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Research Article

Research on an Aging-Friendly Design of Urban Park Landscape Based on Computer Virtual Simulation Technology

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Influenced by economic development and the information society, more elderly people are more willing to go to urban parks for activities. Among them, comprehensive parks are the first choice for most elderly people. However, most urban parks are currently constructed according to adult. There are very few researches and practices on the age-appropriate design of urban parks, and the richness, safety, and comfort of the elderly's activities cannot be guaranteed. In view of this situation, this paper studies the aging-appropriate design of urban comprehensive parks and proposes an aging-friendly design scheme for urban park landscapes based on computer virtual simulation technology from the four aspects of layout, type, distribution, and construction, systematically researched the activity space system for the elderly, and realized the virtual simulation display effect of urban park landscape. Research shows that the design scheme proposed in this paper solves the problem of interaction between buildings and users, breaks the traditional landscape design presentation form, and saves the cost of modification and production of traditional models, which is suitable for the aging and popularization of future urban park projects, providing an effective reference.

1. Introduction

At the same time, this phenomenon is also called the decline of population growth and total life expectancy due to aging. According to the latest data from the National Bureau of Statistics, the number of people aged 60 and over in China is about 240 million, accounting for 17.3% of the total population [1]. Among them, the population aged 65 and above is about 150 million, accounting for 11.4% of the total population. According to the division standard determined by the United Nations "population aging and its economic and social implications," when the population over 60 years old exceeds 10% of the total population, or the population over 65 years old exceeds 7% of the total population, the country or region is already in an aging society. Over the past 10 years, the proportion of China's elderly population has continued to rise, with a year-on-year growth rate of 5.5% in 2017 from 3.0% in 2008 (see Figure 1). This means that China is accelerating into an aging society, and the development of the pension industry is imminent as shown in Figure 2.

As an important part of urban texture, urban public space has always been the core of the overall urban environment and the material space entity that accommodates people and their activities [2]. However, the vast majority of urban parks lack the relevant consideration of the health needs of the elderly in the design and construction. At present, only a few green landscapes such as Beijing Wanshou Park, Beijing Ditan Traditional Chinese Medicine Health Culture Park, and Shanghai Lujiazui residential area are built in China to make targeted landscapes for the health needs of the elderly, such as 219 Park, People's Park Mengtai Park, and other large-scale urban comprehensive parks that do not give relevant consideration to the health needs of the elderly, resulting in many inconveniences and potential safety hazards for the elderly in park activities. As the main

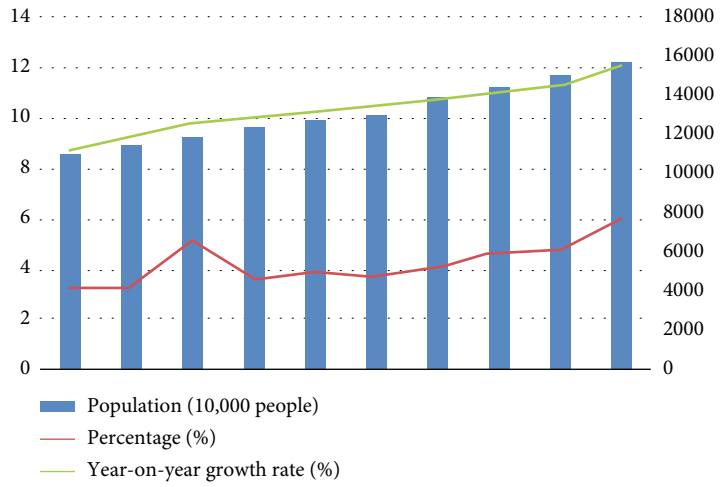

Figure 1: Growth rate of elderly people over 65 years old in China, 2010-2019.

