Hindawi
Wireless Communications and Mobile Computing
Volume 2023, Article ID 9873746, 1 page
https://doi.org/10.1155/2023/9873746

Retraction

Retracted: Three-Dimensional Simulation Garden Landscape Design Method Based on Virtual Simulation Technology

Wireless Communications and Mobile Computing

Received 18 July 2023; Accepted 18 July 2023; Published 19 July 2023

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] S. Chen and X. Wang, "Three-Dimensional Simulation Garden Landscape Design Method Based on Virtual Simulation Technology," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 4804256, 7 pages, 2022.

Hindawi
Wireless Communications and Mobile Computing
Volume 2022, Article ID 4804256, 7 pages
https://doi.org/10.1155/2022/4804256

Research Article

Three-Dimensional Simulation Garden Landscape Design Method Based on Virtual Simulation Technology

Shasha Chen [1] **and Xiaolan Wang** [2]

[1]*School of Fine Arts, Baoji University of Arts and Sciences, Baoji, Shaanxi 721013, China*
[2]*Network and Information Management Office of Baoji University of Arts and Sciences Baoji, Shaanxi 721013, China*

Correspondence should be addressed to Shasha Chen; 202007000197@hceb.edu.cn

Received 29 June 2022; Revised 23 July 2022; Accepted 29 July 2022; Published 12 August 2022

Academic Editor: Balakrishnan Nagaraj

In order to further promote the design and development of 3D simulated garden landscape, the author proposes a method of 3D simulated garden landscape design based on virtual simulation technology. By combining virtual simulation technology and traditional 3D simulation garden landscape design method, a 3D garden landscape simulation system is constructed, thereby realizing the improvement of 3D simulation garden landscape design method and further promoting the development of 3D simulation garden landscape design. Experimental results show that with the gradual expansion of the scope, the accuracy of the method used by the author gradually improved, reaching a maximum of about 89%, while the traditional method was always maintained at about 40%, and the judgment rate was doubled compared with the traditional method. *Conclusion*. By combining virtual simulation technology and traditional 3D simulation garden landscape design method, the development of 3D simulation garden landscape design can be effectively promoted.

1. Introduction

Garden landscape design requires the use of landscape architectural design concepts based on park planning and the integration of the use of scientific, technological, and artistic tools to design and protect outdoor environment [1]. The work design should not only look good but also be in harmony with the environment. It includes urban development, community development, site development, environmental development, and building construction and refers to the integration of gardens, landscape with life, environment, and culture, as well as sustainable development, protection, conservation, and natural use. Capital layer: how to show the design in detail, realistically and uniformly, because the landscape design of the park, regardless of the scale, wants to show the effect of an event in a time, and the scene moves at every step of the spatial organization? This approach is very important for designers and it helps to have a clear design idea of the garden designer.

Most existing building designs use AutoCAD software to draw two houses [2]. Local specialized software has started late and is often responsible for planting trees by building software. For example, HCAD software in Hangzhou and Hongye software is all kinds of planning software. Since most software is developed by a third-party platform, such as AutoCAD, in addition to protecting the right software, it only uses the platform features to easily draw the house and has little bit degree of 3D modeling or statistical data automation [3]. It is only used as a "pen" but not as a design tool. This software only needs to be classified as professional planning and software development, and it is difficult to get approved by the kindergarten industry due to the lack of technical know-how in the garden. Virtual simulation technology is a product that combines digital technology with the use of digital technology based on the rapid development of information technology such as multimedia technology, virtual reality technology, and network communication technology and are better design models [4]. A unique feature of virtual simulation technology is the creation of integrated, complete virtual environments for all systems, as well as the integration and management of multiple organizations of the virtual environment.

Therefore, in order to better audit the 3D simulated garden landscape, the author introduces the virtual simulation technology into it, by combining the virtual simulation technology and the traditional garden landscape design method, a 3D garden landscape simulation system is constructed to realize the design of the 3D simulated garden landscape.

