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Research Article

Application of Virtual Reality Technology in the Restoration of Architectural Decoration Space

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This paper investigates the application method of architectural decoration space transformation construction, constructs the architectural decoration model based on virtual reality technology, realizes the three-dimensional display of architectural decoration space structure, and optimizes the construction of architectural decoration space transformations in order to solve the unreasonable problem of architectural decoration space combined with virtual reality technology. The experimental results show that using virtual reality technology in the construction of architectural decoration space transformation can better ensure the rationality of building structure and improve the construction efficiency of architectural decoration space transformation, thereby simplifying the space transformation process and improving space transformation quality.

1. Introduction

In the construction field, with the development of physical experiential safety education and training, the application of virtual reality (VR) technology has also been developed. The application of virtual reality (VR) technology in construction safety education and training is to use computers to generate a simulation environment for various hazards and frequent accidents on the construction site and adopt interactive three-dimensional dynamic scene and system simulation of physical behavior. Immerse the wearers in the virtual reality environment, immerse them in “real” construction casualty accident scenes such as falling from height and object strike through the immersion of VR world, truly feel the harm caused by illegal operation, and improve the risk, safety awareness, and the importance of accident prevention [1]. Virtual reality is used in the construction of safety teaching and training begin with the use of BIM technology. To begin, we should use BIM technology to create a 3D scene model based on the actual construction site scene, import the scene model into the VR program engine, collaborate with the engine’s rendering technology to create a realistic VR scene environment, and then develop the subsequent scene interaction program based on the safety experience requirements [2]. The study and implementation of virtual reality technology in the area of architectural decorating has also become a new trend. VR design based on the classic three-dimensional model of architectural decorating provides various application concepts for the architectural decoration business. Due to the application of architectural decorating industry and the core features of three-dimensional model, it also has comparable display techniques and characteristics throughout the application process. The field of architectural decoration engineering generally includes conventional projects such as ordinary home decoration projects, real estate model room projects, public building decoration projects, and building facade decoration and renewal projects, among which ordinary home decoration projects are the most common projects [3]. Taking the application of VR design in ordinary home decoration design projects as an example, we discuss the application of VR design based on the three-dimensional model of traditional architectural decoration.

2. Reconstruction Construction Method of Architectural Decoration Space Based on Virtual Reality Technology

2.1. Architectural Decoration Model Based on Virtual Reality Technology. VR technology uses computers to simulate a seemingly real virtual environment and uses a variety of sensing devices to bring visual, auditory, tactile, and other sensory experiences to the experiencer, so as to create a real experience effect, that is, the scenes and characters seen, sounds heard, and things touched by the experiencer are simulated. It just substitutes people's ideology into a virtual world (Figure 1).

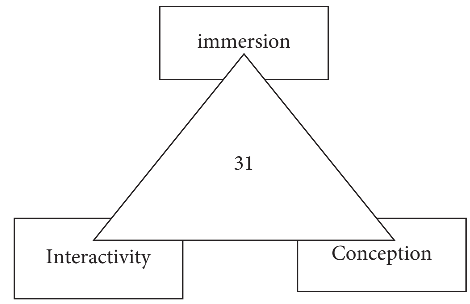

Figure 1: Features of virtual reality.

The virtual reality system refers to the various virtual training environments in which the logical structure model of the system is constructed by using virtual reality technology in the computer system [4]. Users control the virtual instrument and analyze data using the mouse and keyboard, precisely like they would in a real training environment, thanks to the modular and hierarchical design concept. The virtual reality system is primarily based on the real training environment in order to create a virtual scene that is similar to or better than the real environment, which includes the corresponding training room environment, relevant training instruments and equipment, training objects, and training information resources [5]. The primary goal of the training process is to accomplish numerous planned training projects for the operation of virtual objects. The learning or training impact gained is comparable to, if not superior to, that acquired in the actual world. A virtual reality system consists of a host system, a scene display system, and VR interface equipment from the standpoint of composition. A virtual reality system, in terms of function, is an interactive environment for producing and leading simulation training [6]. It is composed of simulation programs, training units, tools, and references. Users can expand the training room by adding new materials, establishing new training, and transforming them into hypertext files (Figure 2).