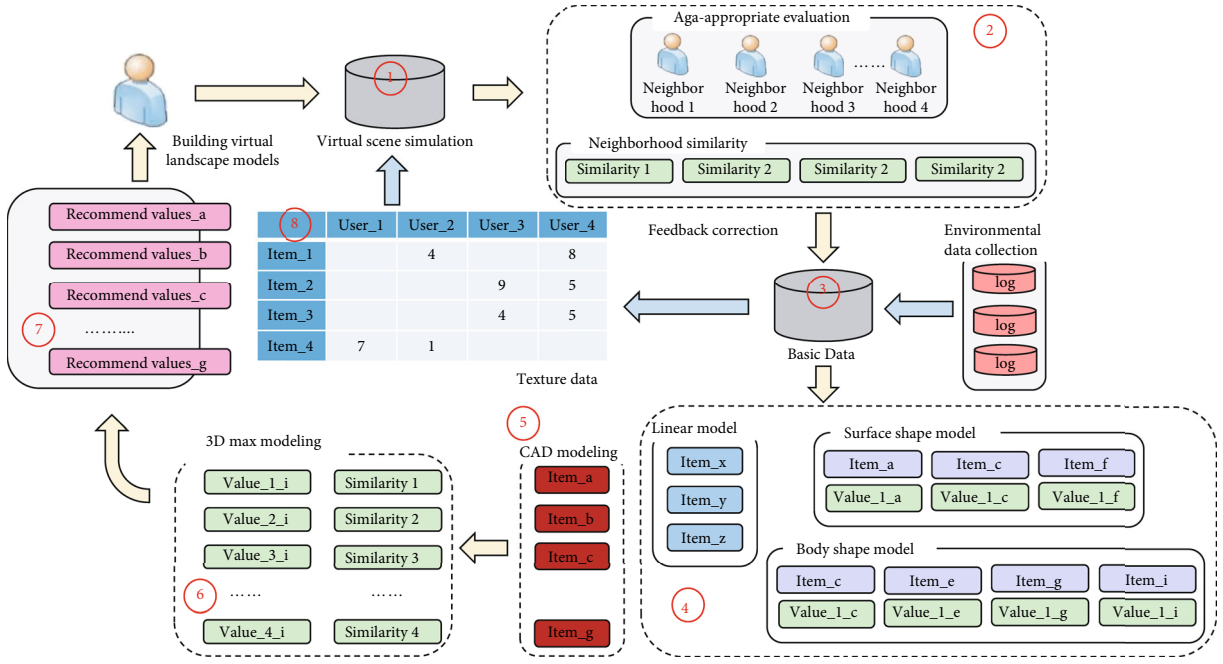

Figure 2: Global aging forecdiction.

group of park activities, the design not based on the health needs of the elderly is a failure when their physical and mental health is relatively reduced.

Therefore, building a comprehensive urban park that meets the health needs of the elderly is the top priority in the park construction. With the aging problem becoming more and more serious, the rehabilitation of urban parks is an important measure to actively deal with the problem of population aging. With the aggravation of the aging of the social population, the domestic academic circles pay more attention to the subject of aging design and construction renewal of urban public space and have conducted multiangle academic research and discussion. The scope mainly includes the planning and design of urban old and new residential areas, new and old blocks, parks and green lands, and their outdoor public space design. The levels involved in the aging design of urban public space include the layout optimization of various regional spatial resources, traffic streamline organization, space safety design, barrier free design, greening landscape, lighting, various service supporting facilities, and public operation management, so as to optimize the aging of the space to make the activities of the elderly safer, more convenient, and more comfortable.

Generally speaking, the development of the above research is a step-by-step process, and its entry angle continues to change and upgrade with the deepening of research and practice, which includes the following: from paying attention to the physiological characteristics of the elderly to paying attention to their psychological characteristics; from meeting the visual needs of the elderly to meeting their full sensory needs; from the barrier free design focusing on space to the universal design of space; and from considering

the activity safety and convenience of the elderly to considering their activity comfort. The research and practice of aging design of urban public space in China has completed the upgrading from point to area with the social development and discipline progress in the past stage, but the relevant research theory in the field of aging design of urban comprehensive parks is not mature enough.

The full text is divided into five chapters. The first chapter introduces the research background, research necessity, and chapter arrangement of this paper. The second chapter mainly introduces the current research status of urban public areas suitable for aging [3]. The third chapter mainly summarizes the needs of the elderly and puts forward the design principles. The fourth chapter mainly expounds the expression of urban park suitable for aging landscape design, and the fifth chapter mainly summarizes and prospects.

2. State of the Art

Western developed countries have entered the aging society as early as the last century. In order to effectively deal with and solve various problems caused by aging, foreign scholars have systematically studied and put forward solutions and measures to deal with the social problems caused by aging in the 1960s. At the same time, they have made positive and effective achievements and experience in the aging construction of activity venues and facilities for the elderly.

The United States entered the ranks of aging countries in 1944 [4]. The exploration of aging design is mainly the design and research of general housing and the development of elderly community. In terms of general housing, Ronald L. Mace, a professor at the University of North Carolina in the United States, put forward the concept of general design in 1980. He believed that the design of every building, equipment, supplies, and external environment should meet the use needs of everyone, and it is suitable for the elderly, the disabled, and children. A series of problems in the practical application of "exclusive" and "special" design led to the emergence of general design, and then, this design concept was applied to residential design in the United States. In 2004, the US general design center formulated universal design in house based on this concept, which is a common residential design standard that combines the general design idea with ADA (Americans with Disabilities Act) to serve all people [5]. Its proposal means that the design of ordinary residential and outdoor environment does not have the specificity of the target population and should include all people with different physical functions and age characteristics. The common feature of American elderly care community and elderly apartment is to create a comfortable living environment for the elderly through community participation and close cooperation between architects and management institutions. In this process, the cognition of the needs of the elderly, individualization of nursing, social care, and involvement of family and friends all play a good role in slowing down the aging of the elderly.

As the first country in the world to step into an aging society, France has provided a perfect service system for the elderly in terms of financial support, housing policy, and social assistance and security. Especially in the area of residential buildings for the elderly, after 60 years of development, French society has formed a relatively perfect residential service system for the elderly, mainly including ordinary houses, service-oriented residential buildings for the elderly, and medical residential buildings for the elderly [6]. The cooperation of national policies and relevant institutions, the integration of science and technology and design concepts, and the coordinated development of pension concepts and pension industry not only promote the development of residential buildings for the elderly in France but also provide reference for the research of pension industry in China.

Japan is a country with a very serious degree of aging in East Asia. In order to cope with the serious aging of society and improve the living quality of the elderly in their later years, Japan attaches great importance to the latent design at the level of adaptation to the elderly in housing design. This "longevity housing" is a major feature of Japanese elderly residential buildings. Among them, Japan's aging suitable collective housing has developed a variety of living modes and house type settings for the elderly group. At the beginning of the design, it fully considers the variability of space and the replacement of equipment, so as to ensure that the housing can be adjusted according to the changes of the elderly's self-care ability to adapt to the operation of the whole life cycle. The ideological core of this "latent design" has given substantive enlightenment to the innovative development of residential architectural design for the elderly in China at the level of specific architectural technology, design norms, and humanistic care.

