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Retraction

Retracted: Interactive Innovation Research on Film Animation Based on Maya-Unity Animation Simulation of Visual Sensor

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] Y. Sang, "Interactive Innovation Research on Film Animation Based on Maya-Unity Animation Simulation of Visual Sensor," *Journal of Sensors*, vol. 2021, Article ID 1158251, 20 pages, 2021.

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Research Article

Interactive Innovation Research on Film Animation Based on Maya-Unity Animation Simulation of Visual Sensor

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At present, enhancing the understanding of the importance of the development of cultural and creative industries and grasping the future development trends of the whole society has become the primary issue for the development of this industry in our country. The main work of this paper is based on the interactive innovation research of visual sensor Maya-Unity animation simulation in film and television animation. Maya Unity puts the required lights on the model, adds texture materials, etc., selects all objects, and uses the "Mesh- > Combine" command. Then, open "Create UV->Automatic Mapping" for these objects to perform the UV operation. Open "Window-> UV Texture Editor" and check the new UV for baking. First, the article introduces an overview of the development of cultural and creative industries and the application status of virtual simulation technology in film and television animation. Then, the article introduces the characteristics of visual sensors and interactive design ideas. The scene view displays the document from a graphical perspective, while the code view displays the text content of the document. Both views must be displayed in the split window Dreamer, and only one view can be displayed at the same time; so, it is necessary to establish a button for scene and code switching. The animation scene will change with the passage of time following the development of the story. Therefore, in the lighting design, the animation changes of light intensity and color temperature should be produced. The time to complete a frame of image matching is 135 ms, and to complete a feature measurement, 8 frames of images are used for template matching, and then the average coordinate value is calculated, which takes about $135 \times 8 = 1080$ ms, which meets the system requirements. The main effect of the text effect is very significant, $F = 13.780$, $P < 0.001$. Comparison of effect between development and middle to two sides, $P = 0.02$, $P < 0.05$. The results show that the use of Maya-Unity software for animation simulation can make the rendering of the animation more beautiful.

1. Overview of the Development of Cultural and Creative Industries and Film and Television Animation Industries

1.1. Overview and Status Quo of the Development of Cultural and Creative Industries. China has a long history of cultural resources. It has resource advantages unmatched by other countries in the world in terms of cultural depth, historicity, horizontal, and national richness. One of the elements of the development of cultural and creative industries is cultural resources. To develop cultural and creative industries, we should actively develop China's cultural resources and pay attention to the innovation of China's traditional culture.

The overall development of China's cultural and creative industry should not only vigorously develop cultural and creative industry parks and give full play to the cluster effect on the basis of inheriting the existing development achievements but also pay attention to the absorbing experience of developed countries and strive to build a relatively complete and clear cultural and creative industry chain. Therefore, generally speaking, the development mode of China's cultural and creative industry can be described from two points of space and time: gathering in space to build industrial clusters and linking in time to build industrial chains. As cultural and creative industries are increasingly dependent on scientific and technological progress, especially digital

technology, they are bound to use many common service facilities, such as broadband networks, databases, information service institutions, and digital production and processing facilities, to reduce production costs.

Shafi believes that the cultural and creative industries (CCIs) sector is highly recognized on the development agenda of the South African government. However, compared with developed countries, the contribution of this sector to the econoour appears to be extremely low. His purpose is to assess the extent to which South Africa's CCI contributes to economic development through its foreign exchange earnings and employment profile. He discussed the challenges and problems of underperformance in the industry. He believes that the South African government must use CCI in a timely manner to enable it to provide all potential benefits related to it [1].

Wu believes that cultural and creative industries (CCI) are increasingly seen as a means to cure economic stagnation and promote sustainable development; therefore, they have become the focus of cultural, social and economic policies. He discussed the issues that should be considered in the development of CCIs from the perspective of urban governance. He combined entropy weight and grey relational analysis to form an evaluation index system that considers fuzziness and complexity. His research results show that cities in the eastern region and island cities are more able to use cultural resources for investment than cities in the western region. This shows that local governments understand that the economic benefits of culture are not limited to certain CCIs, but also extend to the entire econoour [2].

