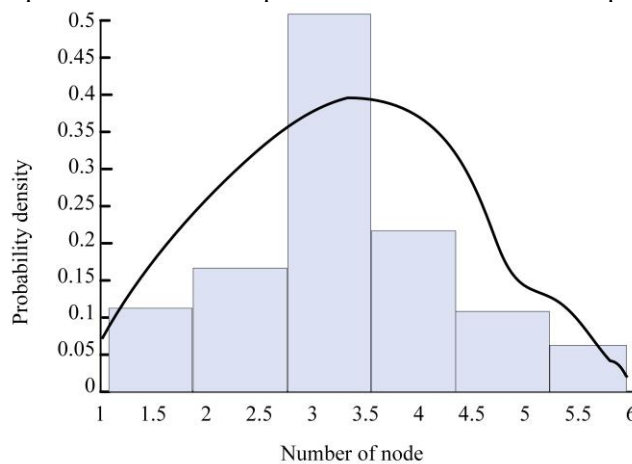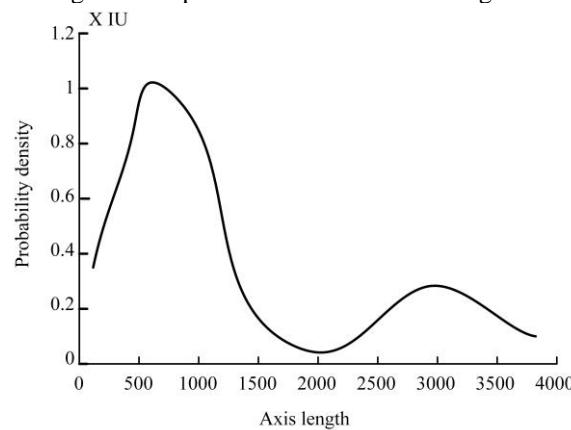

Figure 2: Expected node distribution diagram.

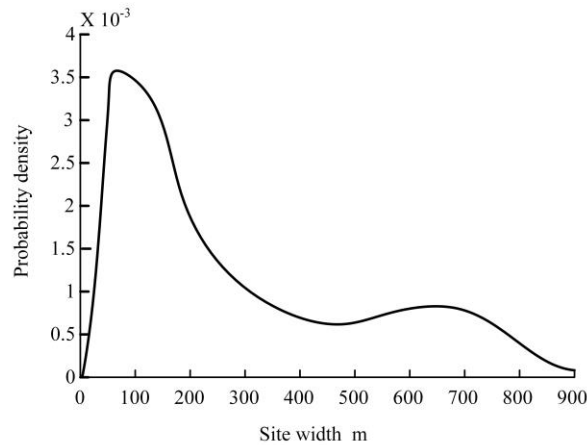Figure 3: Density plot of axis length.
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Figure 4: Site-width probability density histogram.

Therefore, it is concluded that in table (1):

Table 1: Data Statistics

• The landscape node count follows a normal distribution, with more nodes concentrated in the centre and fewer at the extremes. There are typically about four nodes.
• The length of the axis has the characteristics of two peak distributions, which are respectively close to 680m and 4800m, and the former is more.
• The width of the site is concentrated within about 340 meters. The data concentration within 120 meters is particularly significant, which is almost the same as the scale of city square.

Conclusions

Multimodal visual perception allows for a more precise categorization of the memorial garden's scenery. Taking the visually dominant spatial interface type as an example, science and art have always been associated, and they have always been unified and coordinated in the landscape design and planning of the memorial garden. The scientific nature reflects the reality while the artistry shows the taste. Therefore, the landscape planning and design of the memorial garden is first of all scientific, and then artistic, that is, to be usable, easy to use, and durable while being observable, beautiful and durable. The subjective nature of human experience and cultural diversity provide challenges for the multimedia visual perception quality prediction model. Prediction models might be strengthened by advancements in AI and ML, leading to a better grasp of visual preferences in different contexts and more cultural relevance.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest

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