The advanced practical experience and construction status of aging design in these developed aging countries are based on their developed social economy and high-quality social welfare and adapt to their respective social development stages.

Shanghai Lujiazui residential area creates a healthy residential landscape. Based on the five behavior theory of traditional Chinese medicine, plants are divided into five conservation space areas: water corresponding to spleen, wood corresponding to liver, fire corresponding to lung, gold corresponding to heart, and earth corresponding to kidney. Beijing Wanshou Park is the first park in Beijing to focus on elderly activities. It is also a national demonstration park with relatively perfect emergency risk avoidance function. There is also a centenarian Museum, in which humanized designs for the elderly can be found everywhere. Handrails to prevent the elderly from falling and soft antiskid plastic floors are all designs that highlight humanistic care. Li Li divides the special needs of the elderly into physical, psychological, and behavioral needs. Yin Yakun proposed that the special needs of the elderly are the needs of space privacy, openness and freedom, safety and health, social communication, and so on. In view of China's current situation of social aging development and special national conditions, we cannot directly copy the experience of these aging countries abroad in the research and construction practice of aging design. We can better carry out aging design and construction in line with China's national

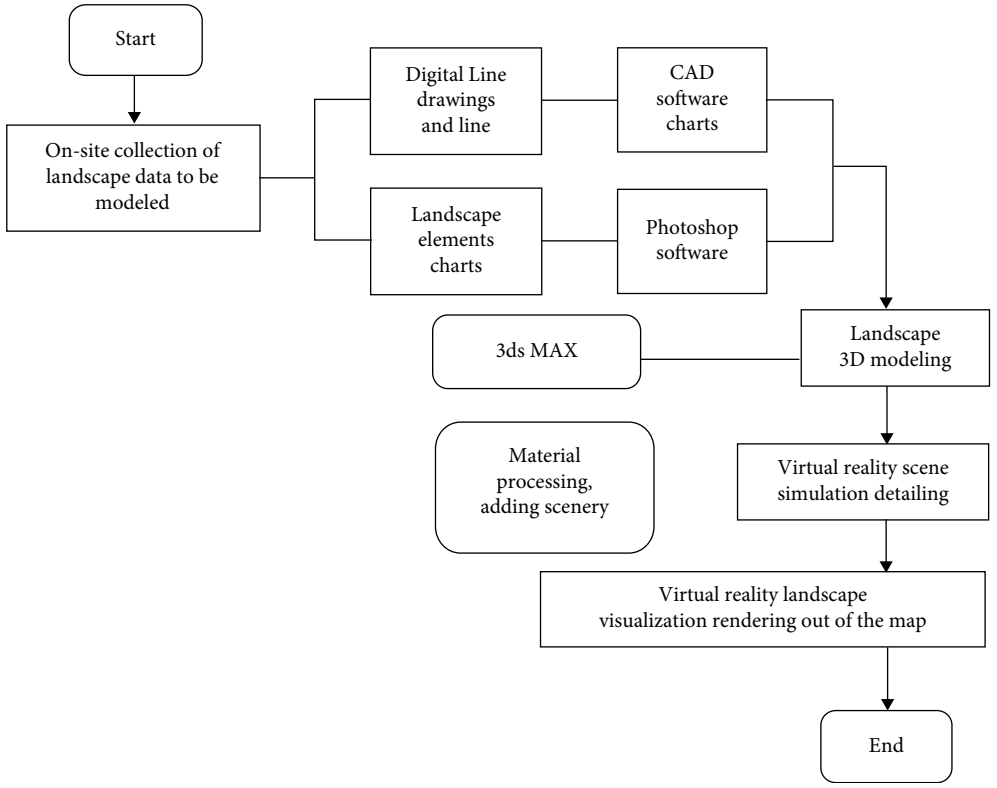

Figure 3: Aging design process of urban park landscape based on computer virtual simulation technology.

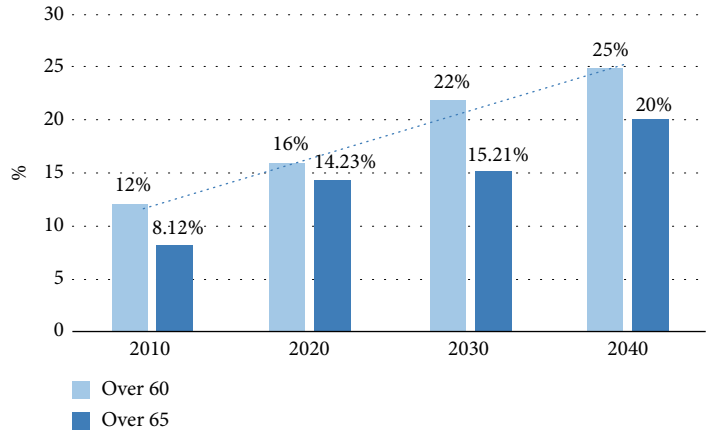

Figure 4: Design flow of virtual reality landscape simulation based on lumion.

conditions on the basis of appropriate reference to foreign advanced experience and in combination with the specific current situation of population aging, economic development, and infrastructure construction in various regions of our country.