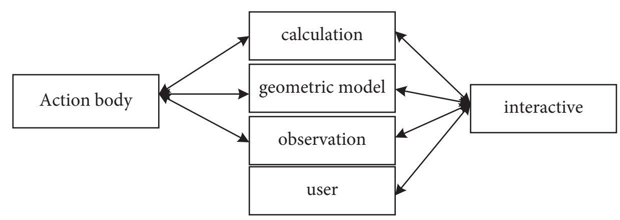

Figure 2: Virtual reality system model.

immersive means that experiments bring in the virtual reality with the use of VR device. It will helps in making the experimenter completely immerse with all round visual effects [7]. This is the core feature of the system. Interactivity means that when the experimenter uses peripherals such as handles and gloves to interact with objects in the immersed virtual world, he does not just stay in the visual feeling but integrates the experimenter's behavior into the scene. The user experience is improved, the immersion is enhanced, and the conception refers to the experiencer's profound comprehension of the virtual environment in which he or she is submerged. This knowledge will not occur in reality, but the immersive virtual environment's guiding allows the experiencer to imagine outcomes that will not occur in reality, for example, fear of falling from a great height [8]. It may also turn a physical security experience hall into a realistic VR scenario for a virtual reality encounter. The "4 m" theory further reveals the deep causes in the accident chain reaction theory, comprising man, machine, media, and management, by taking into account the features of the construction industry and calculating the inciting elements of various sorts of accidents. Based on this theory, the following framework for analyzing the causes of construction accidents is designed. The causes within the framework widely exist in construction accidents, but not every event contains all factors. The cause elements to be displayed in the construction VR scene will be selected according to the selected accident type, educated object, and development difficulty [5]. The appropriate expression form and insertion time are selected according to the scene event process design (Figure 3).

In the VR scene of construction accidents, people are considered the main body. The psychology, actions, and lines of the characters in the scene guide the scene. In the cause analysis, the causes related to operators include physiological factors, psychological factors, and occupational factors, as well as human operation behavior [9]. The physiological factors that may cause accidents for construction operators are mainly attributed to sick operation, fatigue operation, and disabled operation that does not meet the requirements of operation physical examination. Professional factors refer to interpersonal communication and tacit cooperation among many people. However, in the VR experience scene, the experimenter experiences from the first perspective of the protagonist and does not give the performance of physiological factors, nor does it have the process of cooperation and interaction with others [10]. Physiological and professional variables are not the scene's expressive content, and construction workers' psychological elements have a greater influence on the incidence of accidents. Long-term construction workers face several challenges, including exhaustion, poor pay, low social standing, and family pressure. Long-term negative emotion buildup impacts operators' working attitudes, resulting in slowdowns, discontent, and resistance. New workers are often

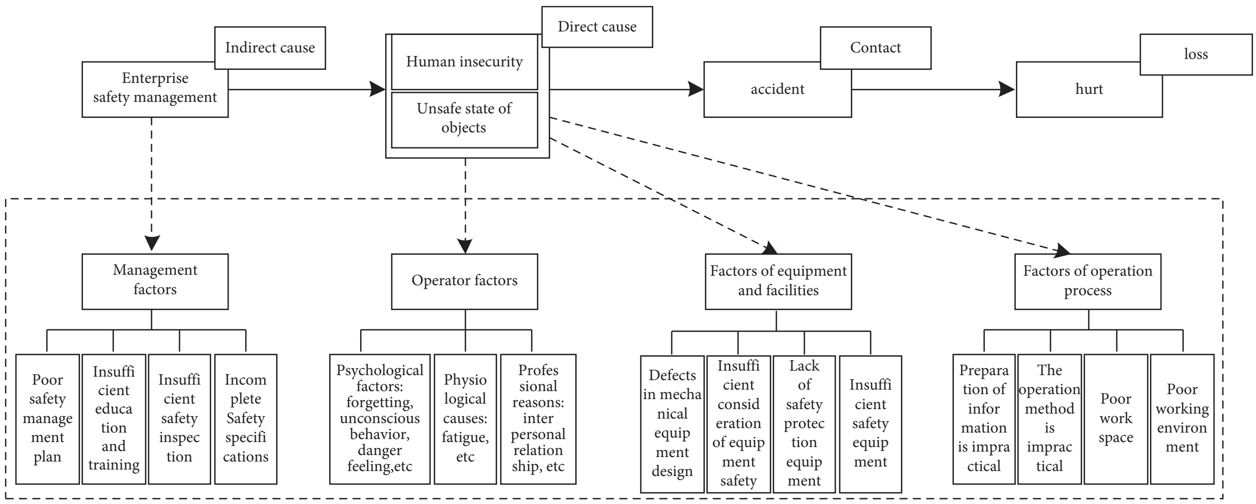

Figure 3: Analysis framework of causes of construction accidents.