2. Literature Review

With the acceleration of urbanization in China, people are paying more and more attention to the garden landscape environment. Influenced by urban landscape design and national history, the integration of traditional cultural connotations has played a very important role. Landscape is an important part of environmental greening and aesthetics, and the rationality of spatial distribution is restricted by various aspects; in this case, it is of great significance to study a reasonable method of garden landscape simulation and judgment [5]. There are several methods for judging the rationality of garden distribution in China. Judgment method based on weighted average theory, this method can effectively describe the geometric parameters of garden landscape and perform accurate calculation, but there is a problem that it is difficult to accurately judge whether the distribution is reasonable. Based on the network projection judgment method, this method has a high accurate judgment effect, but there is a problem of poor evaluation stability [6]. At present, people most often use the deep estimation judgment method, which has problems such as large judgment error and low speed and cannot meet the needs of high-precision judgment. Simulation technology, or simulation technology, is the technology of imitating another real system with one system [7, 8].

Based on the above theoretical research, the author proposes a 3D simulation garden landscape design method based on virtual simulation technology, by combining virtual simulation technology and traditional 3D simulation garden landscape design method; a 3D garden landscape simulation system is constructed to realize 3D simulation, improvements in garden landscape design methods, further promote the development of 3D simulation garden landscape design.

3. Research Methods

3.1. 3D Garden Landscape Simulation System

3.1.1. System Overview

(1) System Architecture. The 3D landscape design simulation system is first of all a computer-aided design system, which has comprehensive functions and can help designers to quickly complete the preliminary design and the later result display [9]. The system is based on garden landscape design, with terrain design, planning design, and planting design as the main content, integrating architectural modeling and road design; while completing the graphic design, the scene can be dynamically browsed with OpenGL, and the real-time rendering and 3D simulation animation can be produced in real time, and the scene can be displayed in multiple directions and all angles [10]. The system can be roughly divided into several modules: modeling and editing, terrain design, planning and design, planting design, sprinkler irrigation design, data statistics, construction drawing production, and rendering and animation production; the overall architecture of the system is shown in Figure 1.

(2) Drawing Technology Based on Virtual Simulation Technology. In landscape animation, a very important technique is the drawing technique [11]. Due to the large amount of model data in the garden design industry, the system has high requirements for display speed and rendering effect. The system adopts the contour line technology to improve the drawing effect, deeply researches the OpenGL related content, and optimizes the specific realization algorithm of the drawing. The content is as follows.

Although computer graphics hardware has developed quite rapidly, large-scale fine meshes are not suitable in all cases, and coarse meshes still play an important role in some cases [12]. In the drawing of rough meshes, the contour line needs special treatment; here, a contour line smoothing technology is proposed, optimizing the outline drawing of rough meshes, solving the problem of how to make rough mesh outlines draw more natural and smoother without a finer model. The algorithm assumes that only coarse meshes exist and mainly consists of six parts. (1) Calculate the visible silhouette edges and associated triangles of the mesh at a certain viewing angle. (2) Project these silhouettes onto a 2D viewing plane to obtain a series of 2D line segments. (3) Use Hermite interpolation to replace line segments with smooth curves. (4) It is assumed that these smooth curves are the projections of the three-dimensional smooth contour lines on the viewing plane, so the curves are projected to three dimensions to obtain smooth contour lines. (5) Resample on the three-dimensional curve, and calculate the texture coordinates of the sampling points. (6) Retriangulate the mesh, map the texture, and draw the final model. The algorithm proposed here requires only coarse meshes, and no fine meshes exist [13, 14]. Second, during the run phase, only the silhouette edges of the rough mesh are extracted, which is much faster. Experiments show that this optimization process takes 80% more time than drawing the original mesh, but much less time than drawing one that gives an approximate mapping effect on the boundaries.

Flow field visualization is a classic research direction in scientific computing visualization research, and it is widely used in fluid mechanics, weather forecasting, and detonation data simulation [15]. A new method for visualizing 2D flow fields with semiregular textures is presented, extending the state-of-the-art texture synthesis algorithms and discussing how to strike a balance in maintaining continuity between frames and the texture structure of samples, and proposes two features via deformation matrices: a method to measure the degree of texture deformation [16]. Compared with the