In this regard, with the deepening of the degree of aging in China, more and more scholars have studied and discussed the problems related to aging and its impact from the two aspects of planning and outdoor public space at the outdoor level. In addition to the above two aspects, it also involves specific public service supporting facilities, various types of social services related to the elderly, and life assistance [7]. These studies involve different disciplines and fields, but they all focus on solving the problem of social aging, deeply explore the relationship between urban elements and the elderly from different angles, and solve the contradiction between the elderly and these elements through step-by-step theoretical research and practical demonstration, in order to let the elderly spend a healthy and happy old age. At present, there are few literatures on the landscape design of urban parks for the elderly, most of which are the postcompetition utilization of large parks in the process of urban renewal and the research on the aging suitability of community parks, while there are few literatures on the landscape aging design of urban parks. This paper starts from this aspect to make up for the deficiency

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Constructing landscape {
Int Section _Sign:Landscape Section Sign
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Constitute Body BodyForm:Landscape section array
Property _Form}:Landscape section properties list
Constitute Body{
Int Body_ Sign:Body (surface, point) logo
Int Section _ Sign:includes the landscape part signs of the body (surface, point)
Char Section _Code:Landscape Section Code
Int Body_ Kind:body (surface, point) structure type
Constitute Mesh MeshForm
An array of faces (lines, points) that components (faces, points)
Property _ Form}:List of landscape properties
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Algorithm 1

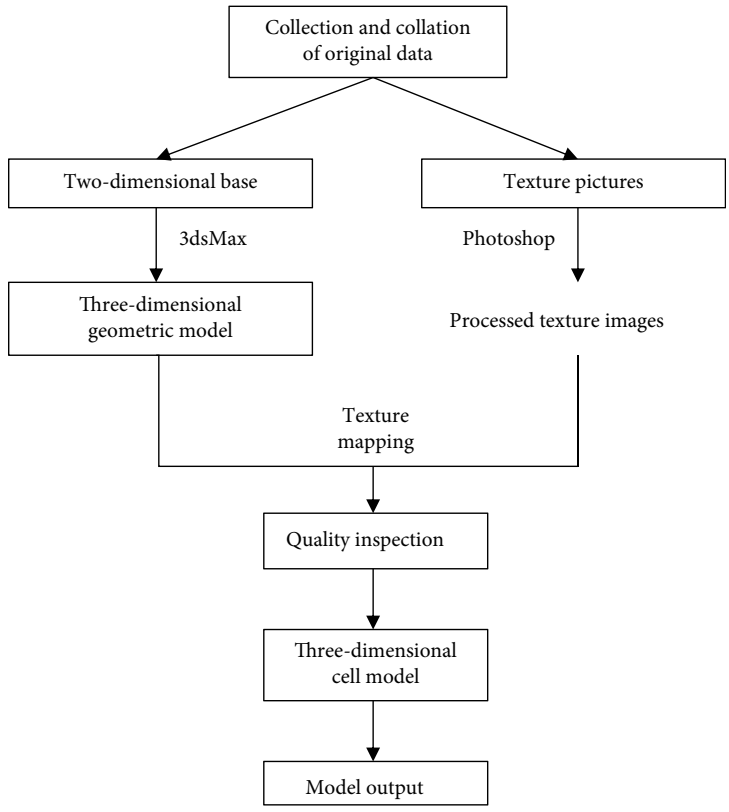

Figure 5: The specific flow chart for the 3 D modeling.

of domestic research in this aspect. Aging design process of urban park landscape based on computer virtual simulation technology can be seen in Figure 3.

3. Methodology

3.1. Virtual Reality Landscape Simulation Design Based on Lumion. In this paper, lumion is used for virtual reality landscape simulation design. It can be seen from Figure 4 that in the process of designing virtual reality landscape with lumion software, CAD, Photoshop, and other design software provide corresponding auxiliary design functions.

Collecting the landscape data to be modeled, importing the three-dimensional landscape model, processing the details of virtual reality scene simulation, and rendering the virtual reality landscape are the key steps of the design. The key step of collecting the landscape data to be modeled is field investigation and survey. The digital line drawing and linear drawing of the landscape can be obtained through GIS remote sensing image technology and aerial orthophoto image. The digital line drawing and linear drawing of the landscape are processed and optimized by CAD software. According to the results, the 3D model of the landscape is constructed by 3DS MAX software, which provides favorable conditions for the design of realistic and vivid virtual

reality landscape. The main body of material processing is the material library, which is mainly obtained by adjusting the landscape texture with Photoshop design software, and the later landscape output rendering will also be applied to the texture processing results. The data storage, rendering, and display of landscape design can be completed with the help of relevant programs. Lumion is a real-time 3D visualization tool used to produce films and still frameworks, involving areas including architecture, planning, and design. It can also deliver live demonstrations. The virtual reality landscape designed by lumion software has the advantages of high fidelity, comprehensive material types, simple use, and high postrendering efficiency. Based on these advantages, the designed virtual reality landscape has strong expressiveness and excellent visual impact effect [8].

Lumion software itself cannot build the landscape model, so 3ds Max is used to complete the landscape model construction and import the completed landscape model into lumion software. Point, line, surface, and body are the main elements to describe the landscape structure of virtual reality. This principle can be obtained by judging the attributes of the landscape. The storage structure of virtual reality landscape 3D model import is as follows:

The irregular triangulation model is used to create the visualization effect for the imported landscape model. The density of landscape topographic points can truly describe the details of the landscape [9]. This model is good at building a three-dimensional visualization model of the landscape with cumbersome and complex structure. It divides the region into connected triangular surface networks according to the limited set of points in the region. The shape and size of the triangular surface depend on the density and location of irregularly distributed measuring points. It can avoid the data redundancy when the terrain is flat and represent the digital elevation features according to the terrain feature points. Therefore, irregular triangulation model is the first choice for lumion to build 3D visualization model. The specific flow chart for the 3D modeling is shown in Figure 5.

