Hindawi
Journal of Function Spaces
Volume 2023, Article ID 9863607, 1 page
https://doi.org/10.1155/2023/9863607

Retraction

Retracted: Construction of Holographic Immersion Chamber Based on Multisource Information Fusion and Interactive Virtual Reality Technology

Journal of Function Spaces

Received 17 October 2023; Accepted 17 October 2023; Published 18 October 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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] C. Wang and Y. Liu, "Construction of Holographic Immersion Chamber Based on Multisource Information Fusion and Interactive Virtual Reality Technology," *Journal of Function Spaces*, vol. 2022, Article ID 6406211, 10 pages, 2022.

Hindawi
Journal of Function Spaces
Volume 2022, Article ID 6406211, 10 pages
https://doi.org/10.1155/2022/6406211

Research Article

Construction of Holographic Immersion Chamber Based on Multisource Information Fusion and Interactive Virtual Reality Technology

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Received 11 May 2022; Revised 27 June 2022; Accepted 1 July 2022; Published 18 July 2022

Academic Editor: Miaochao Chen

Nowadays, many visual artists actively respond to the drastic changes taking place in today's society, build a communication bridge between real places and virtual places, and use holographic image technology to organically integrate them with each other. We are increasingly shuttling through the network of unbounded space. These spaces have no fixed geographical location. With the help of modern science and technology, they often fall into the field of vision of the viewer. With the development of the times, virtual reality technology is a computer simulation system that can create and experience the virtual world. It mainly uses computers to generate a simulated environment. It is a multisource information fusion interactive virtual reality technology to help users immerse themselves in the virtual environment. This paper studies the holographic immersion chamber based on multisource information fusion interactive virtual reality technology. The approximation index of the transformation matrix calculated by the registration algorithm based on SIFT+MSA is 1.7073, which is less than 4.0017 obtained by SIFT matching algorithm. It can be seen that the error of CCD image registration parameters calculated by this algorithm is smaller. In the process of the development of multisource information fusion interactive virtual reality technology, the technical feature of virtual reality is gradually integrated into the user and application object, becoming more closely connected and finally causing the user of the technology the feeling of "immersion" in the use experience.

1. Introduction

With the development of modern science and technology, the construction of places has become simpler and simpler. Nowadays, many visual artists actively respond to the drastic changes taking place in today's society, build a communication bridge between real places and virtual places, and use holographic image technology to organically integrate them with each other [1]. We are increasingly shuttling through the network of unbounded space. These spaces have no fixed geographical location. With the help of modern science and technology, they often fall into the field of vision of the viewer. One of the best is holographic image technology [2, 3]. We can apply holographic projection to all indoor spaces for display. Holographic projection system can turn the objective environment into an "invisible" display interface and make anything existing in the virtual environment happen in real life visually and psychologically. The following professional categories can use holographic projection to complete a set of visual information transmission scheme [4]. The sense of immersion and the behavior of immersion are integrated. From the perspective of consciousness, immersion is inseparable from the creation of authentic and credible situations. Holographic image technology is used to restore all the relevant information of the recorded object in the real physical space. The three-dimensional image presented by it has a real visual effect combined with the depth of field information of the physical environment [5, 6]. In terms of the three-dimensional presentation effect of art, it subverts people's cognition of the traditional concept

of "place"—implanting three-dimensional virtual images and creating a virtual immersive environment place, which greatly expands the expressiveness of visual art and deeply affects people's daily life.

Virtual reality emerged at the end of the 20th century. It is an information integration technology system that comprehensively uses computer multimedia, digital image processing, pattern recognition, artificial intelligence, sensors, and high-resolution display technology to achieve tactile virtual senses on the basis of vision and hearing and generate realistic three-dimensional virtual environment [7]. Virtual reality technology is a computer simulation system that can create and experience the virtual world. It mainly uses computers to generate a simulated environment. It is a multisource information fusion interactive virtual reality technology to help users immerse themselves in the virtual environment [8, 9]. Virtual reality technology truly realizes human-computer interaction, so that people can immerse themselves in a wonderful environment. At present, on the basis of multisource information fusion interactive virtual reality technology, many new concepts including virtual reality city and virtual reality tourism are also put forward. It can be said that virtual reality technology has become one of the most promising technologies [10]. The use of multisource information fusion interactive virtual reality can be divided into consumer and enterprise markets. The former focuses on immersive video and digital game experience, while the latter mainly focuses on military, medical, architecture, education, and other scenes [11, 12].

