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Retraction

Retracted: Application of GIS and Multisensor Technology in Green Urban Garden Landscape Design

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) Manipulated or compromised peer review

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] D. Shen, "Application of GIS and Multisensor Technology in Green Urban Garden Landscape Design," *Journal of Sensors*, vol. 2023, Article ID 9730980, 7 pages, 2023.

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Research Article

Application of GIS and Multisensor Technology in Green Urban Garden Landscape Design

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In order to solve the problem of low definition of the original 3D virtual imaging system, the author proposes the application method of GIS and multisensor technology in green urban garden landscape design. By formulating a hardware design framework, an image collector is selected for image acquisition according to the framework, the image is filtered and denoised by a computer, the processed image is output through laser refraction, and a photoreceptor and a transparent transmission module are used for virtual imaging. Formulate a software design framework, perform noise reduction processing on the collected image through convolutional neural network calculation, and use pixel grayscale calculation to obtain the feature points of the original image, and use C language to set and output the virtual imaging, thus completing the software design. Combined with the above hardware and software design, the design of 3D virtual imaging system in garden landscape design is completed. Construct a comparative experiment to compare with the original system. The results showed the following: The designed system has a significant improvement in the clarity, the original system clarity is 82%~85%, and the image clarity of this system is 85%~90%. In conclusion, the author designed the method to be more effective.

1. Introduction

With the continuous improvement of people's material and living water quality and the change of the main contradictions in Chinese society, people's appreciation level has also been continuously enhanced, and higher requirements have been put forward for aesthetic appreciation, leisure health care and health recuperation. As the artery of the city, the road is the most frequent place for urban people to move and use and the most user-involved environmental space in urban garden landscape design [1]. Under the current social situation, urban residents are under great pressure in life and work, and they are eager for some places where their lives and work can be satisfied; the second road environment is the place where urban residents have the most contact and stay for the longest time in their life and work. At present, in the public leisure space in most cities in China, including parks and green spaces in major cities, most urban landscape road designs are mainly reflected in the user's visual perception level, when users are in such a visually colorful garden landscape environment for a long time middle, the surrounding environment will become monotonous and boring, and the user and the environment lack emotional communication and cannot feel from other senses. With the improvement of residents' living standards, people are more urgently in need of a garden landscape environment that is pleasing from multiple senses; therefore, garden landscape design from the five senses design and people's multiple senses is a modern social situation to meet the living needs of urban residents. Inevitable development trend [2]. Design is a purposeful creative act that serves people, and the design of garden landscape is to make urban residents meet the real-life problems at the same time, it can make the road users more pleasing to the eyes, and through the five senses, design can build a bridge of communication between the garden landscape and the subjective feelings of the human body. The author mainly studies the concepts and ideas of predecessors in the design of five senses and innovatively applies them to landscape design [3]. By summarizing and summarizing the principles of garden landscape design, the concept of five senses design can be added to the process of garden landscape design, so that garden landscape design can be reflected in people's daily life in a more delicate and diverse manner in real life.

2. Literature Review

Meerakker focuses on the introduction of parametric software, especially modeling and the use of visualization software. The parametric software is mainly involved in the construction of terrain models, the creation of prototypes, and the parametric generation of landscape systems. Use laser scanner, Google Earth, and computer numerical control technology to build digital model and numerical control model, use numerical control machining model to simulate the environment for testing, and finally use digital model and numerical control model to express accurately. This method not only focuses on "parametric design" but also needs to integrate "parametric construction" [4]. Lyver and O'Neal pointed out that elements such as the center of the city, walls, squares, and parks can no longer be defined rigidly as the representatives of contemporary cities. The city should be regarded as a nonstatic process of continuous development, it is the combination of various spaces, the construction of logic, and the self-circulation of the system, it is a complicated flow network, rather than various rigid spatial layouts and functional divisions, the process is called fluid urbanism, and this concept is also used in subsequent projects [5]. Kola and Liarokapis use parametric tools to understand the structure and function of organisms and to simulate the operation of biological systems; this method is related to the design of landscape architecture; that is, the flow of elements and energy in the design site, and the Energy transfer and supply in living organisms, as well as physicochemical reactions, converting the specific problems of the site into ecological related theories and establishing a "special" landscape system can be called "biomimetic" design in the field of landscape architecture [6]. Bergues-Pupo et al. used parametric tools (peg office of landscape+ architecture) to conduct a research project called "Edaphic Effects" (Edaphic Effects); the simulations then form "unit prototypes" and build them; eventually, it becomes a landscape system with parametric logical aesthetic form. It can be seen that foreign designers have begun to try to apply the concept of "parametric design" to specific practical projects from different perspectives, and the field of parametric landscape architecture planning and design has also made progress [7].