The material processing of virtual simulation landscape design can be completed through the edit button in lumion software. Click the material edit button to get the dialog box, and execute the material processing operation according to the prompted steps. This process involves material object selection, color editing, and so on [10]. After selecting the appropriate material settings, click the assign button to take effect.

This paper evaluates the aging design of urban parks by land value, Xiangnong diversity index, and fragmentation index. The hierarchical structure model used for the evaluation is shown in Figure 6.

In the evaluation process, various parameters need to be used, and the mean value, standard deviation, and coefficient of variation also need to be used to optimize the evaluation indicators. The specific calculation formula is as follows:

$$\text{Mean calculation } M = \frac{1}{n}\sum_{1}^{n} X_i, \tag{1}$$

$$\text{Standard error}: \text{SD} = \sqrt{\frac{\sum_{i=1}^{n}(X_i - M)^2}{n-1}}, \tag{2}$$

$$\text{Coefficient of variation}: C_v = \frac{\text{SD}}{M}. \tag{3}$$

Plan measures the components of the landscape. It calculates the relative proportion of a patch type in the area of the whole landscape. It is one of the bases to help determine the dominant landscape elements in the landscape. When its value tends to 0, it indicates that this patch type in the landscape becomes very rare. When its value is equal to 100, it indicates that the whole landscape is only composed of one kind of patch [11].

$$\text{PLAND} = P_i = \frac{\sum_{j=1}^{n} a_{ij}}{A}(100). \tag{4}$$

Shannon diversity index (SHDI) is a measurement index based on information theory, which is widely used in ecology. It is widely used in community ecology to detect diversity. This index can reflect landscape heterogeneity, especially sensitive to the unbalanced distribution of patch types in the landscape [12]. In addition, SHDI is also a sensitive index when comparing and analyzing the changes of diversity and heterogeneity in different landscapes or different periods of the same landscape. For example, in a landscape system, the richer the land use is, the higher the degree of fragmentation is, the greater the information content of step qualitative is, and the higher the calculated SHDI value is.

$$\text{SHDI} = -\sum_{i=1}^{m}(p_i \ln (p_i)). \tag{5}$$

Fragmentation degree represents the fragmentation degree of landscape segmentation, reflects the complexity of landscape spatial structure, and reflects the degree of human interference to the landscape to a certain extent. It is a process that the landscape changes from a single, homogeneous, and continuous whole to a complex, heterogeneous, and discontinuous patch mosaic caused by natural or human disturbance. Landscape fragmentation is one of the important reasons for the loss of biodiversity, which is closely related to the protection of natural resources [13].

$$\text{C}_i = \frac{N_i}{A_i}. \tag{6}$$

For arbitrary loss function forms, the second-order Taylor expansion approximation can be used to achieve rapid optimization:

$$\text{obj}^{(t)} = \sum_{i=1}^{N}\left[l\left(y_i, \hat{y}_i^{(t-1)} + g_i f_t(x_i) + \frac{1}{2}h_i f_i^2(x_i)\right)\right] + \Omega(f_t), \tag{7}$$

where g_i and h_i represent the first- and second-order

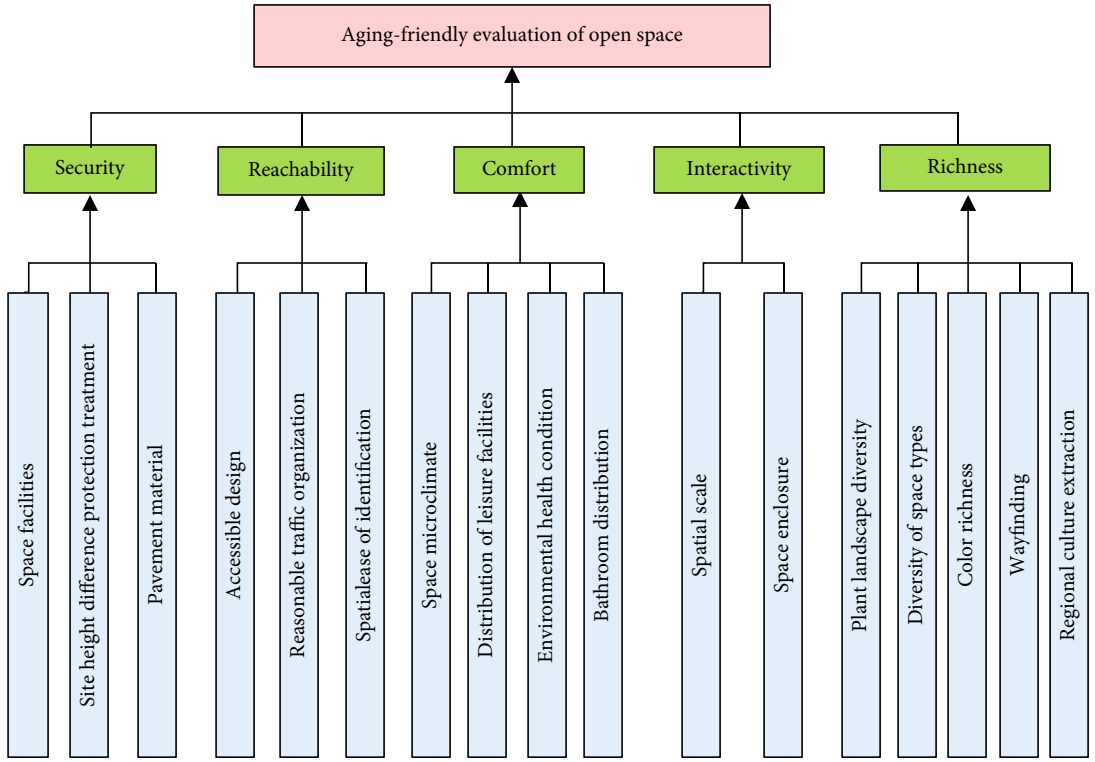

Figure 6: The hierarchical structure model used for the evaluation.