As a special model of cultural and creative industries, cultural and creative industry parks are developing in full swing. The cultural and creative industry park has the function of integration and convergence. Enterprises in the park can share information, divide labor, and collaborate, thereby reducing production costs. At present, our country lacks a direct leadership organization for the cultural and creative industries. This is the direct cause of the lack of national planning. As a result, the development of cultural and creative industries in various regions is limited to immediate interests and neglects long-term macrointerests. This not only wastes resources, but also wastes resources. It is also difficult to form the cultural characteristics of the region, thus restricting the overall development of cultural and creative industries. Therefore, the first priority for the current development of cultural and creative industries is to establish a national guidance agency, formulate long-term development plans, coordinate the relationship between various regions, create distinctive cultural and creative industry centers, and realize the misaligned development of the east, middle, and west [3].

In recent years, while implementing political and economic reforms, our country has also intensified the reform of the cultural industry. Although enterprises have gradually reduced their dependence on the government, local protectionism, industry barriers, and fragmentation still exist, making market resources. The allocation is difficult to maximize, and the scale effect of cultural and creative industries is difficult to play, and the overall competitive advantage is lost. Therefore, it is necessary to correctly handle the relationship between the government and cultural and creative enterprises, clarify the division of rights, responsibilities, and benefits between the two, and give full play to the resource allocation role of the "invisible hand" of the market, so that the enterprise becomes the real main body of the market [4].

1.2. Overview and Status Quo of the Development of the Film and Television Animation Industry. China's animation industry is a very important part of our country's contemporary cultural and creative industry. On the one hand, whether our country's animation industry can achieve a breakthrough under the current status quo is closely related to whether it can make full use of the opportunities that our country's contemporary cultural and creative industries are booming. The imbalance between the supply and demand of animation creation is also one of the important reasons why foreign animation has entered and entered the house to occupy the Chinese market. On the other hand, Chinese animation fixes the audience to young people. For adult audiences, there is a lack of new works that can have an impact. This market gap is also filled by a large number of foreign animations. Therefore, the output of Chinese animation is far from meeting the needs of broadcasting nor can it meet the cultural needs of the majority of adults [5].

China's animation cannot keep up with the pace and rhythm of the times. There is an extremely large loophole; that is, there are major problems in the chain of reaction between animation products and social relations after production. In short, it is far from enough for the dissemination of cultural products. It is true that today's Chinese animation industry has shown signs of thawing and warming under the support of policies, the total amount of animation is also increasing, and the creative themes are increasing day by day, but the overall quality of Chinese animation is still a basic fact that is difficult to ignore, and Chinese animation is still looking for its final way out of confusion. In this process, Chinese animation began to learn from the experience of animation, in developed countries, began to imitate the animation of other countries, and ignored the original appeal of Chinese animation [6].

1.3. Interactive Development Strategy and Model of Cultural Creativity and the Film and Television Animation Industry. To fundamentally improve the level of Chinese animation culture and see the most positive and fresh animation elements, the talent training mode and the education mode of animation practitioners must be innovated in time. The old training and education mode has been difficult to keep up with the requirements and speed put forward by the contemporary cultural and creative industry for the animation industry. Small scale enterprises and a few large cultural and creative enterprises are the characteristics of China's cultural and creative industry. Due to the high market risk of cultural and creative industry and the lack of enterprise financing collateral, the financing problem has become a major problem restricting the development of cultural and creative enterprises. At this time, cultural and creative

enterprises have a large demand for funds. The uncertainty of the investment carriers and the mismatch of risk and income make it difficult for enterprises to obtain funds [7].

In addition, at the stage of government review, promotion, and sales, whether cultural creative products are compatible with national policies and regulations, whether they conform to the cultural taste of mass consumers, and whether marketing methods are appropriate, and other factors determine the success of cultural creative products. During this period, the uncertainty and risk involving more uncertain factors such as government policies and consumer market preferences, and the level of business operations have made the financing of cultural and creative enterprises faced difficult. China's animation industry is a very important part of our country's contemporary cultural and creative industry. Whether our country's animation industry can achieve a breakthrough under the current status quo is closely related to whether it can make full use of the opportunities that our country's contemporary cultural and creative industries are booming. Clearly, there are serious shortcomings in China's animation industry today. How to improve and solve these problems, the theoretical hints brought by the cultural and creative industries are undoubtedly a guiding light to guide China's animation industry out of the predicament [8].