youthful, inquisitive, and willing to take risks. Due to their lack of job experience, their positive attitude has become the driving force behind unsafe operations [11]. Employees also have flaws in their own character. They have conflicts with coworkers or leaders as a result of their narrowness, and they work with vigour. It is also the premonition of the accident, whether it is negative emotion, intellectual danger emotion, or exciting emotion. The causes of psychological factors can be introduced in combination with the identity of the protagonist in the opening report in the VR scene to pave the way for hidden dangers. Based on the analysis of the elements of the accident process based on the principle of safety science, the occurrence of casualty accident is not an isolated event but the result of a series of cause events [12]. The identity of the person in complete accident process is based on the place, environment, as well as on the event of unsafe objects and behaviors. There is a necessary connection between the process of the accident and the result of the accident. When an accident occurs, the two tracks of human unsafe behavior and material unsafe state intersect in a certain time and space in their respective development process, resulting in an accident, following the accident track intersection theory (Figure 4).

In the VR scene design of construction accidents, the accident cause theory and trajectory intersection theory guide the design of event process elements, making it more scientific, rigorous, hierarchical, and focused [13]. At the same time, the design of the elements of the accident process should meet the requirements of the drama structure principle for the display of each structure, reasonably arrange the cause events, make the whole scene more authentic and ornamental, not force the accident process, and not rigidly bring the accident results.

2.2. Optimization of Construction Transformation Process of Architectural Decoration Space. The on-site display is based on the construction site, and the virtual construction sites such as housing construction, subway structure, tunnel excavation, and municipal engineering can be selected according to the requirements of the developer [14]. The building site may use reference artefacts to depict the natural environment, such as an anemometer to depict windy weather and puddles and rainfall to depict heavy rain. From a first-person viewpoint, it is determined whether to add environmental aspects to the virtual location. The experimenter must be provided a role orientation that includes the name of the role, the sort of work that will be performed, and the type of work that will be performed [15]. The introduction of roles is mostly communicated to the experimenter via narrative or interaction with other persons. In addition to the necessary introduction, it is possible to introduce the characters' emotional state and work experience to demonstrate psychological factors; it is also possible to introduce whether there are perfect operation procedures such as operation disclosure, operation inspection, and operation approval to explain the reasons and elements of management (Table 1).

The development stage is a stage in which the hidden danger is gradually obvious and gradually moves towards the accident, including three lens displays of specific work space details and equipment and object operation process (Table 2).

The experimenter will formally enter the operation area through guidance and select the appropriate operation space according to the type and elements of the accident, such as high-altitude confined space, plant, and so on [16]. The layout of work space, combined with perspective locking and close-up lens, can show the elements of environmental reasons. The preparation of materials and the display of work space are carried out simultaneously, but they are essentially different. Equipment materials are props with display, operable and movable properties. It can show design defects, equipment defects, protection defects, and unsafe configuration, that is, the unsafe state of objects. At this time, the unsafe state is a foreshadowing, which belongs to the display of indirect causes [17]. The unsafe state of the object in the direct cause will be displayed in the climax scene. Close-up

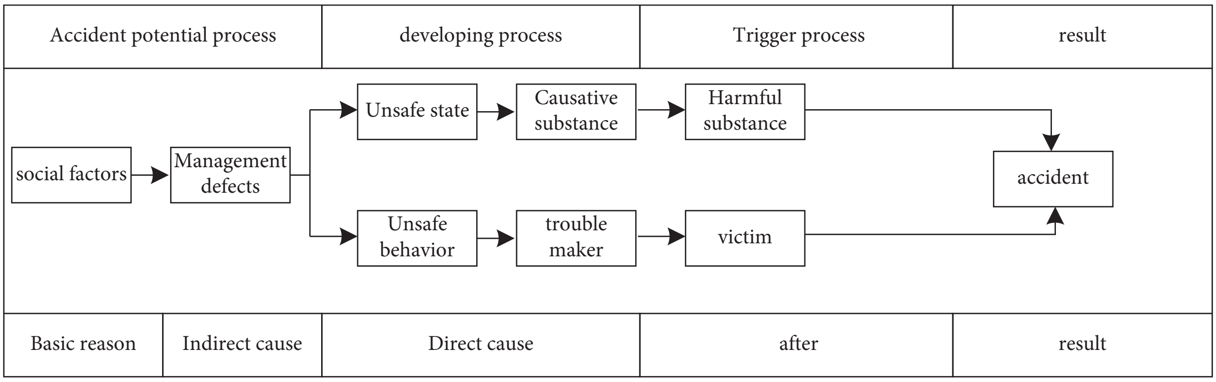

Figure 4: Building trajectory crossing accident model.

Table 1: Scenario design.

Stage	Content	Form	Displayable cause elements
Beginning	Live display Role positioning Engage in homework	Virtual scene Narrator, dialogue	Environmental elements Psychological factor Management elements

Table 2: Development scenario design.