In order to solve the problems of low-resolution images and traditional artworks, the author created a three-dimensional virtual landscape rendering system. Using these methods to display the garden landscape makes it easier to plan the garden landscape, improves the technological process of the garden landscape, and provides more support for future construction.

3. Research Methods

3.1. GIS Technology. GIS (geographic information system) is a computer system based on geospatial databases that was slowly developed in the middle and late 20th century; it is an interdisciplinary subject interspersed in earth science, information science, and space science, based on geospatial database; use computer systems to collect, manage, store, process, analyze, and build geographic models of spatial data; provide dynamic geographic information based on space; and provide technical support for geographic research and decision-making services.

Nowadays, GIS has gradually penetrated into various industries, such as surveying and mapping, agriculture, environmental protection, transportation, urban construction, and public security. When GIS conducts spatial analysis, it associates its spatial position with attribute relationship, and the final result also shows the three-dimensional relationship of space. GIS software can process the data obtained by remote sensing technology and GPS and build a corresponding database; the processed data are all geocoded, which is also the difference between GIS and other computer systems. Geographic information system is a tool discipline. In landscape architecture planning and design, GIS software can be introduced into the design, and the advantages of GIS can be fully utilized to conduct data query analysis, location analysis, topographic and landform analysis, hydrological analysis, trend analysis, simulation analysis, etc.

GIS software is essentially the work of data processing and at the same time has the ability to centrally process scattered data; the existing data of some large urban landscape sites are relatively complex and scattered; the integration, management, maintenance, storage, database construction, and data analysis and processing of scattered data through GIS software greatly improve the work efficiency of designers.

GIS can draw models for existing data in three-dimensional space; in the past landscape architecture planning and design, designers need to familiarize themselves with local landscapes and collect data through on-site exploration methods; when the volume of the landscape site is large, it will inevitably greatly reduce the work efficiency of the designers. The generation of GIS solves this problem very well; the site data stored in the computer can be reflected by means of surface effects and scene display; the modeling method in GIS technology can be combined with virtual reality technology at the same time and visually and diversely express the scenes to be designed or evaluated, and then designers can generate 3D models through GIS for further analysis, and then they can carry out related planning and follow-up management and maintenance work. Later, using the GIS database, it is also possible to analyze and integrate relevant data in a small area and finally build a data model of the entire urban landscape through the method of data connection, so as to classify, query, and manage the data in the future.

3.2. Hardware Design of 3D Virtual Imaging System

3.2.1. Hardware Framework Design. According to the understanding of virtual imaging technology, the hardware of 3D virtual imaging system in garden landscape design is designed; the specific design framework is shown in Figure 1.

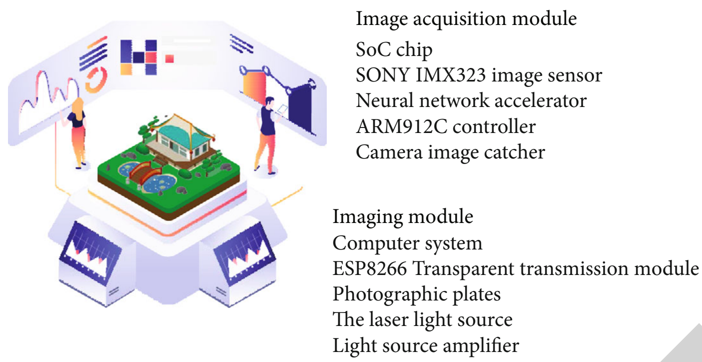

Figure 1: Hardware frame diagram of 3D virtual imaging system.