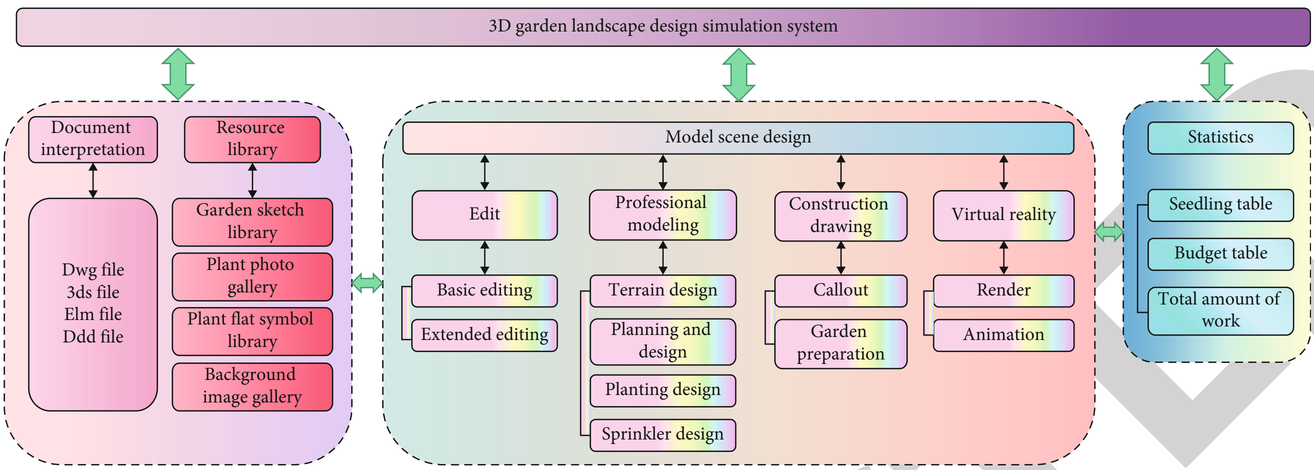

Figure 1: System architecture.

existing texture-based flow field visualization technology, the algorithm is a brand-new method; it does not use noise texture as input, but reinterprets the flow field with sample texture containing structure and direction information; it is also very different from the original method, but still expresses the internal characteristics of the flow field well [17]. Since many semiregular textures in nature can be used as input sample textures, the algorithm not only provides a new flow field visualization algorithm but also greatly enriches the variety of visualization results. Different from the traditional method based on noise texture, the method proposed here directly uses the directional information contained in the semiregular texture itself to visualize the flow field, the results are intuitive and effective, and the applicable texture range is wide, which enriches the means of flow field visualization. In the previous algorithm, after synthesizing the first frame, all pixels in each small block move forward at the same average speed. When each small block moves to a new position, if the original speed direction of a certain point and the current position are direction is not correct, then this point is the invalid point [18]. It can be seen that the previous algorithm only considers the translation mode of the texture block, while ignoring its reasonable rotational motion; therefore, when the flow field is complex, simple translation will often cause too many invalid points, prolonging the synthesis time; at the same time, too many newly introduced small blocks also reduce the continuity between frames, making the algorithm unsuitable for the visualization of unsteady flow fields [19]. The new algorithm proposed here overcomes these difficulties, allowing the rotation of texture patches, resulting in enhanced frame continuity and reduced composition time. Experiments show that the new method is only about half of the previous algorithm (all times are measured on a PC with 2 GHz CPU and 512 M memory).

In order to improve the drawing effect, it is necessary to study OpenGL technology in depth. In the new version of OpenGL (1.3 specification), OpenGL provides new techniques for drawing. The HPBUFFERARB PBuffer object provides a mechanism for off-screen drawing of target objects, which is an extended form of wgl. The background pixel buffer sets a 24-bit color buffer and a 32-bit depth buffer; the relationship between the pixel buffer size and video memory can be expressed as $\text{memory} = \text{width} * \text{height} * (24 + 32)$. Since the application also needs to be displayed, the storage capacity of the graphics card must be much larger than this result. Using OpenGL PBuffer off-screen rendering to determine the visibility of large-scale mesh models, it mainly includes the following five steps. The first step is to create the background window, define the window pixel format specification, set the pixel format of the device description table, create the drawing description table, and activate the device description table and the drawing description table. The second step is to use wgl Choose Pixel Format ARB to obtain a list of pixel formats with specified attribute characteristics, use wgl Create PBuffer ARB to create a pBuffer object, obtain the associated DC of the PBuffer, and create an Open Context, that is, the environment associated with the PBuffer (including GL frame buffer initialization, setting GL viewport, setting GL transformation matrix, and graphics card hardware programming settings). The third step is to enter the OpenGL context of the PBuffer and draw the mesh triangle data. The fourth step is for each triangular patch in the mesh model, take the coordinates of the midpoint of the triangle to transform the coordinates from the model space to the viewport space, use gl Read Pixels to read the depth data of the PBuffer, compare the depth value corresponding to the viewport coordinates, and set the visibility flag of the patch [20]. Step 5 is to restore the settings of the background pixel buffer, delete the draw description table, release the device description table of the window, and destroy the window.