Holographic immersive image technology creates a virtual environment. This technical immersion environment can be divided into sensory immersion and participatory immersion. First, sensory immersion mainly appeals to the viewer's sensory organ experience. Since the integration of the three-dimensional image presented by the holographic image and the real physical world is realized in the state of almost transparent interface, it has a strong sense of reality and presence, which can better promote the viewer to obtain an immersive live narrative experience [13]. Holographic immersive live experience can attract viewers' attention, enhance their participation, let them actively rather than passively integrate into the narrative, and establish a deeper understanding and memory of the narrative content and significance. An education column is set up on the website to provide users with training services for the use skills of multisource information fusion interactive reality technology. Through online interaction, users can learn relevant operation technologies of virtual reality online and immerse themselves in interactive experience, which can better stimulate users' interest and make more effective use of relevant services [14]. In the development process of multisource information fusion interactive virtual reality technology, the technical feature of virtual reality is gradually integrated into the user and application object, becoming more closely connected and finally causing the user of the technology the feeling of "immersion" in the use experience [15].

The innovative contribution of this paper lies in the analysis of holographic projection based on multisource information fusion interactive virtual technology. The approximate index of transformation matrix calculated by SIFT+MSA matching algorithm is 1.7073, which is less than 4.0017 obtained by SIFT matching algorithm. It can be seen that the error of CCD image registration parameters calculated by this algorithm is small. Holographic projection technology breaks through the limitations of traditional sound, light, and electricity; brings beautiful pictures to the audience; and gives people a dual world feeling of virtual and reality.

2. Related Work

2.1. Research Status at Home and Abroad. Liu et al. proposed that in the visual narration of holographic images, the identity of the viewer is also changing, from the object of being informed to the subject who can directly participate in the narration and even construct the narrative content. The narrative subject can not only be used as a narrative tool but also become the purpose and means of narration [16]. Wei proposed that exploring the unknown is the driving force for human progress, and expanding human living space is one of the best choices. However, for people living on earth, the application of holographic virtual technology to life will greatly expand our living space [17]. Che et al. proposed that holographic projection can not only be used alone but also be used together with other multimedia devices. The purpose of its application is to immerse people in a visual enjoyment different from print media with a convenient, cheap, and novel technology [18]. Li et al. proposed that holographic visual narrative can not only use the traditional linear time structure but also present the narrative form of coexistence of linear and nonlinear. Linear time can be deconstructed into narrative fragments, providing viewers with a variety of narrative elements of their choice when immersed in the same time. After selecting and entering a separate narrative element, the narrative is carried out in a linear time structure [19]. Pei et al. proposed that holographic virtual display is also an art form, and each art form has a certain connection with reality. Therefore, the immersion feeling brought by the display of the same content is different [20]. Pan et al. put forward that holographic virtual technology has been silent since its emergence in the last century, but with the continuous development of computer science, holographic virtual technology has only a broader application and development space. In this process, there is continuous communication and exchange between Si Gan Dou scientists and artists. The use of computer technology and network technology makes the communication between works of art and the audience more smooth and deepens the public's understanding of art and science and technology [21]. Lei et al. proposed that holographic projection is highly technical, involving many professional requirements such as accurate photography technology, transformation algorithm for generating pure phase hologram, nanotechnology, materials science, and optics. In practical application, laser sensing technology, touch control technology, and voice control technology are also needed to realize perfect immersive visual effect and interactive experience [22]. Huang et al. proposed that the three-dimensional visual effect displayed

by holographic image is more direct and realistic, which is easier to stimulate the resonance of the viewer in visual perception, forming the viewer's immersed visual reality and space-time reality [23]. Wang et al. proposed that holographic projection transforms the traditional two-dimensional plane image into a dynamic, three-dimensional, and multidimensional viewing image. Consumers can place the holographic projection photo in the holographic projection frame and even add the holographic projection function to the smart phone in the future, which can be displayed directly by the mobile phone. Holographic projection photos break through the static state and can coexist acoustically and dynamically [24]. Ma et al. proposed that from the perspective of behavior, immersion is inseparable from the perception of presence; that is, the viewer's body and consciousness are naturally placed directly in the situation. Immersion is to make people focus on the current goal (created by the designer) and feel happy and satisfied but forget the real world situation. The direct participation of the body makes the viewer closer to the narrative content, understand the narrative in their own way, and obtain cognition [25].

2.2. Research Status of Holographic Immersion Chamber Based on Virtual Reality Technology. Based on multisource information fusion interactive virtual reality technology, this paper studies the holographic immersion room. The multisource information fusion interactive virtual reality technology can not only make the designer intuitively understand the intention but also make the construction party directly understand the design intention and design effect. It is also very helpful for customers to have an immersive experience. The integration of multisource information fusion and interactive virtual reality technology enhances the visibility and representativeness of the design model. Under the function of virtual display, users have a feeling of interactive design and visual design, which greatly enhances the marketing effect. Holographic image technology appears in front of the public with the development of human social science and technology. In terms of its historical time, holographic image technology is still a new thing. From the perspective of the application of holographic image technology in practice, it still has great uncertainty. Researchers and practitioners in relevant fields need to further develop the effective function of this technology. The narrative subject presented by holographic image breaks through the visual limitations of two-dimensional narrative subject or pure virtual environment in traditional visual narrative expression methods and brings tension and real three-dimensional visual experience to the viewer. Based on multisource information fusion, interactive virtual reality technology can achieve the following effects: perceptual systems such as visual, auditory, and tactile immersion and behavioral systems, such as direction, language immersion, and expression system immersion. Through the recognition of interactive virtual reality technology based on multisource information fusion and the sign language recognition system based on vision, virtual reality can restore nonverbal information such as gestures, facial expressions, and posture. In the field of information fusion, many scholars often refer to terms similar to information fusion, such as data fusion, information fusion, and multisensor fusion. These concepts are both different and closely related. Virtual display technology is a new type of science and technology, which has just been popularized, so it is more attractive to most people. In this sense, virtual inch display has novel and unique characteristics, which is also one of the main reasons for the audience to come to the exhibition. The emergence of multisource information fusion interactive virtual reality technology has brought significant innovation to the imaging problem in the field of new media. This emerging technology not only makes outstanding contributions to virtual imaging but also has a far-reaching impact on promoting the development of other industries, including film and television industry, construction industry, exhibition planning industry, and tourism and leisure industry.