The hardware of the system is set as an image acquisition device and a virtual imaging device. Image collectors include camera capturers, microcontrollers, image sensors, image controllers, and neural network accelerators [8, 9]. The virtual imaging device consists of a computer, a projection device, a photoreceptor, a laser amplifier, and an ESP8266 transparent transmission module.

3.2.2. Image Grabber Design. When printing large images, most of them use a single-chip computer as the main source of image printing. The device detects the presence of a 3D virtual imaging system in the landscape design select SoC chip as the first image capture [10]. To support graphics, select the SONYIMX323 image sensor, camera device, ARM912C controller, neural network accelerator, and database driven controller. The image sensor was configured and designed using the SCCB protocol. A schematic part of the imaging equipment is shown in Figure 2.

The picture in the garden design is collected by a circuit consisting of an amplifier and some resistors. All current is set to 3.7 V, and the standard current is used to control the graphics, which can ensure that the high current does not affect the graphics. To increase the voltage safety, an electric stabilizer is added to the original circuit, and this function ensures the safety of the image capture.

3.2.3. Design of Virtual Imaging Equipment. Using three-dimensional light to convey the details of the garden landscape design requires air and light design and control room design.

The benefits of garden design are integrated and computer-generated, and the finished image is made using holographic projection technology. The laser is used to illuminate virtual images, and the light emitted by the laser beam is divided into two segments: one part is directed directly at the photosensitive film; the other is refracted by photosensitive film by light amplifier, and light is led by photosensitive film.

In a virtual video, ESP8266 is used to control the transparent transmission, and by using this technology, the finished image is sent to the transparent transmission by the computer; the module operates the secondary and then operates the simulated transmission; the emitted image is sent by the laser to a photosensitive form, completing the virtual image.

3.3. 3D Virtual Imaging System Software Design Software. The developer includes an original image search module, an image generation module, and a virtual rendering module.

3.3.1. Detection Module. When creating virtual images of a garden landscape, it is necessary to take pictures first, and unlike the first shot, 3D virtual imaging technology requires the use of camera design images to describe about virtual objects, and get simulation images based on drawings [11].

In order to ensure the clarity of the image, noise reduction processing is performed on the image. Set the image acquisition sample; the specific formula is as follows:

$$Y = X + N. \quad (1)$$

In the formula, X is the first figure; Y represents the tone of the sample after collection; N is the approximate volume of the output layer. Graphic models are arranged in a matrix using a convolutional neural network [12]. Let the popular image be matrix f and the main matrix be g. The graphics have been processed to prevent scattering in the network. The drawing is done by rotation patterns, and the special patterns are as follows:

$$(f^* g)(1,1) = \sum_{k=0}^{m} \sum_{h=0}^{n} f(h,k)h(n-h,m-k). \quad (2)$$

By using inactivated neurons and parameters for image reconstruction and outputting the residual image, the output image data is reproduced.

3.3.2. The Image Making Module. The image making module collects images through the above parts and processes the collected images uniformly [13]. Through the Moravec algorithm, the image is subjected to the pixel point grayscale change operation, and the depth calculation is performed, and the pixel point is set to (x, y); then the

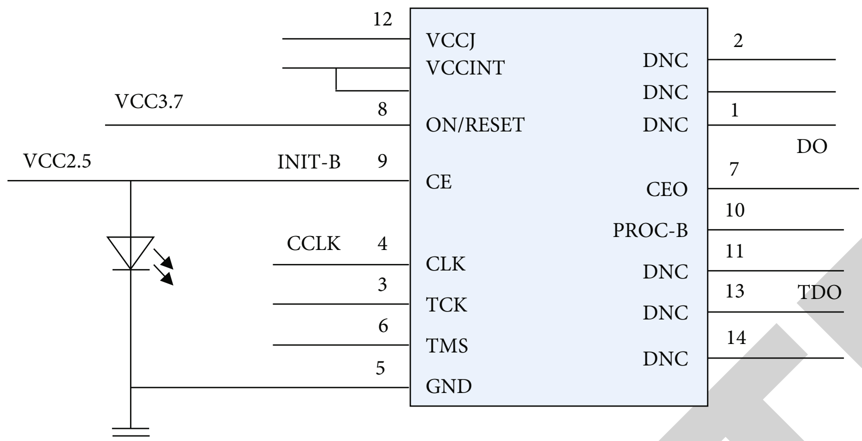

Figure 2: Part of the circuit of the acquisition hardware device.