3.2. System Calculation Principle, Method, and Calculation Formula

3.2.1. 3D Simulation Terrain Design. 3D simulation garden landscape design simulation system uses integrated modeling (RSG) to complete the line area modeling and design. The system uses a basic interpolation algorithm to model the constraint height measurement points or ground contour data to model a three-dimensional area with a triangle, which is then transformed to the data network always, for example, digital upgrade models (DEM). Using local interpolation algorithms, it can convert altitude sampling or contour line data to modern network DEM data. After a simple change of the calculation result and the accuracy of the result, the proposed return weight is finally used in the calculation to create a 3D network environment. The accuracy of the location simulation depends on the accuracy of the natural model, which is the reality of the original location in 3D model based on the ground data, which can make the designer focus data analysis. In order to avoid sampling point accuracy and various factors affected by modeling, the system uses manual sampling point control, which achieves the desired results. The application of the DEM model in the design space can not only be site-based but also complete the analysis, site-level and refinement [21].

3.2.2. Discrete Point Terrain Elevation Calculation Principle and Formula. The system adopts the principle of inverse distance weight method elevation interpolation calculation to realize the elevation calculation of discrete point terrain.

Shepard's method is the simplest "inverse distance weight" interpolation method.

$$F(x, y) = \sum_{i=1}^{n} w_i f_i. \tag{1}$$

n is the number of points around (x, y) to define its z value.

$$w_i = \frac{h_i^{-p}}{\sum_{j=1}^{n} h_j^{-p}}, \tag{2}$$

$$Z = \frac{\sum_{i=1}^{n} \left(1/(D_i)^p\right) Z_i}{\sum_{i=1}^{n} 1/(D_i)^p}. \tag{3}$$

P is the exponent, usually set to 2.

h_i is the distance between the interpolation point and the known point i.

$$h_i = \sqrt{(x - x_i)^2 + (y - y_i)^2} \quad \text{or } h_i = \sqrt{(x - x_i)^2 + (y - y_i)^2 + (z - z_i)^2}. \tag{4}$$

The U.S. Department of Defense Groundwater Model (GMS) uses the following weighting formula.

$$w_i = \frac{\left[(R - h_i)/Rh_i\right]^2}{\sum_{j=1}^{n} \left[(R - h_j)/Rh_j\right]^2}. \tag{5}$$

h_i is the distance between the interpolation point and the known point i.

R is the distance between the interpolation point and the farthest point.

3.3. Research on the Rationality Judgment Method of 3D Landscape Simulation System

3.3.1. 3D Image Data Acquisition. In daily life, due to the influence of weather factors, architectural factors, etc., the reasonable distribution of garden landscape design cannot be guaranteed. To this end, a three-dimensional image garden landscape data collection process is designed, and the analysis and judgment of this process is shown in Figure 2.

It can be seen from Figure 2 that the 3D image garden landscape data collection first collects the implicit data and normal data of the landscape distribution, then enters the data into the database for classification, and makes reasonable judgments based on the landscape design data [22].

3.3.2. 3D Image Rationality Judgment Model Based on Virtual Simulation Technology. According to the data characteristics obtained above, a 3D image garden landscape design rationality judgment model based on virtual simulation technology is constructed, and the 3D visualization method is used to display the rationality judgment results of landscape design. Taking the garden landscape design data as the input, the simulation characteristic parameters are determined, and finally, the rationality judgment result is obtained; the construction of the model is shown in Figure 3.