Liu proposed an interactive method to describe computer animation data to speed up the animation generation process. First, he uses a semantic model and resource description framework (RDF) to analyze and describe the relationship between animation data. Second, to facilitate data organization and storage, he proposed a new context model that can maintain context awareness. In the context model, all main animation elements in the scene are operated as a whole. Then, he used sketches as the main interactive method to describe the relationship between animation data, and finally, generated a computer animation data description system based on sketch-based context perception and achieved good results in the animation generation process [9].

Maurya proposed a mixed reality system; he developed a system to simulate the interactive behavior of the product using the designed visual interaction block. His system is implemented in three phases: idea generation, creation of interaction, and modification of interaction behavior. The implemented virtual scene display inspires a high degree of motivation and attractiveness among users, and at the same time, brings a creative design experience. Therefore, designers will be able to create and modify their interactive behavior and design concepts relatively easily, resulting in higher concept generation and verification [10].

The most prominent fresh element of the cultural and creative industry is "innovation." How to innovate is the most important problem we need to solve urgently. Innovation is also the most important aspect of the cultural and creative industry. To fundamentally improve the level of Chinese animation culture and see the most positive and fresh animation elements, the talent training mode and the education mode of animation practitioners must be innovated in time. The old training and education mode has been difficult to keep up with the requirements and speed put forward by the contemporary cultural and creative industry for the animation industry. Most Chinese cartoons pursue educational significance in content, with obvious preaching color, lack of intimacy and childlike interest, lack of story, single structure, and unclear character of characters, which affect the audience's acceptance and love of domestic cartoons [11]. When creating stories, we should consider the real psychological and inner demands of the audience. When the audience appreciates cartoons or some comic work, most of the time, it is for rest and recreation. Too much preaching is bound to go against the original intention of the audience. Therefore, the key to improve the competitiveness of domestic animation and develop China's animation industry is to put people first, strengthen the originality of animation stories, vigorously improve the technical quality and artistry of China's animation, and enhance the attraction to the audience [12].

1.4. Promotional Paths and Methods of Film and Animation Interactive Products. This article analyzes and studies the flash interactive animation creation and design process. Through the animation creation and design principles of flash interactive technology, it discusses the types of characters and the mechanisms and conditions that meet the animation film technology in the experience, the animation and interaction in the product design and the realization of the story, the integration strategy of the story content and the screen, the method of animation design and other technologies are analyzed, and the functional modules of the production platform based on interactive film and television products are studied. Through this production platform, the production threshold of interactive film and television products will be greatly reduced, the production cycle will be shortened, and the production cost will be reduced. This allows traditional film and television production personnel to quickly transition to an electronic film and television production platform based on computer technology [13].

Before flash production, although there were many kinds of multimedia formats, the rendered files were often counted by 10 megabytes or 100 megabytes, and the high-precision short films even reached Gigabit. How to transmit and play the animation more quickly became a difficult problem at that time. Flash originally designed two-dimensional computer animation for the network. It is an animation programming language widely used on the Internet. Flash shock wave technology adopts streaming media to load and play, and users can download and play without waiting. The interaction technology of flash can achieve interaction by adding buttons to control various expression means. Any industry is inseparable from talent, and this industry is no exception [14]. Therefore, we must strengthen the education and training of talents to provide more high-quality talents for the development of the industry, to drive the progress of education. We can also say that talents are the fundamental driving force in industrial development. Developing cultural and creative industries is a new way for China to expand domestic demand, which is conducive to cultivating new consumption points and enhancing the pulling effect of consumption.

The development level of cultural and creative industry is closely related to the lifestyle of regional groups; so, it is conducive to stimulating domestic demand. At the same time, this industry is an important part of the service industry and can promote the rapid development of China's economy. Cultural and creative industries can play a leading role in promoting the innovation of traditional industries and driving the development of emerging industries. Cultural and creative industries have strong laterality and high correlation. They can integrate and develop with many other industries, promote industrial innovation and structural optimization, and point out the way for the development of some traditional industries. At the same time, the development of cultural and creative industries has also driven the development of a series of emerging industries such as animation industry, film, and television industry [15].