square sum of the grayscale differences in the four directions is as follows:

$$\begin{cases} Q_1 = \sum_{i=-k}^{k=1} \left(g_{x+i} - g_{x+i+1,y} \right)^2, \\ Q_2 = \sum_{i=-k}^{k=1} \left(g_{x+i,y+i} - g_{x+i+1,y+1} \right)^2, \\ Q_3 = \sum_{i=-k}^{k=1} \left(g_{x,y+i} - g_{x,y+i+1} \right)^2, \\ Q_4 = \sum_{i=-k}^{k=1} \left(g_{x+i,y-i} - g_{x+i+1,y-i-1} \right)^2. \end{cases} \quad (3)$$

The high value of the point measurement is used as the main point, the window frame is set, and the highest value of the equations of the squares of the different grayscale is obtained. The image collection by deleting the content feature was achieved, and the images were taken as special to ensure the accuracy of the image.

3.3.3. Virtual Imaging Module. Based on the above model, the images are printed and processed, and the finished images are passed through virtual work to become a three-dimensional virtual representation. Based on the hardware design of 3D virtual imaging, the computer is used to control the final image displayed during the virtual image processing, and the virtual language can be used [14, 15]. The output image is passed through a combination of photoreceptors and amplifiers to realize the virtual image. Currently, the design of a 3D virtual vision system in the landscape design of the park has been completed.

4. Results Analysis

In order to ensure the scientificity of the 3D virtual imaging system in the garden landscape design, a comparison test was carried out with the original virtual imaging system to test the image clarity of the 3D virtual imaging system [16].

Table 1: Parameters of simulation experiment equipment.

Equipment	Configure	Parameter
Server	Intel Xeon ES-2620 2.0 GHz	20 GB RAM
Database	SQL Server 2019 database	—
Interface control	DIV+CSS	2 GB RAM
Operating system	Windows Server 2018	—
Use the web	IE8.0 browser	—
Internet speed	8 M Ethernet	—
Host	Windows 10 system	—

4.1. Experiment Preparation Process. To ensure the accuracy of the experiment, some landscape design images have been selected for visualization, and virtual visualization and design techniques have been used in virtual visualization, and the sharpness of the image arose. The test equipment was set up as shown in Table 1 [17]. With the help of the above parameters, a virtual representation of the garden landscape is made. In the experiment, a total of 20 landscape parks were selected, a total of 3 virtual images were taken, and the brilliance was counted and analyzed.

4.2. Analysis of Experimental Results. The author's design is represented by system 1, and the original system is represented by system 2 in Tables 2–4 [18]. The data in the table show that the resolution of the virtual imaging system developed by the author is usually between 85% and 90%, and the resolution of the original imaging system is usually between 82% and 85%. It is obvious that the actual virtual images created by the author are higher than the original virtual imaging system. It can be seen that the author model of the virtual imaging system has achieved the benefits of visual acuity. Based on the above results, after using the virtual measuring machine developed by the author in the landscape design, its visibility is much higher than the industry average [19]. The virtual rendering system developed by the author can show the landscape of the garden in a simple and direct way. The three-dimensional virtual visualization system designed by the author is perfect for garden design.

Table 2: Comparison table between the original system and the system clarity of the first test.

Picture label	Sharpness of the first trial (%)	
	System 1	System 2
1	89.3	82.6
2	89.7	83.6
3	89.1	82.5
4	89	84.9
5	90.3	83.3
6	88.1	82.9
7	90	83.1
8	88.3	82
9	88.4	82
10	89.7	83.9
11	89.3	83.9
12	88	82.3
13	89.6	84.6
14	89.4	82.7
15	88.3	82.9
16	90.6	83.2
17	90.8	84.6
18	90.6	83.9
19	89.3	82.6
20	89.5	84.2

Table 3: Comparison table between the original system and the system clarity of the second test.