As can be seen from Figure 3, the model for judging the rationality of landscape design based on 3D image simulation mainly includes two parts. One part is a computer simulation model of garden landscape. The other part is a computer simulation model of three-dimensional characteristics, through which the inertia factor of simulation judgment can be obtained.

Using this model, by introducing the dynamic forward judgment and reverse judgment methods, the obtained inertia factor is judged positively, and then, the reverse judgment of each characteristic structure is obtained; by judging whether the garden landscape design is reasonable, the rationality of the three-dimensional garden landscape simulation system is judged [23].

In order to prove the validity of the proposed three-dimensional image simulation judgment method for the rationality of garden landscape design, it is necessary to design experiments to verify. A three-dimensional image model analysis platform for the rationality of garden landscape distribution is constructed under Windows 8 environment. Reasonable collection, identification, and analysis are carried out through 3D images, and the objective function values of different matrices are calculated; if the function value is large, the judgment and analysis of garden landscape are more accurate. If the function value is small, it means that the judgment of the rationality of garden landscape design is not accurate.

4. Results and Discussion

The following is an experimental analysis of the rationality of the three-dimensional garden landscape simulation system.

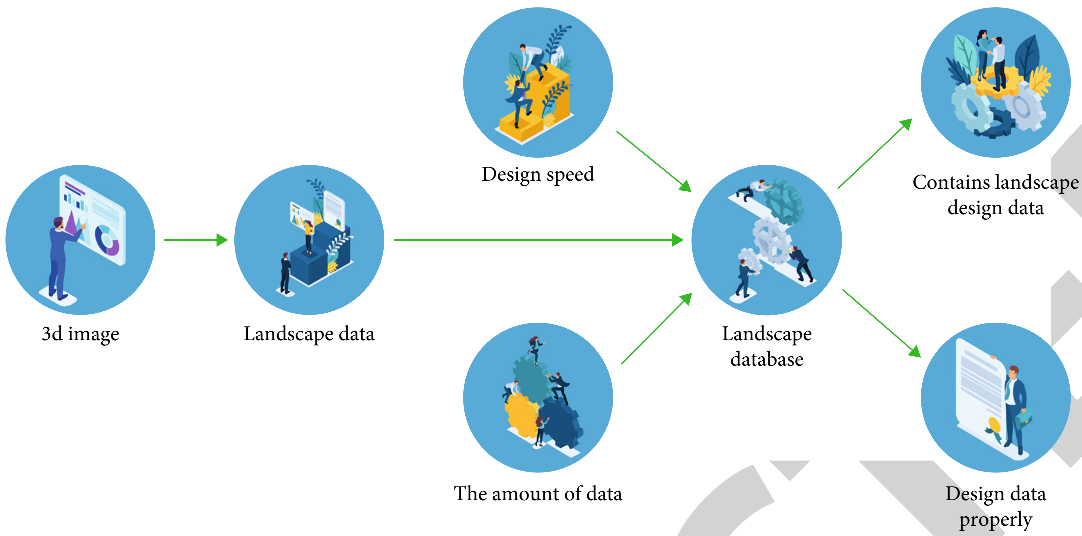

FIGURE 2: 3D image garden landscape data collection process.

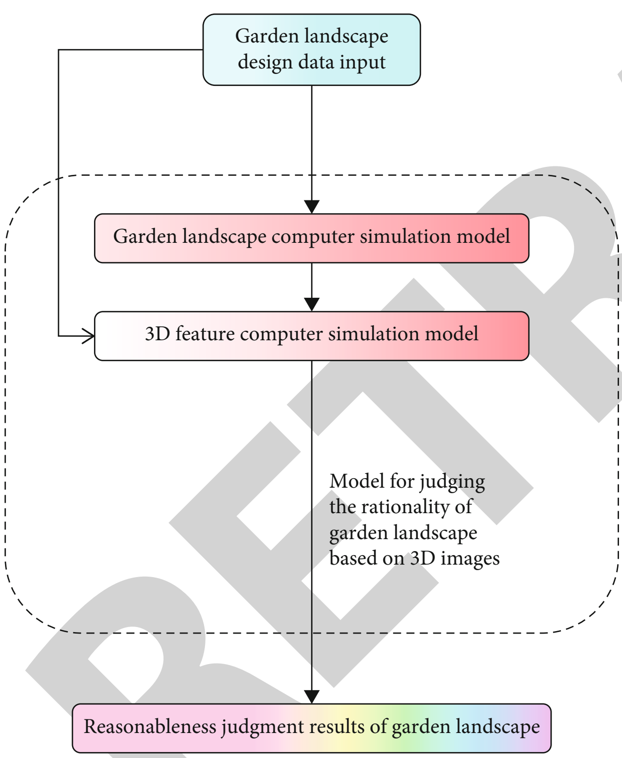

FIGURE 3: 3D image simulation judgment model.