Stage	Content	Form of expression	Displayable cause elements
Development	Workspace display Equipment and material display Operation process display	Visual locking, close-up Visual locking, VR interaction	Environmental factors Elements of objects Elements of behavior cause and object

lenses may be utilized in the experiencer's line of sight to emphasize the protagonist's relevant operating activities in the development scene and interactions with equipment or materials. The interactive lens incorporates both human and object movements that are intertwined. When the protagonist is getting ready to approach the building site, for example, there are two options: wearing safety helmets or not wearing safety helmets, which relate to whether the site entry gate is open or not. As a result, the supporting behavior cause elements and material cause elements may be seen via the operation process lens in the development scene. The stage when people's risky conduct meets with the unsafe state track of things [18] is the culminating scene of the VR experience of a construction accident. At this point, the genuine accident will be revealed via the paving of risky starting and development cause elements. A close-up of the object's dangerous condition is shown here. The procedure may include the display of the object's status as well as the object's activity. All the people with unsafe behavior are considered as the virtual interactive according to the handling of operator. The experimenter works as the protagonist to trigger the climax of the accident. What attracts the experimenter is the display of the accident injury, which is also the most impressive part of the experimenter. Select the appropriate injury mode according to the type of accident, so that the experiencer can feel the impact of accident and disaster and improve their safety awareness [19]. The scene of the bureau is the existence of the finishing touch. It tells the injury caused by the accident, cause analysis, preventive measures for such accidents, and safety slogans and aphorisms in the form of subtitles and narration. For the sake of your life and the happiness of your family, please pay attention to safe operation, and so on (Table 3).

Using distributed virtual reality system, users can conduct real-time interactive training operation through mouse and keyboard (Table 4).

From the aspects of immersion, interaction, conception, cost, and technical difficulty of immersive, distributed, and augmented reality and desktop virtual reality systems, the analysis is as follows: the interactive equipment such as data gloves, helmet mounted displays, and three-dimensional scanners used in immersive and augmented reality virtual reality systems are expensive, which makes many schools shy away from virtual implementation training. Desktop virtual reality system DVR is easy to implement and low cost, but its immersion is poor. Distributed virtual reality system has the characteristics of network operation, nonlinear operation, and small volume. It is widely used in education, architectural design, manufacturing, and other fields. It is the development of immersive virtual reality system, which is equivalent to connecting immersive virtual reality systems distributed in different places through the network, so as to achieve the rational utilization of resources.

2.3. Realization of Reconstruction Construction of Architectural Decoration Space. In order to experience the interactivity and practicability of building construction training

Table 3: Scene design of building construction process.

Stage	Content	Form of expression	Displayable cause elements
Climax	Accident trigger plot	Scene close-up and interaction	Behavioral elements and material elements
	Injury process display	Visual design	—
Ending	Teach	Narrator, letter	—

Table 4: Comparison of immersive, distributed, and augmented reality and desktop virtual reality systems.

Comparison item	Immersion	Interactivity	Conception	Cost	Technical difficulty
Immersive	Strong	Center	Strong	Expensive	More
Distributed	Strong	Strong	Center	High	Center
Augmented reality	Center	Center	Strong	High	Center
Desktop type	Difference	Center	Center	Low	Less

virtual system, we adopt the idea of modularization. The system is mainly divided into two modules: material resource library and virtual training room, as shown in Figure 5. During the construction of material library of resource library, a large number of construction cases from all over the country are collected according to the characteristics of building construction, including building materials, structure and structure, detection and test, measuring instruments, construction machines and equipment, scaffolding, construction technology, project management cases, building earthquake damage, and reinforcement. The content resource library of current building regulations and technical standards mainly includes text resources, picture resources, animation resources, and video resources. The building construction material resources may be searched via retrieval by the resource material library, which can be done in whole or by category. The system's main development module is the virtual training room, which includes masonry structure construction simulation, masonry structure quality detection, frame structure construction simulation, frame structure quality detection, steel structure construction simulation, steel structure quality detection, and steel structure quality detection. Single-layer plant construction simulation and single-layer plant quality inspection are two of the eight modules.

When analyzing the problem through the AHP method, after determining the understanding problem, a multi-level hierarchical structure model is established according to the relationship between the elements in the research object. According to the analysis and understanding of the problem, the logical relationship between the factors contained in the problem is sorted out, and the model is layered according to the relationship of different factors. The model generally includes three levels: criterion level, target level, and sub-criterion level. Secondly, a judgment matrix for the relative importance of the elements in the same layer of the elements in the upper layer is constructed. The determination of criterion layer and scheme layer is based on the establishment of target layer. When analyzing with the AHP analysis method, it is necessary to compare and analyze the factors between different levels. The factors of each level are obtained through discussion and analysis by experts at the upper level. When establishing the structural model, there must be a certain logic between different levels. The specific hierarchy model is shown in Figure 6.