Picture label	Second trial clarity (%)	
	System 1	System 2
1	89.3	82.8
2	85	83.4
3	88.6	83
4	87.1	83.7
5	89	83.7
6	89.1	84
7	87.5	85
8	89.4	84.1
9	85	84.5
10	88.5	85
11	85.3	83.5
12	89.8	83.4
13	88.9	83.8
14	86.4	83.4
15	88.3	82.6
16	89.3	83.7
17	89.7	83.6
18	85.4	82.2
19	86.3	82.6
20	85	82.2

Table 4: The comparison table of the original system and the system clarity of the third test.

Picture label	3rd trial clarity (%)	
	System 1	System 2
1	90.2	83.9
2	88.7	83.6
3	88	82.1
4	88.5	83.3
5	90.2	83.2
6	90.6	84.1
7	90.1	85
8	90.5	82.4
9	89.6	83.9
10	88.3	82.5
11	90.4	84.9
12	90.9	83.1
13	90.3	84.6
14	90.3	83.4
15	90.5	82.7
16	88.9	83
17	90.5	84
18	90.2	83
19	88.2	82.2
20	90.2	84.5

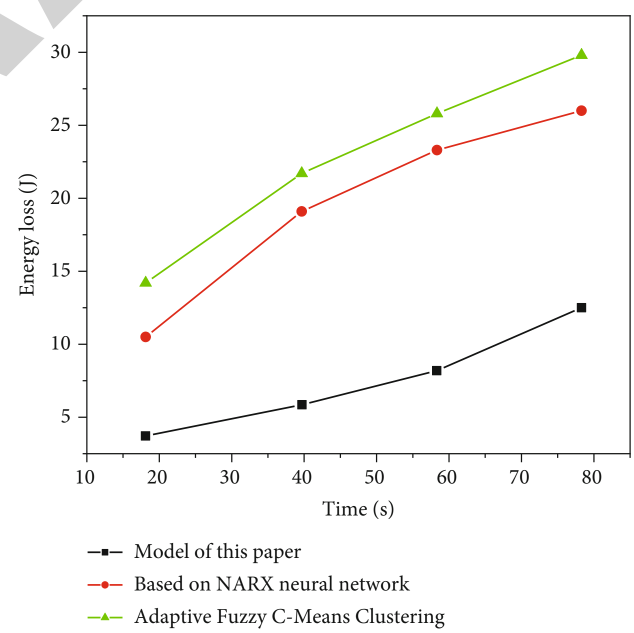

Figure 3: Comparison of energy consumption of three methods.

4.3. Energy Consumption Analysis. For data storage and processing, the author uses a real-world number to reduce the cost of data retention and communication costs between nodes. The different groups of data are represented by a combination of components, which makes data sharing more efficient [20]. In this experiment, the remote sensing sensor network of the landscape area consisted of 110 nodes, and the nodes were divided into an area of $110\,\text{m} \times 110\,\text{m}$. Figure 3 shows a comparison of the data transmissions used between the three different models.

From the analysis of Figure 3, it can be seen that the energy consumption of the fusion process material of the sample is higher than that of the sample. This is because there are always two heads sending data in each model group, which makes data transmission and processing more efficient [21]. By using a genetic algorithm, the model cannot only improve the accuracy of data integration and storage but also reduce data retrieval, reduce the use of fire electricity, and improve the performance of data integration in the landscape design process [22–26].

5. Conclusion

With the continuous popularization of 3D virtual imaging technology in China, this technology is applied in all walks of life, through 3D virtual imaging of garden landscapes, deficiencies in garden design can be discovered in time and corrected. By using this technology to visualize the virtual landscape, it is guaranteed that people can fully perceive the designer's feeling. Based on the current virtual imaging technology, the research on imaging technology should be continuously strengthened, and the scientificity and feasibility of the equipment should be continuously improved, so as to apply this technology more proficiently.

Data Availability

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

Conflicts of Interest

The author declares that there are no conflicts of interest.

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