2. Overview of Virtual Animation Simulation

2.1. Development Status and Importance of Virtual Animation Simulation. Virtual reality animation is expressed in the form of animation using virtual reality technology. The rich sensory capabilities and 3D display environment make VR an ideal video game tool. Since the reality of VR is not too high in entertainment, VR has developed most rapidly in this area in recent years. In recent years, interactive mixed reality environments have been continuously researched and developed. The application of mixed reality technology in the field of display design allows visitors to interact in a combination of real and virtual environments and obtain virtual simulation scenarios through physical operations in the real world and exchange feedback with each other to achieve various display effects. The trend of interactive displays combining virtual and real is becoming clearer. Virtual and simulation are currently very popular forms of interactive display of products. The display technology of virtual simulation can create an unprecedented future and can also restore the past that has never been seen or cannot be forgotten [16].

The main purpose of Eviota is to verify the impact of inquiry-based teaching on students' physical performance through virtual simulation. He adopted a quasiexperimental design of pretest and posttest. According to three different teaching strategies, he divided the participants into three groups. He used the comparative analysis method and the F method to analyze the pretest and posttest scores of the three groups of students to determine whether there were significant differences in the performance of the students in physics concept learning before and after the use of the exploratory teaching method and virtual simulation teaching strategy. His research results show that inquiry-based teaching can enable students to acquire scientific concepts related to the content of physics teaching [17].

Yuan believes that informatization is an effective way to promote the reform and innovation of higher education and improve the quality of higher education. Virtual simulation teaching is an indispensable part of education informatization. He introduced the development and current situation of virtual simulation teaching and introduced the virtual human body system based on electronic standardized patient (ESP) powered by real-time human physiological parameters. He also discussed how to build an ESP-based community in human physiology teaching, preclinical comprehensive case study, and other teaching projects. Therefore, the virtual simulation teaching platform based on ESP is expected to become an important choice for the construction of first-class physiology courses [18].

2.2. Relationship between Virtual Simulation and Animation. The problem of reuse in virtual simulation refers to the need to make full use of various useful resources available in the field in the development and operation of virtual simulation applications to avoid repeated invalid labor. The problem of resource reuse in virtual simulation can roughly include two aspects: the reuse of simulation models and the reuse of simulation frameworks. Among them, the simulation model is the most core simulation resource, which directly affects the effect of virtual simulation, so it also has the most urgent need for reuse. Moreover, the reuse of the two is different. The latter has a clear interface syntax and functional semantics, coupled with the research of software resource reuse by researchers in the software engineering field, which has made a lot of results, and reuse is relatively easy. The development of standard metadata templates for meta-animation in virtual simulation is the first step for meta-animation management and reuse. The meta-animation metadata organized in a certain format can easily and quickly realize the access, combination, analysis, and management of the meta-animation. Establishing the description method of simulation meta-animation is to formulate the standard of meta-animation metadata, which is the basis of the entire meta-animation management [19].

2.3. Development Strategy of Virtual Simulation Products. The description specification of the simulation model is the agreement between the modeling and simulation activities. All simulation models have their description methods, and the evaluation of simulation model description methods can be considered from two aspects: friendliness and versatility. For model description, human thinking and computer processing are two extremes. Generally, the higher the abstract degree of the model description, the closer to the thinking mode of the modeler, and the better the user friendliness. Therefore, in the design of the description method, the core principle is to increase the level of abstraction as much as possible while ignoring the technical details of computer-oriented implementation. However, different fields have different abstract characteristics and description requirements. As the level of abstraction increases, the versatility of description methods gradually decreases. The description methods that are most friendly to a specific field are often difficult to apply in other fields. In the face of multidomain model description requirements, there is a tradeoff between friendliness and versatility [20].

2.4. Promotion and Marketing of Virtual Simulation Products. Through these functions, the access request proposed by the man-machine interface of the shell can be used

to access the model database and model files. These interface relations play an important role in the resource library. Only through these interface resource libraries can it interact with the simulation application system. Without these interfaces, the resource library will not be able to provide services and simulation applications will not be implemented. For different simulation application systems, due to different service requirements, the interface design may also be different. However, in general, these interfaces of the resource library are realized through the system soft bus in the simulation application system [21].