4.1. Image Feature Point Matching Number and Matching Rate Results and Analysis. The 3D image simulation judgment method and the traditional deep estimation judgment method are used to compare the rationality of the garden landscape design; whether the number of image feature points can be used to judge the accuracy of the 3D image simulation of the garden landscape, the key factor is how to accurately match the corresponding attributes of the landscape garden image feature points [24]. At the same time, these two judgment methods are used to compare the matching number and matching rate of landscape feature points, and the results are shown in Table 1.

It can be seen from Table 1 that the matching number and matching rate of garden landscape feature points obtained by traditional deep evaluation judgment method are all lower than the three-dimensional image simulation method used by the author, and the number of image feature points in the matching process is simpler. The 3D image simulation method has a high feature point matching rate, which fully proves the rationality of using this method.

4.2. Judgment Rate and Accuracy Comparison Results and Analysis. The data was collected in the landscape environment, and the judgment rate analysis was carried out between the traditional method and the author's method, as shown in Figure 4.

During the period between 0 and 10, the visual value of the process always increases gradually, but is always lower than that of the three-dimensional simulation method, as shown in Figure 4. It has been determined that the process usually begins to depreciate at intervals of between 10 and 15. In real time, the process always shows up and down, with the fastest being only about 1/2 of the fastest for simulating 3D images. It can be seen that the traditional process used to measure the quality of a garden landscape is slow and tedious; 3D image modeling process based on virtual simulation technology is faster. The comparative results of filtration are shown in Figure 5. As shown in Figure 5, when the filtering range is less than 20%, the traditional method and the authorization method are slightly different in the fact they assess the landscape. Designs and procedures are always more detailed than the author's method. When the filtration volume is 20%-45%, the accuracy of the filtration standard is higher than that of the collection method. However, as the expansion expands, the accuracy of the method used by the writer gradually increases to a maximum of 89%, while the standard is always around 40%. This shows that the 3D landscape simulation system based on virtual

Table 1: The matching number and matching rate of three-dimensional image feature points of the two methods.

Group	Traditional method		3D garden landscape simulation system	
	Number of matches (piece)	Match rate (%)	Number of matches (piece)	Match rate (%)
A	540	30.25	680	75.28
B	350	25.61	460	63.16
C	360	24.32	400	50.12
D	320	27.02	390	44.32
E	280	21.34	340	30.15
F	256	30.16	303	29.38

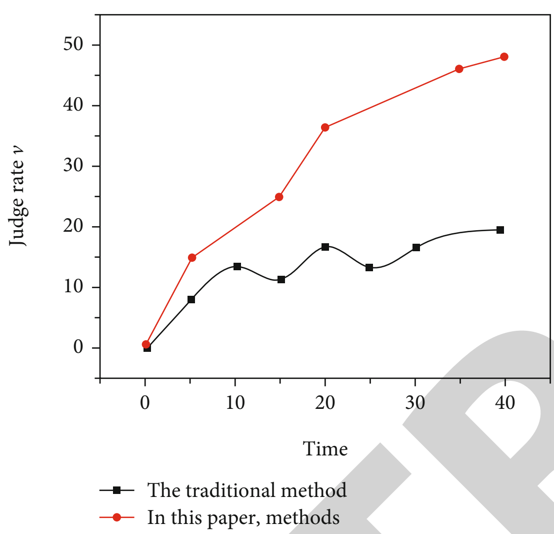

Figure 4: Comparison results of two methods to judge the rate.