3. Principle and Model of Multisource Information Fusion Virtual Reality Technology

"Virtual reality technology" was put forward in the early 1980s. As a simulation technology and a challenging fashion frontier interdisciplinary subject, it combines simulation technology with computer graphics, man-machine interface technology, sensing technology, and multimedia technology to generate a virtual situation. This virtual three-dimensional dynamic situation integrating multisource information makes people feel like the real world. Data fusion is mainly aimed at all kinds of information fusion expressed in the form of data. When the information needed is the measured data of sensors, data fusion is called sensor fusion. Information fusion includes data fusion and sensor fusion, but the scope of information fusion is broader. In addition to data, the fused information can also be extended to images, notes, symbols, knowledge, and intelligence. At present, there is no clear distinction in the field. Virtual reality technology is the integration of electronic science and technology and information technology. In essence, it is a new communication medium and communication tool. From the perspective of media, virtual reality, with its new way of information exchange and unique use experience, produces a subversive way of communication-immersive communication. It has become a super media that surpasses popular media such as newspapers, magazines, radio, film, television; and Internet, realizes virtual crosstemporal interaction; and creates realistic on-the-spot communication. Using the similar method, the best matching position in the first level resolution can be found step by step, and the amount of search calculation decreases in geometric order. The flow chart of multisource information fusion algorithm is shown in Figure 1.

Virtual reality systems are usually equipped with a variety of sensing devices, including visual, auditory, and tactile devices. In the future, taste and olfactory sensing devices may be developed. In addition to official sensing devices, there are kinesthetic sensing devices and reaction devices. These devices enable the virtual reality system to have

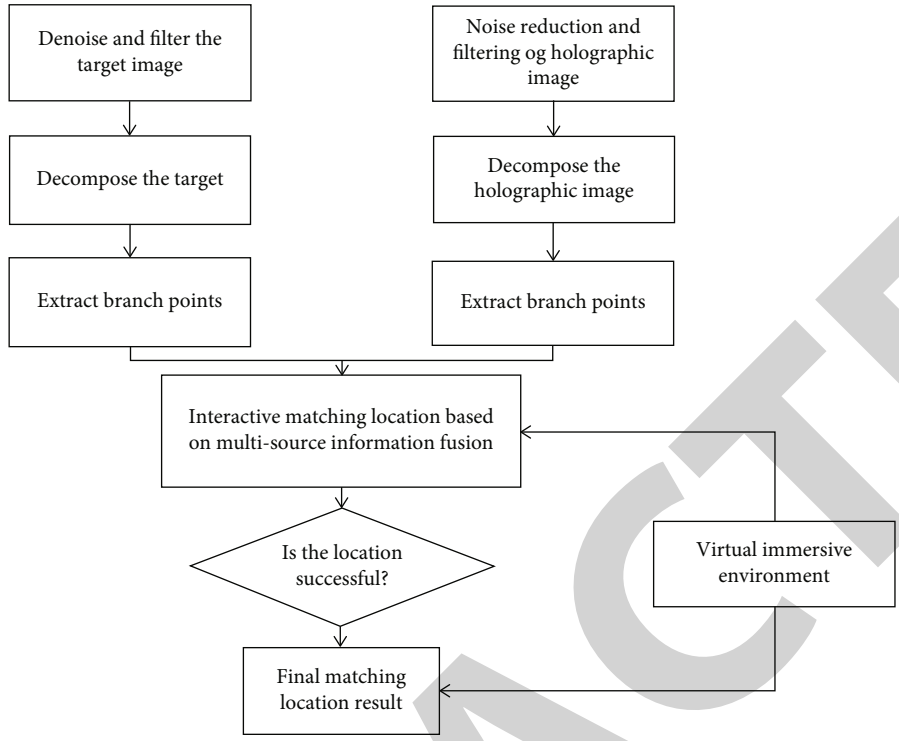

Figure 1: Flow chart of multisource information fusion algorithm in holographic immersion.

multisensory functions and enable users to obtain a variety of senses in the virtual environment. The organization of multisource information fusion is the data fusion joint command Laboratory of the U.S. Department of Defense. After continuous revision and practical expansion, this model has been determined as the actual standard of the U.S. defense information fusion system. A multisource information fusion virtual reality technology model is proposed, as shown in Figure 2.