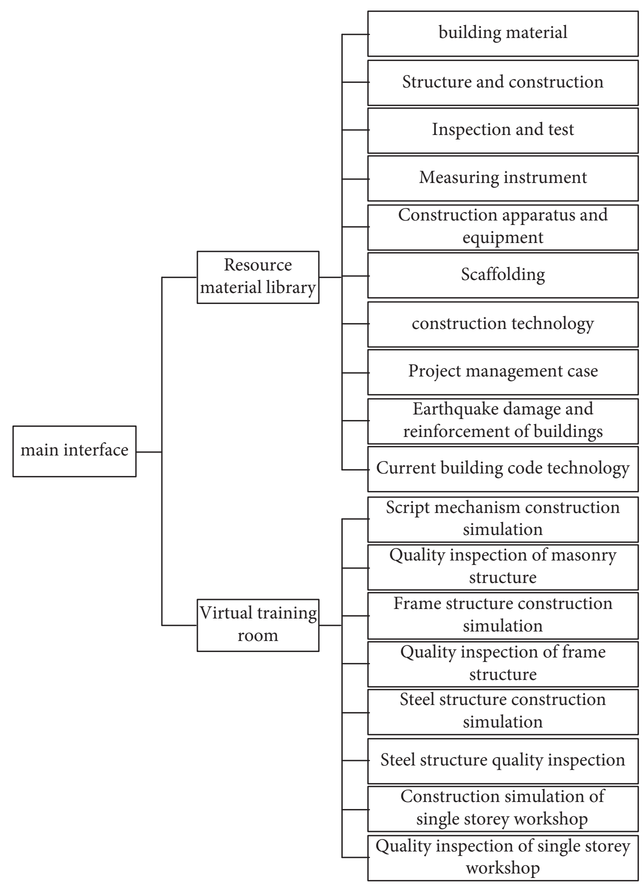

Figure 5: Framework diagram of building construction training virtual system.

The construction of judgment matrix is based on the hierarchical structure model to compare the factors of the index layer and establish the judgment matrix. The establishment of judgment matrix is a key step in the AHP analysis method. Assuming that a judgment problem has N levels $(P_1, P_2, P_3, \ldots, P_a)$, the matrix is obtained according to the judgment matrix (Table 5).

Through the above matrix, it is difficult to determine the importance of each element in order to make a standard quantitative sum of more complex qualitative problems. Therefore, generally speaking, in order to solve this problem, the AHP method uses the 1–9 scale method to compare the

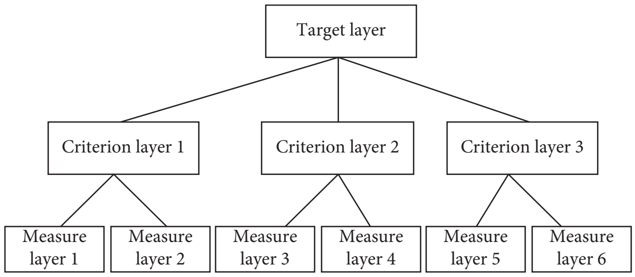

Figure 6: Hierarchical structure model of building construction evaluation.

Table 5: 1–9 scale indicators.

Scale	Definition and description
1	Both are equally important
3	One element is slightly more important than another
5	One element is obviously more important than another
7	One element is much more important than another
9	One element is more important than another
2,4,6,8	Indicates the scale when the above two need to be disassembled
$1/b_{\text{ij}}$	Inverse comparison of two elements

elements. b_{ij} in the judgment matrix shall meet the following conditions:

$$\begin{cases} h = \dfrac{1}{b_{\text{ij}}}, \\ R = \dfrac{b_{\text{ij}}}{n - b_{\text{ij}}}, \end{cases} \tag{1}$$

where n in the judgment matrix is determined after several studies based on the research and discussion of different experts and the experience of system analysts. Therefore, it is necessary to maintain the consistency of judgment when using the AHP method for analysis. From the above matrix, as long as B meets the above two relations, it can be explained that the judgment matrix is consistent. The main indicators of judgment matrix consistency are