gradient statistics about the loss function, respectively.

$$g_i = \partial_{\hat{y}_i^{(t-1)}} l\left(y_i, \hat{y}_i^{(t-1)}\right),$$
$$h_i = \partial^2_{\hat{y}_i^{(t-1)}} l\left(y_i, \hat{y}_i^{(t-1)}\right). \tag{8}$$

The parsimonious objective function of the t-th iteration is obtained after removing the constant term:

$$\text{obj}^{(t)} = \sum_{i=1}^{N}\left[g_i f_t(x_i) + \frac{1}{2} h_i f_i^2(x_i)\right] + \Omega(f_t). \tag{9}$$

For a fixed structure, the best predicted value corresponding to the first leaf node can be calculated:

$$w_j^* = -\frac{\sum_{i\in I_i} g_i}{\sum_{i\in I_i} h_i + \lambda}. \tag{10}$$

3.2. Spatial Distribution of Activities of the Elderly

3.2.1. Centralized Type. Centralized spatial distribution means that the activity space of the elderly in the urban park is centrally arranged in the central area of the park. The advantage of this layout is that the elderly's activity facilities can be centrally set up with clear spatial orientation. The elderly do not need to walk around to find activity sites, which greatly improves the utilization of site facilities. At the same time, it can save land resources and facilitate unified management. However, this type of spatial distribution also has some disadvantages [14]. Different types of activity spaces cannot be distinguished and classified, and the distance between activity spaces is close. Without certain isolation measures, it is easy to interfere, and the elderly who are active in them will also have the contradiction of site occupation. Therefore, we investigated the activity forms of urban middle-aged and elderly people, and the specific results are shown in Table 1.

3.2.2. Dispersive Type. The dispersed spatial distribution is to evenly distribute the activity space of the elderly in all areas of the park, so that each activity site is connected and isolated from each other, and it is not easy to generate interference.

The space level is relatively rich. The disadvantage is that the distance is long. If the elderly want to participate in different activities, they need to walk a long distance and consume a lot of physical energy. If there is a height difference in the site, steps and ramps need to be designed between each activity area, which will cause inconvenience to the travel of the elderly, and there are some challenges in the guiding design of the space. If we cannot deal with this problem well, the elderly are easy to get lost [15].

3.2.3. Marginal Type. Marginal spatial distribution is to arrange the activity space of the elderly in the marginal area of the park. This situation is generally applicable to parks with large mountains and water bodies, which mainly have ornamental functions. This kind of park takes landscape as the main landscape and has weak activity functions, such as Nanjing Xuanwu Lake Park. The advantage of this layout

Table 1: Results of different activity types.

Type of activity	Static activity	Dynamic activity
Manifestations	Chat, sit, watch, etc.	Physical exercise, playing chess, walking, etc.

is to adjust measures to local conditions, reasonably arrange various functional spaces without changing the original geomorphic characteristics of the park, form a series of activity spaces with spatial characteristics along the mountains and rivers, create good landscape environmental conditions for the activities of the elderly, and effectively divide the space by using the mountains and rivers to avoid mutual interference of various activity areas, and this type of distribution often has clear routes and entrances and exits in the park, in which the elderly are not easy to get lost [16].

3.3. Aging Landscape Design Elements

3.3.1. Topographic Elements. According to the terrain of the site, the activities of the elderly are divided into three types. The first is sports activities that can be carried out in a flat and open space. This kind of activities is generally group activities that need a large area of space. The flat and open terrain can guide the elderly to overlook, relax their spirit, and reduce pressure. However, this terrain is too monotonous, and the elderly will be boring in the space for a long time, so seasonal pavement sketches the use of the configuration of different plants to increase the richness and hierarchy of the space and make the space more interesting [17]. At the same time, the safety of the elderly space should be evaluated. According to the survey, for the following results, see Figure 7. According to the survey results, 65.81% of the elderly are "satisfied" or "very satisfied" with the safety of the space facilities.

The second is the field activities that can be carried out under the natural height difference, such as walking and climbing. The natural undulating terrain can bring changes in speed and line of sight to the elderly. In the space design of the park, taking advantage of the terrain characteristics, it is necessary to adopt the method of adjusting measures to local conditions to design the humanized sports field space that meets the needs, and the gentle slope can be designed as a part of the fitness trail. The terrain with large ups and downs can enhance the challenge of fitness activities for the elderly, and the vision can also change significantly, enriching the sense of activity experience of the elderly [18].

The third is the height difference set under manual construction in order to highlight the use of site functions, such as sinking square and rising stage. The sunken square is very suitable for performing activities. The audience can sit on the surrounding steps to watch the activities in the sunken square. It should be noted that barrier free ramps should be set, barrier free viewing seats can be set if possible, and special space can be designed for wheelchairs for the elderly.