The imaging band is $0.33 \sim 0.77\ \mu$m, and the radiation of the ground object is composed of its own light radiation and the radiation of the surrounding environment reflected by it. Its radiation brightness can be expressed as

$$L_{\text{sum}} = L_0(\theta_r, \psi_r) + L_{rE}(\theta_r, \psi_r). \tag{1}$$

Among them, (θ_r, ψ_r) represents the radiation direction, its own radiation brightness is represented by $L_0(\theta_r, \psi_r)$, and its reflection brightness to surrounding objects is represented by $L_{rE}(\theta_r, \psi_r)$. In fact, in the $0.33 \sim 0.77\ \mu$m band, most ground objects can be regarded as diffuse reflectors, so the (θ_r, ψ_r) influence of radiation direction can be ignored, and the formula becomes

$$L_{\text{sum}} = L_0 + L_{rE}. \tag{2}$$

$L_0 = \varepsilon L_{h0}$ can be obtained according to Planck formula, where ε is the surface emissivity of diffuse reflector and L_{h0} is the radiance of absolute blackbody at the same temperature as the ground object. L_{rE} is composed of solar radiation and atmospheric scattering, which can be expressed as $L_{rE} = (\rho/\pi)E_{\text{sum}}$, where $\rho = 1 - \varepsilon$ and E_{sum} represent the irradiance of solar radiation and atmospheric scattering, so it can be expressed as

$$L_{\text{sum}} = (1 - \rho) \cdot L_{h0} + \rho \cdot \frac{E_{\text{sum}}}{\pi}. \tag{3}$$

Generally, we think that the ground object is in the normal temperature state. According to Planck's law, L_{h0} is negligible. It can be seen that the main parameters affecting the visible light characteristics of the ground object are ρ and E_{sum}, which shows that the factors affecting the imaging quality of the visible light image are lighting conditions and meteorological factor, and explains the reason why the CCD sensor cannot work all day.

The reflectivity ρ represents the reflection ability of the ground object to the surrounding radiation, which can be described by the bidirectional reflection distribution function. For the opaque gray body, its transmittance $\tau = 0$, so it meets the requirements.

$$\varepsilon = \alpha = 1 - \rho. \tag{4}$$

The image is mainly disturbed by additive system noise and multiplicative speckle noise.

$$I(x, y) = R(x, y)\eta_0(x, y) + \eta_1(x, y), \tag{5}$$

where $I(x, y)$ represents the output image of the imaging system, $R(x, y)$ represents the scattering characteristics of ground objects, $\eta_0(x, y)$ represents multiplicative speckle noise, and $\eta_1(x, y)$ represents additive system noise.

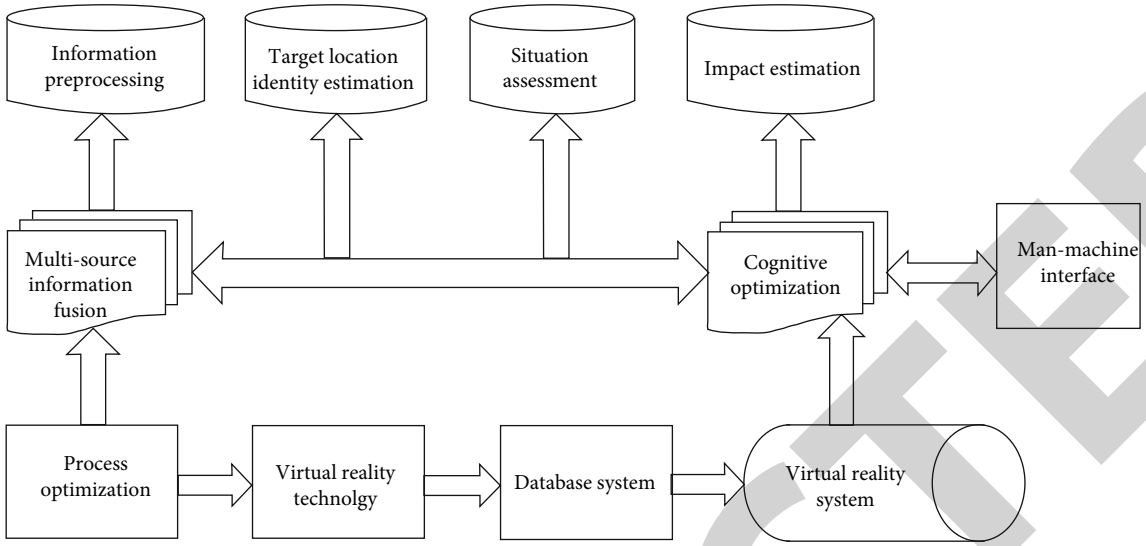

Figure 2: Multisource information fusion virtual reality technology model.