$$C.I. = \frac{\lambda_{\max} - n}{n - 1}. \tag{2}$$

In formula (2), the greater the $C.I.$ value, the greater the degree of deviation from consistency of the judgment matrix, and vice versa. In general, the more the layers of the judgment matrix (i.e., greater $\lambda_{\max}$), the greater the possibility of deviation from consistency, and vice versa. Virtual construction refers to the use of virtual reality technology to the building process and the simulation of internal force analysis. In essence, it is the computer virtual world's high-resolution simulation of the real-world building process. Comprehensively sort out various information parameters such as artificial materials, logistics, and equipment in large-scale construction activities using the computer's powerful memory and storage function, convert all information parameters into computer data, and visually display these kinds of digitized information so that the observer can more intuitively find and solve construction technical problems. The ultimate goal of this virtual construction is to lower construction costs, minimize construction risk, shorten the construction cycle while maintaining construction safety, ensure the efficacy of construction decision making, and improve control over the entire construction operating mode. In the long term, since the whole virtual building process consumes no natural resources or energy, it is very beneficial for the construction industry to achieve its objective of being a green business (Figure 7).

After the basic parameters are determined, whether the static geometric model is driven by MAXscript language or the standard action library is modeled by other programming languages in Virtools. All the keys of technology are considered as the main part for solving the dat- based modeling for the realization of data. Regular geometry can be described by concise mathematical equations, such as cylinder, vertebral body, cuboid, and so on. It can be used to model common components such as columns, beams, plates, and so on. Define the coordinates of any point in the space as $(0, h]$, and the parametric expression equation (not unique) of the three-dimensional rectangle is

$$\begin{cases} x^2 + z^2 \le R^2, \\ y \in (0, h]. \end{cases} \tag{3}$$

As above, the coordinates of any point are defined as (x, y, z), and its mathematical expression (not unique) is

$$\begin{cases} x \in (0, 1], \\ y \in (0, h], \\ z \in (0, R]. \end{cases} \tag{4}$$

The basic motion unit is a function of the relative time of the position and attitude of an entity, which can be expressed as

$$(P_t, O_t) = m(P_0, O_0, t), t \in [o, T], \tag{5}$$

where $P_{i,0}$ and $O_{i,0}$ are the position and attitude at time $\Delta_{i,t}$. The motion of a unit with reference only to the overall motion of the assembly can be described by the following formula:

$$\left(P_{i,t}, O_{i,t}\right) = \text{mE}\ (P_0, O_0, t), m_i\left(P_{i,0}, O_{i,0}, t - \Delta_{i,t}\right), \quad t \in \left[\Delta_{i,E}, T_i + \Delta_{i,E}\right], \tag{6}$$

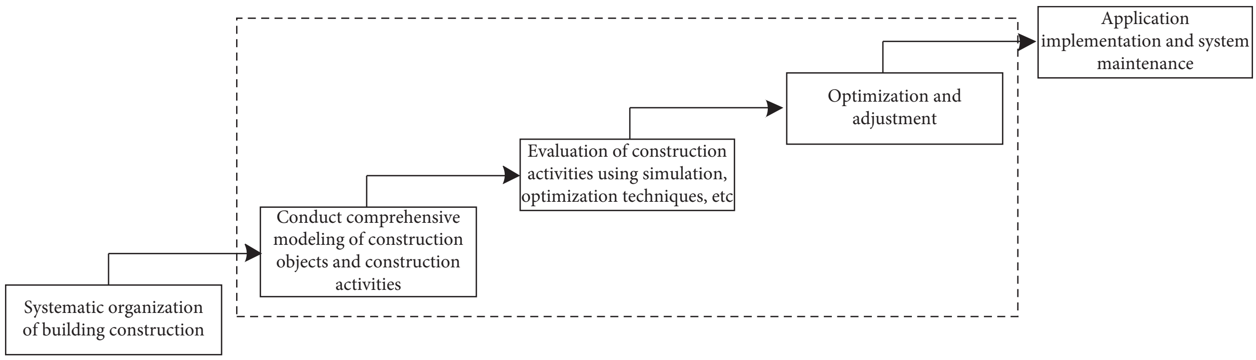

FIGURE 7: Static geometric model of building decoration space construction and transformation.