3.3.2. Paving Elements. In order to improve the space utilization rate of the park and attract more elderly people to participate in activities, it is necessary to design the site scientifically. As the ground is the most direct and close artificial space element in contact with the elderly, all the behaviors of the elderly in the park cannot be separated from the ground, so the pavement of the park needs to reflect the characteristics of comfort, safety, and beauty, which is a very key aspect. On the one hand, the vision of the elderly is reduced, and the materials and colors of the pavement can prompt the changes of spatial information for the elderly and effectively help the elderly identify the spatial environment. More than 85% of the visually impaired can distinguish gravel and soft material paving, 70% to 80% of the visually impaired can distinguish mortar paving and small concrete paving, and less than 70% of the visually impaired can distinguish large asphalt concrete paving. Paving can distinguish different sites through different touch of materials [19]. The guide brick of blind road and the warning brick of dangerous road section use this feature to give guidance information to the visually impaired. The space with more pedestrian activities needs to be paved with flat and nonslip materials, and the uneven gravel and other materials should be avoided as far as possible, so as to ensure the activity safety of the elderly. At the same time, the pattern and color of pavement should also meet the psychological and seasonal behavior needs of the elderly and create a good visual feeling.

3.3.3. Plant Elements. The plants in the park should pay attention to their ecological and health-care functions. Secondly, they should appropriately increase their landscape appreciation and attract the elderly to activities. The park sports space should not have too high green space rate and shrub grass. It is suitable to use the combination of multiple trees and lawns. While ensuring the accessibility of sight, it should be dominated by evergreen plants to form a green solid color background, so as to make the elderly more focused during sports. For leisure culture and communication and rest space, the role of plants is mainly ornamental, which increases the psychological comfort and pleasure of the elderly. The differentiation of sports space can be defined by the different layout and combination of local trees, shrubs, and hedges. Static activity space should create a quiet activity atmosphere, and tall hedges can block the interference of external sight noise on elderly sports activities. In places with large flow of people, attention should be paid to air circulation, and space between plants should be properly reserved to reduce the enclosure of space. In the noisy sports space, sound insulation plant belts can be set to avoid affecting nearby residents. Do not use plants with pungent smell in leisure and sports space to avoid harm to space users [20].

3.3.4. Color Elements. Color can not only affect people's mood but also affect people's health. Color has a certain

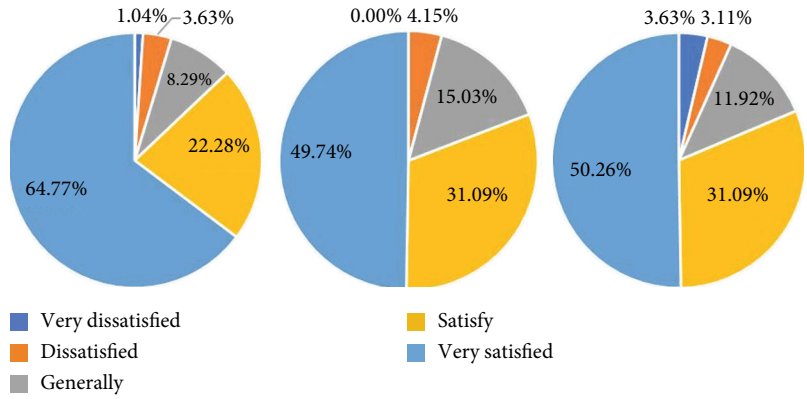

Figure 7: Statistics of the evaluation results of the term "safety."

Table 2: With acupuncture plants.

Type	Plant name	Reason
With needlepoint	Pinellia	Easy to accidentally injure people
	Yellow prickly rose	Easy to accidentally injure people
	Moonflower category	Easy to accidentally injure people
	Chinese honey locust (Gleditsia sinensis)	Easy to accidentally injure people
	Firethorn	Easy to accidentally injure people

Table 3: Color analysis.

Color	Psychological feelings
Orange	Promotes appetite, health, and well-being
Yellow	For the physically healthy can stabilize the mind and promote eating, while the physically and mentally depressed will aggravate their bad mood
White	It can stabilize the mind and keep blood pressure stable, but it is not suitable for people with autism and depression
Red	Enthusiasm, use with caution for heart patients
Black	Calming, stabilizing effect
Purple	It can relieve heart pain and can also be used to treat mental aspects, rheumatism, and epilepsy
Blue	Calms the nerves, but it is best not to use it for patients with mental exhaustion and depression

impact on people's pulse and grip strength. Experiments show that people have a normal pulse in a yellow room, a slower pulse in a blue room, and a faster pulse in a red room. Physiologists have found that under the irradiation of red light, people's grip strength is twice as strong as usual, and under the irradiation of orange light, the grip strength of the hand is half as strong as usual. Therefore, the demand for plant configuration focuses more on color diversity. The survey shows that the elderly prefer colorful plant landscape. Among the plant landscape elements of community public space, the elderly pay more attention to the vitality emitted by their own characteristics, such as color, and should plant more flowers and colorful leaf plants, which can directly stimulate the sensory experience of the elderly.