Gaussian filter is a commonly used low-pass filter, which can filter the noise of high-frequency part. The expression of Gaussian filter is

$$f'(x,y) = f(x,y)^* g(x,y). \tag{6}$$

$f(x,y), f'(x,y)$ represents the pixel value before and after processing, $g(x,y)$ represents the Gaussian kernel function, and its expression is

$$g(x,y) = \frac{1}{\sqrt{2\pi\sigma}} \exp\left(-\frac{x^2+y^2}{2\sigma^2}\right). \tag{7}$$

The σ value determines the smoothing effect of Gaussian filter. The smoothing result of the image using the filter window with the size of t can be expressed as

$$f'(x,y) = \sum_{i=-t}^{t}\sum_{j=-t}^{t} f(x-i,y-j)\frac{1}{\sqrt{2\pi\sigma}} \exp\left(-\frac{x^2+y^2}{2\sigma^2}\right). \tag{8}$$

This method has a good effect on removing Gaussian white noise, but at the same time, it will destroy some other details in the image and affect the extraction of point, line, and other types of features. Therefore, it is necessary to adjust the parameters of the filter to retain other features as much as possible while suppressing noise interference.

The mean filtering adopts the "windowed average" method to divide the gray level of the noise point (x,y) equally to the pixels with the size of $m \times n$ around it. The mean filtering expression of the image size is

$$f'(x,y) = \frac{1}{m \cdot n} \sum_{i,j \in m \times n} f(i,j), \tag{9}$$

where $f'(x,y)$ represents the noise point obtained by mean filtering, and the neighborhood range of point (x,y) is taken as $m \times n$. Obviously, the disadvantage of this filtering method is that the same processing is adopted for noise points and nonnoise points. While smoothing the noise interference, it will inevitably lose the detailed information in the image and still blur the edge.

For digital images, the filtering process in spatial domain can be expressed as the convolution of the original image and the filter kernel function.

$$\begin{aligned} f'(x,y) &= f(x,y) * h(x,y) \\ &= \frac{1}{MN}\sum_{m=0}^{M-1}\sum_{n=0}^{N-1} f(m,n)h(x-m,y-n). \end{aligned} \tag{10}$$

According to the relationship between spatial domain and frequency domain, the convolution in SD can be converted into product in FD. Virtual reality has developed rapidly in the past two years. Facebook, Microsoft, Google, and others have joined the game. Virtual reality creates an immersive interaction in which the machine construction environment is infinitely close to the reality perception environment, and conveys to users a complete and comprehensive physical and psychological feeling like the real situation. Human-computer interaction tends to return to people's original state more and more. Information fusion is a general framework for simultaneous interpreting or combining methods and tools from different sensor data. The purpose of information fusion is to obtain higher quality information. Famous Chinese scholars Han Chongzhao and Zhu Hongyan believe that multisource information fusion is actually a functional simulation of the human brain's comprehensive processing of complex problems. Multisource information fusion interactive virtual reality technology not only spreads and communicates across the limitations of time and space but also creates a technical

system that can make the virtual natural environment act on the human body and produce various senses and limb reactions, that is, using human body perception to construct a second nature constructed by optoelectronic materials and create an optoelectronic interface environment that can make it difficult for users to distinguish between true and false.

4. Realization of Holographic Immersion Chamber

4.1. Construction of Holographic Immersion Chamber System Based on Virtual Reality Technology. The expansion of space and the three-dimensional presentation of holographic images make the visual narrative no longer stick to the limited picture frame and construct the content and meaning of the narrative. The spatial dimension of visual narrative has the possibility of more diversified extension. The narrative elements in different picture frames are released from the space restrictions artificially cut and split, and more abundant narrative content is transmitted through more free arrangement and combination. Holographic projection immersion system based on multisource information fusion interactive virtual reality technology is mostly used in 360° booth and 270° booth of small products in the commercial application of exhibition cabinet. Most of the contents are relatively simple rotating animation. Of course, some are also used to display characters, but the action of characters is simple. In the commercial application of the stage, in order to meet the viewing angle of the stage, the single-chip holographic screen of 180° is mostly used. The application modes of multisource information fusion interactive virtual reality technology include virtual performance, virtual and real person interaction, real person performance, and holographic special effects. Compared with the large amount of equipment and space occupied by equipment in traditional dance beauty design, the requirements of new media technology for equipment space are greatly reduced, and the transformation of various effects can be easily realized.