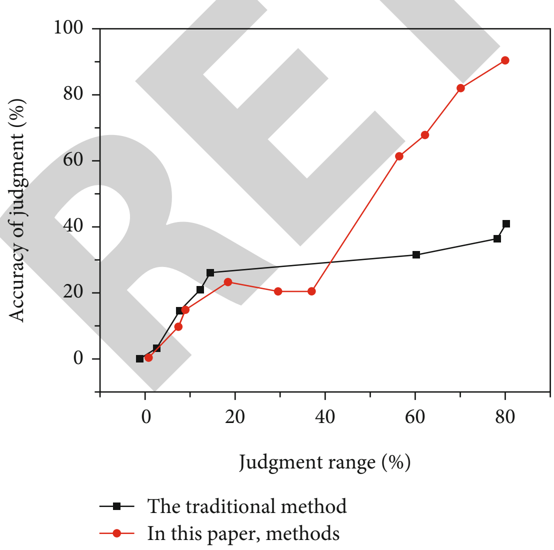

Figure 5: Comparison results of the two methods to judge the accuracy.

simulation technology is more accurate than the traditional methods used to measure the quality of landscape design [25].

5. Conclusion

The author proposes a 3D simulation garden landscape design method based on virtual simulation technology; by combining virtual simulation technology and traditional 3D simulation garden landscape design method, a 3D garden landscape simulation system is constructed, and then, the 3D simulation garden landscape design method is realized, improved, and further promoted the development of 3D simulation garden landscape design. The experimental results show that as the scope gradually expands, the accuracy of the method used by the author gradually increases, while the traditional method always maintains around 40%, describing the 3D simulation garden landscape design method based on virtual simulation technology and further promoting the development of 3D simulation garden landscape design.

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 that they have no conflicts of interest.

Acknowledgments

The study was supported by the special projects of the Education Department of Shaanxi Province in 2020, Research on the sustainable development strategy of traditional village cultural landscape in Guanzhong of Shaanxi Province under the mode of community construction (Project No. 20JK0020).

References

[1] A. A. Batmazova, E. V. Gaidukova, and I. O. Vinokurov, "On the issue of using autocad to assess flow rates (on the example of the Kama reservoir)," in *IOP Conference Series: Earth and Environmental Science*, vol. 834no. 1, p. 012002, Beijing city of China, 2021.

[2] L. K. Toudeshki, M. A. Seyyedi, and A. Salajegheh, "A context-aware architecture for realizing business process adaptation strategies using fuzzy planning," *International Journal of Software Engineering and Knowledge Engineering*, vol. 32, no. 1, pp. 37–70, 2022.

[3] J. Luo, D. Sun, S. Lai, Y. Chen, and Z. Wu, "Research on the role of virtual simulation technology in the optimization of equipment and instruments in medium voltage non-power outage operation," *Journal of Physics Conference Series*, vol. 1915, no. 4, p. 042069, 2021.

[4] Z. Huang, Q. Chen, L. Chen, and Q. Liu, "Relative similarity programming model for uncertain multiple attribute decision-making objects and its application," *Mathematical Problems in Engineering*, vol. 2021, no. 4, p. 16, 2021.

[5] Q. J. Suehr, B. P. Marks, E. T. Ryser, and S. Jeong, “Modeling the propagation of Salmonella within bulk almond using discrete element method particle simulation technique,” *Journal of Food Engineering*, vol. 293, no. 3, p. 110363, 2021.

[6] K. Yao and S. Huang, “Simulation technology and analysis of military simulation training,” *Journal of Physics: Conference Series*, vol. 1746, no. 1, p. 012020, 2021.

[7] L. Bossér and J. D. Bossér, “Target echo calculations using the opengl graphics pipeline,” *Applied Acoustics*, vol. 181, no. 9, p. 108133, 2021.

[8] D. Zou and C. Wang, “Design hand drawing expression techniques under the background of informatization,” *Journal of Physics: Conference Series*, vol. 1744, no. 3, p. 032016, 2021.

[9] N. Brunetière and A. Francisco, “Multiscale modelling of lubrication between rough surfaces: application to gas lubrication,” *Lubrication Science*, vol. 34, no. 1, pp. 54–65, 2022.

[10] N. Husna and Z. Abidin, “Development of student worksheets on ethnomathematics-based trigonometry through project-based learning models,” *Journal of Physics: Conference Series*, vol. 1882, no. 1, p. 012071, 2021.