4. Result Analysis and Discussion

4.1. Pavement Expression of Aging Landscape Design. Road level and pavement. The road axis distribution of the external environment shall be smooth and the road network shall be accessible, including three types of road networks of different levels. According to the industry standard, CJJ 37-90, the width of class I road is 5 m, which is divided into carriageway and pedestrian road. The carriageway generally surrounds the periphery of the park in a ring. Asphalt pavement with high strength shall be adopted for pavement to ensure the passage and arrival of ordinary motor vehicles and fire vehicles. The pedestrian roads are distributed in the landscape area of the park and various square areas. They are open and accessible landscape axis roads [21]. The pavement is decorated with antiskid large-area burning surface and wire drawing surface natural stones and beautiful small-area polished surface natural stones. In addition to antiskid and aesthetics, the pavement base color and pattern are guiding and indicative, so as to ensure the safe and smooth passage of the elderly. The width of the secondary road is 3 m to 4 m, which is distributed in the building section in the north-south direction and various landscape

node areas to meet the walking needs of the elderly and ordinary people. The paving materials shall be paved with slightly smaller antiskid stones and colored asphalt and paved with plastic materials according to the nature needs of different places. In the pavement base color and pattern, gradient and superposition are adopted to enrich the visual effect of horizontal interface landscape, but it is still based on the convenience and accessibility of the road. The width of class III road is 2 meters to 1.2 meters. It should meet the requirement that one wheelchair can rotate or two people can pass at the same time. The width is usually 1.8 m. It belongs to the walking path distributed in small space. This class of road adopts orderly space conversion and emphasizes the unity of moving line, so that the elderly can fully feel the experience brought by moving line viewing and recreation and will not feel difficult to distinguish the direction due to the twists and turns of the path.

Materials with strong tactility and good ornamental performance can be selected for pavement. For example, the cobblestone with mosaic not only plays the role of blind path but also adds the beauty of the park and stimulates the massage effect of acupoints on the soles of the feet.

4.2. Line Expression of Aging Landscape Design. When people and healthy people walk differently, they need the width of the road to accommodate the AIDS they use, and sharp turns are inconvenient for them.

(1) Try to avoid too many curves or too urgent, monotonous, and no rest seats on the road

(2) The overall traffic flow line, each area, and building entrances and exits of the park should be designed as circular routes, connected; that is, the starting point is the end point, forming a "loop"

(3) Park traffic popularity should be blocked without obstacles, to avoid the unintentional collision between the elderly and the line of sight

The elderly walk slowly and pay attention to the atmosphere of the surrounding environment. Based on the needs of the elderly in the walking mode, the design of the walking route should be simple and interesting, and the road should be shorter and changed under the physical conditions accepted by the elderly.

4.3. Greening Expression of Aging Landscape Design. Greening the environment is conducive to the elderly to adjust their mood, increase their immunity, or recover from diseases. The greening setting in the park shall follow the principle of plant landscaping, focusing on the matching of plant species and forms.

(1) The green coverage area of the activity area in the whole area shall be 250 mm higher than the ground to prevent the elderly from falling or falling into the grass

(2) Plants planted along both sides of the road shall be trimmed in varying degrees according to the types to prevent the elderly from blocking their sight and sliding due to the falling of fallen leaves in the rainy season and maintain the beauty of the landscape. The clearance height of trees shall be kept at about 200 cm

(3) The gradient of the sidewalk should not exceed 1 : 20, and planting ponds can be set to prevent the elderly from entering the lawn by mistake

(4) Avoid planting plants with needles, as shown in Table 2

4.4. Color Expression of Aging Landscape Design. Color contains special language. People will think orange food is delicious when they see it. Generally, orange is used more in restaurants. White gives people a clean feeling and can reduce blood pressure, so the hospital uses white as the main color. Green can make people think of quiet nature and calm down, so some green plants are generally placed in the office. Similarly, different colors will also affect the mood of the elderly and encourage or inhibit the communication behavior of the elderly. For example, blue can enhance the retention of space, which is suitable for the application of outdoor seats and other facilities, and encourage the elderly to sit down and enjoy the scenery or communicate. Red and yellow make people feel lively and enhance the activity of space. They are suitable for the use of sports equipment and enhance the sports desire of the elderly, as shown in Table 3.

In addition to the influence of color on communication activities, it will also affect the visual scale and definition of space. If you use warm tone in a wide space, you can visually shorten the space distance and narrow the space range. On the contrary, the use of cold tone will have the effect of enlarging and extending the space. At the same time, colors can be used to define different sites or different areas inside the space. The commonly used space definition method is to use warm colors inside the space and cold colors at the boundary. In this way, the pavement of warm colors can increase the affinity of the space, and the boundary of cold colors will deepen the depth of the space and make the elderly feel free from formality.

5. Conclusion

From the perspective of landscape aging design of urban comprehensive park, through literature combing and research, field observation, and investigation, this paper summarizes the activity law of the elderly in the park and applies the aging design of elderly activity space to the practice of Yanziji park by using computer simulation technology, which provides theoretical basis reference and practical design experience for the aging design of comprehensive sports park.

Firstly, this paper introduces the background of aging in China, and the state gradually begins to pay attention to the problem of providing for the aged. Then, it summarizes the urgent need for aging design in comprehensive parks, which is an important carrier of activities for the elderly, and

discusses the aging design strategy of urban comprehensive parks.

Although the research process of this paper is not very perfect, it provides an effective reference for the research on the aging suitable construction of urban comprehensive parks and even all activity venues for the elderly. In the future architectural design study, the authors will continue to deeply study the space aging suitable design used by the elderly, so as to make a contribution to the development of the cause of aging in our country.

Data Availability

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

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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