The holographic immersion room system of multisource information fusion interactive virtual reality technology is an extension and innovation of traditional visual narration. It builds a bridge between the viewer and narration. Through the immersive on-site narrative experience, it increases the viewer's emotional input and active participation, shortens the distance between the viewer and narration, endows visual narration with new vitality, and transmits more profound and unforgettable narrative connotation. Holographic immersion room system is a dynamic display mode. Its operable and interactive form shortens the distance between consumers and products, and consumers directly experience all the functional features of products in their use and participation. Multisource information fusion interactive virtual reality technology this way not only improves the added value of products but also fully mobilizes consumers' interest, so as to stimulate consumer behavior and directly bring considerable economic benefits. The holographic immersion room system uses holographic projection skills to build a scientific, innovative, and interactive environment. The details of goods are displayed through holographic imaging, which can attract the attention of visitors. It can also be applied in the fields of cars, large forklifts, watches, jewelry display, and so on, which can not only achieve the intention of showing to the audience but also reduce the consumption of booths and exhibits, holographic projection museum, holographic projection dance, holographic projection telephone, etc.

4.2. Experimental Results and Analysis. In this experiment, the image is registered with the same target image; the parameters of the transformation matrix are calculated, compared with the affine transformation matrix imposed by human; and the approximation index e of the transformation matrix is calculated. SIFT feature is a local feature of an image, which maintains invariance to rotation, scaling, and brightness changes and also maintains a certain degree of stability to angle changes, affine transformations, and noise. It also maintains good matching for the factors such as object motion, occlusion, and noise, so that the feature matching between two images with large differences can be realized. At the same time, taking the registration algorithm that separately uses sift as the matching feature and other matching strategies consistent with the algorithm in this section as a reference, the matching accuracy of the two algorithms under affine transformation is directly compared. The exact registration affine transformation parameters of images are shown in Table 1.

It can be seen from Table 1 that the approximation index of the transformation matrix calculated by the registration algorithm based on SIFT+MSA is 0.8646, which is less than 1.2697 obtained by the SIFT matching algorithm. It can be seen that the parameters calculated by the algorithm in this section are closer to the real value and have higher accuracy. The original image is too large and has been reduced to 83% of the display.

The matching points are obtained according to the two algorithms. The comparison between the affine transformation parameters fitted by the least square method and the real affine parameters is shown in Table 2.

The distortion of the scene in the imaging process will make the image out of proportion. Affine transformation can be used to correct various distortions. The parameters of affine transformation can be estimated by the least square method. It can be seen from Table 2 that the approximation index of the transformation matrix calculated by the registration algorithm based on SIFT+MSA is 1.7073, which is less than 4.0017 obtained by the SIFT matching algorithm. It can be seen that the error of CCD image registration parameters calculated by the algorithm in this section is smaller.

The matching points are obtained according to the two algorithms. The comparison between the affine transformation parameters fitted by the least square method and the real affine parameters is shown in Table 3.

It can be seen from Table 3 that the approximation index of transformation matrix calculated by SIFT+MSA

Table 1: Affine transformation parameters for accurate image registration.

Image	a	b	c	d	e	Approximation index
Real parameters	1.2	0.2	-2	0	1	0
SIFT	1.2082	0.4012	-4.0751	0.1013	1.1051	1.2697
SIFT+MSA	1.0771	0.2871	-2.1358	-0.0061	1.0035	0.8646

Table 2: Affine transformation parameters for accurate registration of visible images.

Visible image	a	b	c	d	e	Approximation index
Real parameters	0.7	0.2	51	0.2	0.6	0
SIFT	0.8895	0.1657	53.4828	0.2955	0.7693	4.0017
SIFT+MSA	0.7898	0.2751	50.9406	0.2974	0.6802	1.7073

Table 3: Affine transformation parameters for accurate image registration.

Infrared image	a	b	c	d	e	Approximation index
Real parameters	0.7	0.1	2	-0.2	1.1	0
SIFT	0.8991	0.1995	3.3548	-0.1988	1.2981	2.1686
SIFT+MSA	0.7925	0.1015	3.2677	-0.1996	1.2025	1.0037

Table 4: Comparison of registration results of real images.

Registration algorithm	Feature points extracted from real image and target image	Rough matching feature points	Fine matching feature points	Match score	Matching rate	RMSE	Subjective evaluation of local details
SIFT	(257, 1505)	121	30	46.32%	24%	1.4472	Dislocation
SIFT+MSA	(111, 693)	62	41	56.24%	66.66%	0.6424	High accuracy

registration algorithm is 1.0037, which is less than 2.1686 obtained by the SIFT matching algorithm, and the error is smaller.

The evaluation system of image registration algorithm compares the two algorithms, and the calculated evaluation indexes are shown in Table 4.

It can be seen from Table 4 that the feature points extracted by the SIFT algorithm from the real image and the target image are 257 and 1505, respectively, and the logarithm of feature points obtained by rough matching is 121. Based on this, the matching score is 46.32%. After further screening the matching points by RANSAC method, 30 pairs of fine matching points can be obtained, and the matching rate is 24%. After matching, the RMSE of the two images is 1.4472.

In this experiment, different numbers of recommended list items are set in the data set to compare the recommended diversity results of pUCP algorithm, phui growth algorithm, and this algorithm. Three experiments were carried out to compare the holographic image immersion. The experimental results are shown in Figures 3–5.