where $\Delta_{i,E}$ is the delay relative to the overall motion. For a unit T_i with another unit as a reference, its motion is described as

$$\left(P_{i,t}, O_{i,t}\right) = \mathrm{mE}\left(P_{f,t}, O_{R,t}\right), m_1\left(P_{i,0}, O_{i,0}, t - \Delta_i\right), \quad t \in \left[\Delta_{i,R_1}, T_i + \Delta_{i,R}\right], \tag{7}$$

where $(P_{E,0}, O_{E,0}, t - \delta_{E,R})$ is the state of the reference unit at time t and m_E is the time delay of movement relative to the reference unit. When the motion of a group is triggered by the motion state of other combinations, the motion of the combination can be described as

$$P_{E,t}, O_{E,t} = \mathrm{mE}\left(P_{E,0}, O_{E,0}, t - \delta_{E,R}\right), \tag{8}$$

where $\delta_{E,R}$ is the time value satisfying a predefined condition, that is, when $t - \delta_{E,R}$, then

$$h\left(P_{R,t} O_{R,t}\right) = 0. \tag{9}$$

The combination of virtual simulation and mechanical analysis is divided into two parts: crawler hoisting stability analysis and component strength, stiffness, and stability analysis. In the stability analysis of crawler hoisting, the mechanical calculation model can obtain the safety factor K. When the elevation reaches a certain degree and the calculation is less than the safety factor, an alarm will be given. The crawler crane must then be modified and raised once again in order to calculate and detect the safety. This may be used to direct the operation scheme so that the operators can "immersively" command the safe functioning of the on-site mechanical drivers and finish the building scheme preview. The process of structural internal force generation and deformation change during construction is very complicated for big complex steel structures. The following are the characteristics of a really safe structure. First, the shape of the actual built building should conform to architectural design standards, and even if deviation is necessary, it should be kept within a manageable range. Second, the change in stress and strain should fulfil the criteria throughout the building and installation process, and the change in internal force at the time of installation is especially significant. We examine the participants' stress levels in this section. We may assess the stress of members at any point throughout the strength, stiffness, and stability examination of members. The entire force, for example, may be calculated after the crawler crane has completed the whole raising. The virtual system first creates the model data, which are then read by the force analysis module for mechanical analysis to determine the component's maximum and lowest stress, maximum displacement, and stability. After analyzing these data, we can take the data requirements as the standard to ensure that the lifting and installation process of components can be carried out safely, and the stress change and strain amplitude at the moment of component installation can also meet the requirements of design state by virtual prediction in advance.

3. Analysis of Experimental Results

Revit has built-in graphics renderer. In order to show the effect more truly, the authors use Atlantis for post-rendering of the model. In this paper, the existing buildings are modeled and reconstructed through Revit. We use Atlantis for post-rendering, import the rendered model into steam VR, and use VR helmet to watch the reconstruction scheme (Table 6).

50 rooms with virtual soft decoration design and 50 rooms with traditional design methods are selected. In order to illustrate the authenticity of the experiment, 3dmax tool is used for inspection. Therefore, the computer configuration is required as follows:

(1) Operating system: the virtual reality platform (VRP) supports Windows 2000 and Windows XP that depends on the system for patching the data on time.

(2) CPU: select the main frequency CPU with the lowest 800 MHz.

(3) Memory: for the memory, the minimum 128 M shall be selected, and the hard disk shall use more than 40 g.

Table 6: Computer configuration.

GPU	AMD Radeon™ R9 290
CPU	AMD FX™ 8350
RAM	10G
Video output	HDMI 1.4
USB port	1xUSB2.0
Operating system	Windows 10