The resource library is a warehouse that stores and manages various simulation models, meta-animations, and related data in the simulation system and provides reusable simulation resources for analysis and simulation application development. In the design process, the access and update process of the resource library should be simplified as much as possible. The resource library management module is mainly responsible for the maintenance and management of models, meta-animation databases and models, meta-animation libraries, and related data. The resource library management module interacts with the model, the model in the meta-animation library, and the meta-animation file through the functional interface of the model, meta-animation database and model, and meta-animation file, and reads or writes the model, meta-animation file, and related data. The basis of resource management is to categorize resources. By establishing a classification list of models and meta-animations, the management operations of different models and meta-animations are realized [22, 23].

3. Analysis and Practice of Vision Sensor and Virtual Simulation Technology

3.1. Overview of Vision Sensors

3.1.1. Overview of the Development of Vision Sensors. With the development of electronic technology, there has been a trend of simultaneous development and integration of PC and embedded systems in the information age. In some special occasions, embedded systems can better adapt to the changing requirements of the scene, and increasingly, the processing system begins to use the embedded system to complete the intelligent control, especially in the occasions of small size, low power consumption, and distinct modularization. Combining the small-scale intelligent processing system with the visual processing technology, the intelligent digital visual processing system appears. At present, under the demand of automated industrial detection and control, the intelligent digital visual processing technology has achieved unprecedented development [24]. After the sensor system receives the acquisition and processing instructions from the measurement computer through the field bus, it will continuously acquire images and apply relevant machine vision algorithms to process the acquired images. Image processing is mainly a template matching operation, according to the working characteristics of the flexible sensor [25]. A sensor needs to measure multiple feature points correspondingly; then, the matching template of each point is stored in the static storage system in advance, the template file is named in the order of the trajectory of the measurement point, waiting for the program to be called, and finally the result of the processing is the image pixel coordinate value upload. In the data management system of the measurement computer, after each instruction task is completed, the visual sensor embedded system will feed back a state instruction to the measurement computer according to the current state [26].

3.1.2. Vision Sensor Technology Progress Node. With the rapid development of portable multimedia terminals and security technology, higher requirements have been put forward for video decoding chip technology. High-performance and highly integrated video decoding chips are emerging in an endless stream, providing a good solution for embedded video acquisition systems. The video decoder chip is an A/D converter of the video signal. The selection of A/D converters is mainly based on factors such as accuracy, speed, whether a sample-and-hold circuit is needed, range, and input and output port types. The accuracy reflects the accuracy of the actual output of the converter compared to the ideal output [27].

According to the consideration of machine vision image processing accuracy, it is necessary to choose an A/D converter with medium resolution; that is, the number of bits is between 9 and 12. The sampling rate is mainly determined by the sampling theorem. The target system is the analog-to-digital conversion of the analog video signal CVBS. The customizability of the video decoder chip selected has already met the sampling frequency of the existing commonly used analog video signals. Finally, the input signal provided by the vision sensor to the video decoder chip is the CCIR analog video format output by the industrial camera, and the output digital video format is ITU-BT601. In addition, due to the size and power consumption of the visual sensor, it is necessary to choose a video decoder chip with high integration and low power consumption. Because the system is applied to the industrial field with a long transmission distance, an isolation transformer is needed to enhance the differential signal sent by the PHY and then couple it to the other end of the network cable connection. Since the isolation transformer isolates the board-level transmission system from the outside world, it can also prevent electromagnetic interference in the environment. Finally, the information is transmitted to the on-site industrial computer through the Ethernet universal interface RJ-45 and the network cable. Since the system will be applied to the industrial field, both the Ethernet interface and the Ethernet transmission line need to use industrial-grade products to ensure the reliability of the transmission [28].