It can be seen from Figure 3 to Figure 5 that when the number of recommendation lists is small, the difference between the experimental results of the three algorithms is very small, because the fewer the items in the list, the greater the possibility of approximation. However, with the increase of the number of lists, phui growth loses more item sets, and the resulting association rule base is inaccurate, resulting in similar items in the recommendation list, and the recommended diversity index will be significantly higher than the other two algorithms. Because the accuracy of this algorithm is higher than the other two algorithms, the holographic immersion chamber based on multisource information fusion interactive virtual reality technology is better than the other two algorithms in diversity.

In this experiment, holographic image technology creates a virtual immersive extraction method as follows: during the operation of the algorithm, insert multiple test points. In each test point, first, forcibly delete the garbage nodes generated during the operation of the algorithm, and then, extract the current memory consumption value, and take the maximum of these values as the memory consumption value of the current algorithm. Set the number of different recommended list items, and compare the recommended diversity results of pUCP algorithm, phui growth algorithm, and this algorithm. Conduct two experiments, respectively, for comparison, and the operation results are shown in Figures 6 and 7.

It can be seen from Figure 6 to Figure 7 that the memory consumption of the algorithm up growth increases with the

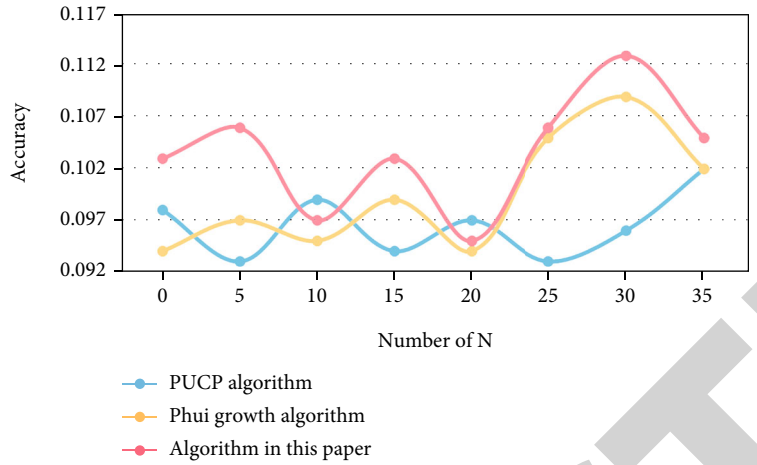

Figure 3: Diversity analysis of holographic immersion chambers recommended by different algorithms.

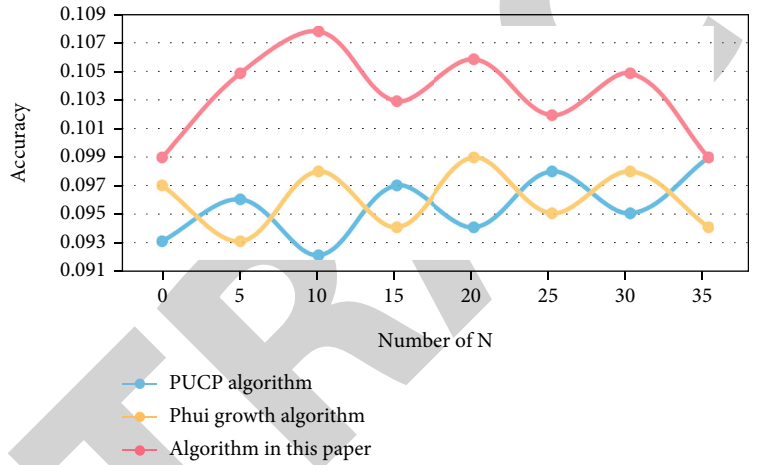

Figure 4: Diversity analysis of holographic immersion chamber recommended by different algorithms.

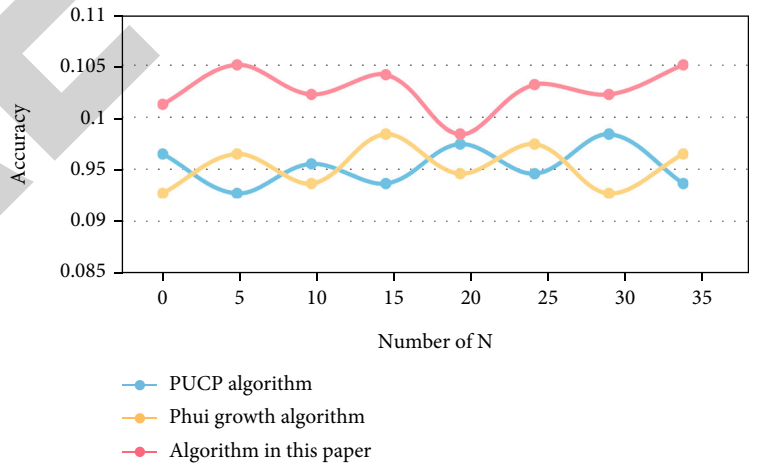

Figure 5: Diversity analysis of holographic immersion chamber recommended by different algorithms.