[11] L. Ayoub, B. Pradhan, Z. Naiji, G. Abdelali, and A. Monir, “The manifestation of Vis-nirs spectroscopy data to predict and map soil texture in the triffa plain (Morocco),” *Kuwait Journal of Science*, vol. 48, no. 1, pp. 111–121, 2021.

[12] P. Rautek, M. Mlejnek, J. Beyer et al., “Objective observer-relative flow visualization in curved spaces for unsteady 2d geophysical flows,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 27, no. 2, pp. 283–293, 2021.

[13] C. Wang, J. Zhang, J. Chen, R. Zhong, and Z. Chen, “Understanding competing effect between sorption swelling and mechanical compression on coal matrix deformation and its permeability,” *International Journal of Rock Mechanics and Mining Sciences*, vol. 138, no. 6, p. 104639, 2021.

[14] Q. Ba, Y. Liu, Z. Zhang, W. Xiong, and K. Shen, “Analysis of the flow field characteristics associated with the dynamic rock breaking process induced by a multi-hole combined external rotary bit,” *Fluid Dynamics and Materials Processing*, vol. 17, no. 4, pp. 697–710, 2021.

[15] W. Y. Yan, “Scan line void filling of airborne lidar point clouds for hydro-flattening dem,” *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 14, pp. 6426–6437, 2021.

[16] I. B. Rojo and T. Guenther, “Vector field topology of time-dependent flows in a steady reference frame,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 26, no. 1, pp. 280–290, 2020.

[17] D. Greiffenberg, M. Andr, R. Barten, A. Bergamaschi, and J. Zhang, “Characterization of chromium compensated gaas sensors with the charge-integrating jungfrau readout chip by means of a highly collimated pencil beam,” *Sensors*, vol. 21, no. 4, p. 1550, 2021.

[18] M. Bradha, N. Balakrishnan, A. Suvitha et al., “Experimental, computational analysis of Butein and Lanceoletin for natural dye-sensitized solar cells and stabilizing efficiency by IoT,” *Environment, Development and Sustainability*, vol. 24, no. 6, pp. 8807–8822, 2022.

[19] J. Hu, Y. M. Kang, Y. H. Chen, X. Liu, and Q. Liu, “Analysis of aerosol optical depth variation characteristics for 10 years in Urumqi based on modis_c006,” *Huan Jing ke Xue= Huanjing Kexue*, vol. 39, no. 8, pp. 3563–3570, 2018.

[20] P. Ajay, B. Nagaraj, R. Arun Kumar, R. Huang, and P. Ananthi, “Unsupervised hyperspectral microscopic image segmentation using deep embedded clustering algorithm,” *Scanning*, vol. 2022, Article ID 1200860, 9 pages, 2022.

[21] Q. Zhang, “Relay vibration protection simulation experimental platform based on signal reconstruction of MATLAB software,” *Nonlinear Engineering*, vol. 10, no. 1, pp. 461–468, 2021.

[22] S. Yang and J. Yang, “Design of urban landscape visual simulation system based on three-dimensional simulation technology,” *International Journal of Industrial and Systems Engineering*, vol. 36, no. 2, p. 266, 2020.

[23] G. Veselov, A. Tselykh, A. Sharma, and R. Huang, “Special issue on applications of artificial intelligence in evolution of smart cities and societies,” *Informatica (Slovenia)*, vol. 45, no. 5, p. 603, 2021, http://www.informatica.si/index.php/informatica/article/view/3600.

[24] Z. H. O. U. Liping, C. H. E. N. Hua, C. A. I. Miaoqing, M. O. Jiajie, C. H. E. N. Ning, and R. Zhang, “Three-dimensional green biomass and environmental and ecological benefits of plants in yu yam ancestral garden,” *Journal of Landscape Research*, vol. 12, no. 3, pp. 82–88, 2020.

[25] N. Begliarov, E. Mitrofanov, and V. Kiseleva, “Generating a three-dimensional measuring scene for the forest sector as based on modern geodetic technologies,” in *IOP Conference Series: Earth and Environmental Science*, vol. 875no. 1, p. 012083, Beijing city of China, 2021.