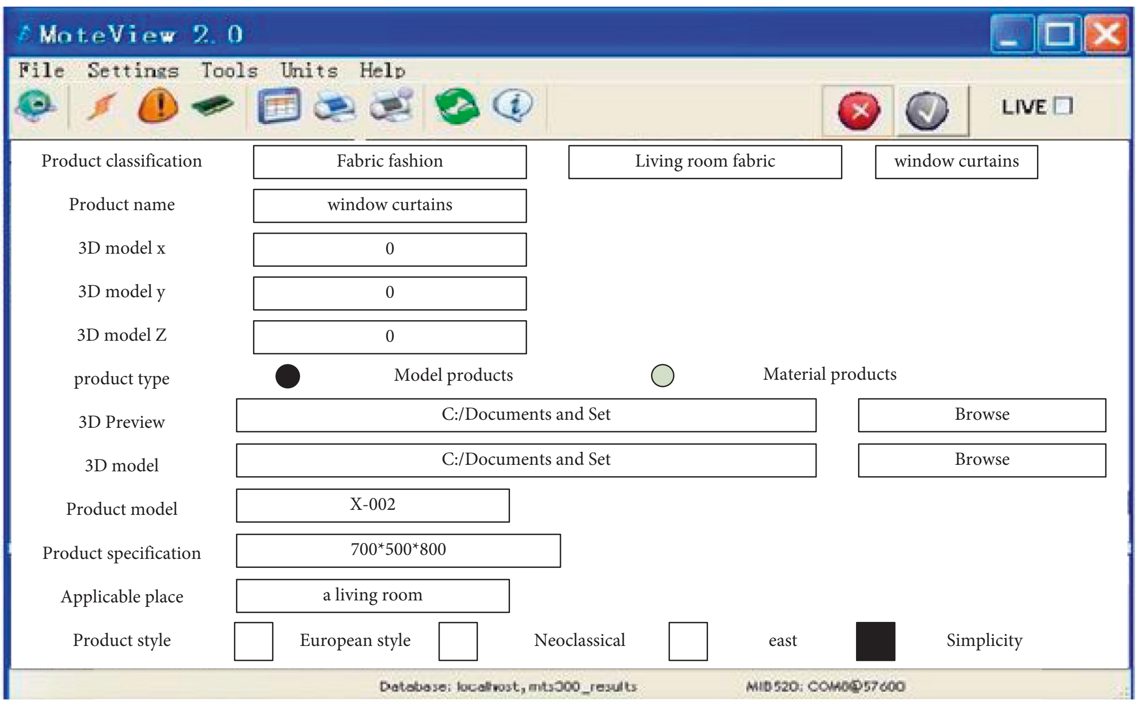

Figure 8: Database background material product import settings.

(4) Graphics card: Directx8.1 graphics card is suitable for virtual reality platform (VRP).

Based on virtual reality, material products can be imported in the reconstruction design of architectural decoration space. The steps are as follows:

First, rename the soft decoration material file: product id.jpg.

Secondly, import model products, fill in data and name, and preview files.

Finally, import the model product, upload the map file to the model file directory, and preview the directory (Figure 8).

After entering the virtual interface, the transformation of architectural decoration space can be created according to the operation process. The import setting can enable users to clearly select cloth art suitable for indoor style. Compared with traditional design methods, this method can improve the performance of soft decoration design and reduce the design cost. The traditional design method is compared with the design method in this paper, and the results are shown in Table 7.

It can be seen from the table that when the number of experiments is 1, the time spent on observability is shortened by 27 s compared with the traditional method, and the time spent on practicability is shortened by 3 s compared with the traditional method. When the number of experiments is 5, the time spent on observability is shortened by 37 s compared with the traditional method, and the time spent on practicability is shortened by 6 s compared with the traditional method. When the number of experiments is 50, using virtual reality to design the transformation of architectural decoration space, the observability time is shortened by 57 s compared with the traditional method, and the practicability time is shortened by 10 s compared with the traditional method. Therefore, the design method of architectural decoration space transformation based on virtual reality can save a lot of time and improve the effectiveness of design. In order to obtain the observability and authenticity of the customer satisfaction survey results, the fuzzy preference results and analysis are carried out, and the statistics are carried out in the decoration company. Calculate and summarize the survey results, as shown in Table 8.

It can be seen from the table that the classification indicators include lamps, fabrics, curtains, and other soft

Table 7: Time consumed by two design methods.

Number of experiments	Traditional method (s)		Virtual reality method (s)	
	Observability	Practicability	Observability	Practicability
1	79	57	52	54
5	91	62	54	56
10	97	66	58	56
50	120	70	63	60

Table 8: Investigation contents and results.

Target		Traditional design method		Virtual reality method	
		Classification index	Single index	Classification index	Single index
Fuzzy preference relation value	Very satisfied	30	50	270	370
	Satisfied	70	60	300	320
	Common	310	260	200	100
	Dissatisfied	260	260	50	40
	Very dissatisfied	190	230	30	20

decoration. Single index is the evaluation of each soft decoration product. In the traditional design method, the customer's satisfaction with the classification index and single index is about 7%, the neutral attitude is about 36%, and the dissatisfaction is as high as 57%. In the virtual reality method, the satisfaction of customers with classified indicators and single indicators is about 68%, the neutral attitude is about 12%, and the dissatisfaction is as high as 20%. It can be seen that customers are highly satisfied with the design of architectural decoration space transformation by the virtual reality method. According to the above experimental contents, the experimental conclusion is drawn. Compared with the traditional design methods, the rational application of virtual reality in the reconstruction design of architectural decoration space can improve the performance of soft decoration design, reduce the design cost, save a lot of time, and improve the effectiveness of design.

4. Conclusion

Virtual construction is the comprehensive development of knowledge in many different disciplines, and the knowledge coverage is quite large. The research explains the aim on virtual reality, standard model as well as data driven of model motion, and other technologies. All these things are based on the constituent technologies. The development of virtual construction technology is not mature and stable, and the integration of more interdisciplinary professional knowledge needs more research and investment. We have the rapid development of VR technology as well as the combined data for the architectural decoration based on the engineering technologies. For summarization of data, there is a need to work on the VR model as well as enhancement of all the interaction on the basis of model.

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.

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