decrease of the minimum utility threshold. This is because the nodes in the utility mode tree increase with the decrease of the minimum utility threshold, but the memory consumption of the algorithm in this paper and phui growth algorithm basically does not change much. This is because the two algorithms adopt a parallel strategy. The algorithm

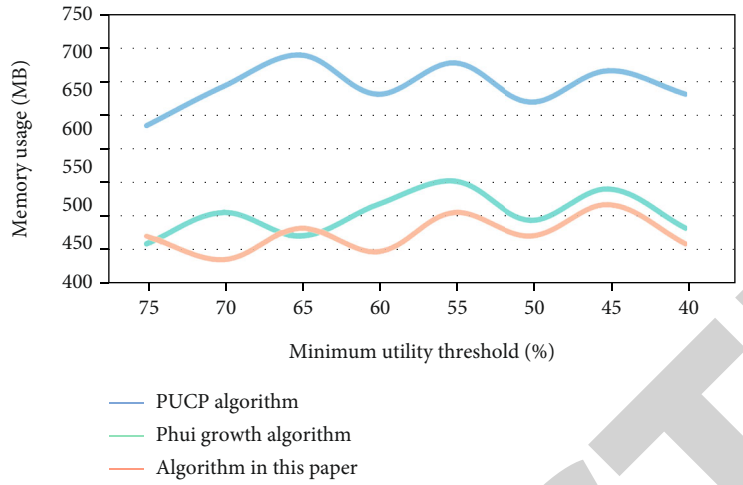

Figure 6: Comparison of virtual immersion consumption of holographic image technology under different algorithms.

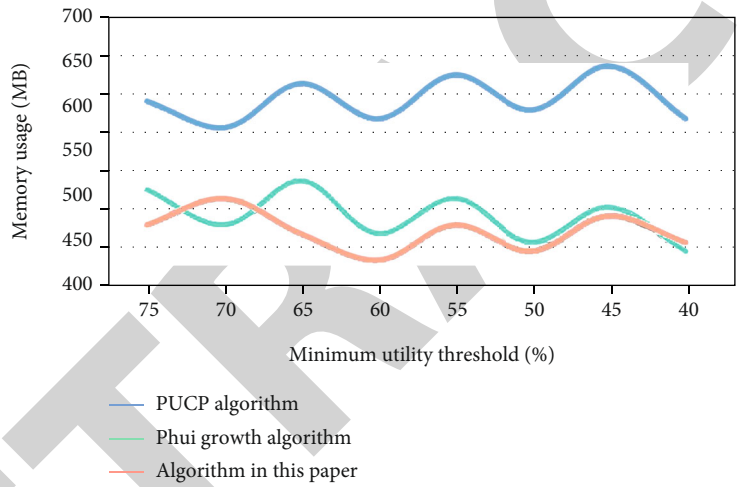

Figure 7: Comparison of virtual immersion consumption of holographic image technology under different algorithms.

in this paper uses the clustering partition method to build similar transactions into a utility pattern tree. The tree structure has fewer branches and uses the mode of pattern growth for mining, which reduces the number of candidate item sets. It adopts the tree structure and does not store noncandidate item sets. Therefore, it occupies less memory than the phui growth algorithm.

5. Conclusions

Multisource information fusion interactive virtual reality technology is an interdisciplinary subject integrating bionic technology, electronic technology, communication technology, and computer technology. It is also a cutting-edge subject prioritized by most countries. With the emergence of various new technologies, especially computer technology and communication technology, it has promoted the development of multisource information fusion interactive virtual reality technology, All kinds of new equipment relying on multisource information fusion interactive virtual reality technology are emerging. Holographic projection will be diversified in the development, but with its gradual improvement, it will be widely used in the performance exhibition space. Once the holographic projection technology is popularized, the cost is reduced and the convenience is improved; its role cannot be underestimated. This paper studies the holographic immersion chamber based on multisource information fusion interactive virtual reality technology. The approximation index of the transformation matrix calculated by the registration algorithm based on SIFT+MSA is 1.7073, which is less than 4.0017 obtained by the SIFT matching algorithm. It can be seen that the error of CCD image registration parameters calculated by this algorithm is smaller. Holographic projection technology breaks through the limitations of traditional sound, light, and electricity; brings beautiful pictures to the audience; and gives people a double world feeling of coexistence of virtual and reality. In the future, the market development potential of holographic projection technology will be immeasurable. In the future, with the continuous maturity of technology,

holographic projection is bound to change the design ideas and methods, and its application scope will be more and more extensive and even change people's immersed lifestyle. The research has certain limitations, lack of integration of BIM Technology with VR technology in the design to form a BIM+VR integrated system. The software and hardware used in the industry are effectively combined to promote the continuous development of design. This is one of the directions of future design development.

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 known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

This work was supported by Department of Science and Technology of Jilin Province (No. 20190302114GX).

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