3.1.3. Visual Sensor Characteristics and Interactive Design Ideas. In terms of system processing methods, the intelligent digital vision sensor of each measurement node can complete the image processing task separately. The method of collecting multiple images for processing and then averaging can be used to improve the accuracy. Generally speaking, this processing method realizes distributed processing,

reduces the dependence on the measurement computer, and improves the real-time performance and stability of the system. In terms of signal transmission paths, the video image information has been processed at the measurement node and converted into useful signals with a small amount of information. It can be transmitted directly using the communication network in the form of digital signals, and no independent analog video transmission bus is required. The result is less information, and digital transmission is realized, which improves the system's anti-interference ability. In terms of multinode communication, the digital vision sensor uses an industrial Ethernet communication network, and the measurement nodes will not affect each other when communicating. Multiple measurement nodes can communicate with the measurement PC at the same time. The communication network has high stability, good flexibility, and software layer. The protocol is relatively mature and user-friendly. The visual sensor architecture is shown in Figure 1.

The vision sensor is not an independent working machine and equipment, and it is often installed on various other machines to play its role. Its main function is to collect various types of visual information and then transmit the information to the machine and equipment that needs it. The vision sensor is usually consists of one or more graphic sensors, and these graphic sensors work together to ensure that the visual sensor completes the work [29]. In the digital signal distributed visual inspection system, the sensor collects images and completes image processing for rough positioning of features. The results are uploaded to the measurement computer, and the measurement computer is responsible for database building, compensation, correction, and data comparison. The traditional analog vision sensor is based on the triangulation method, using a laser to generate structured light and LED array to adjust the background light, the camera receives the reflected light spot and completes the image acquisition, and the measurement PC performs image processing and coordinates settlement to complete the monocular vision measurement.

The system signal processing flow designed in this paper is shown in Figure 2. When the system is started, the CPU reads the startup information from NAND flash to ram, including the template information to be used in image processing. The measurement computer notifies the CPU to start measurement through Ethernet, and the CPU sets the working mode of the video processing module and image acquisition module, controls the laser and LED switch, and starts data acquisition. The image acquisition module starts scanning and outputs bt656yuv422 interleaved format data. The video processing module takes the field synchronization signal as the mark of the beginning of a frame of image. After receiving the image, it performs bt656 decoding, color space conversion, extracts brightness and color difference signals, and stores them separately. The storage mode is DMA. Four frame buffers are opened in RAM to complete ping-pong operation. The video processing module continuously writes data to the ram frame buffer and updates it in real time. At the end of each frame of image acquisition, the video processing module notifies the CPU in the form of interruption. The CPU extracts the image brightness signal as required, pauses the data update function of the video processing module during the signal extraction process, turns on the function after the signal extraction is completed to prevent one frame of image data from being modified during the extraction process, and uses the template matching method to complete the image processing. The position coordinates of template features in the whole image are obtained, and the node information and image coordinate information are packaged and sent to the measurement computer through Ethernet to complete the measurement of a node.

Three-dimensional animation simulation technology is based on the development of computer hardware technology. It is based on numerical simulation. It generates realistic visual effects through graphics and animation and realizes real-time animation simulation. In some large-scale buildings or urban planning, three-dimensional animation technology can simulate intuitive and real scenes before implementation, so that we can appreciate the effects of the project in advance.

Define the normalized crosscorrelation coefficient by removing the mean value:

$$\rho(u,v)=\frac{\sum_{x=1}^{m}\sum_{y=1}^{n}\left[D_{(u,v)}(x,y)-\overline{D_{(u,v)}}\right]\times\left[T(x,y)-\bar{T}\right]}{\left\{\sum_{x=1}^{m}\sum_{y=1}^{n}\left[D_{(u,v)}(x,y)-\overline{D_{(u,v)}}\right]^{2}\right\}^{1/2}\times\left\{\sum_{x=1}^{m}\sum_{y=1}^{n}\left[T(x,y)-\bar{T}\right]^{2}\right\}^{1/2}},\tag{1}$$

where

$$\overline{D_{(u,v)}}=\frac{1}{mn}\sum_{x=1}^{m}\sum_{y=1}^{n}D_{(u,v)}(x,y),\tag{2}$$

$$\bar{T}=\frac{1}{mn}\sum_{x=1}^{m}\sum_{y=1}^{n}T(x,y).\tag{3}$$

$\rho(u,v)$ describes the degree of correlation between the search subimage and the gray values of all pixels in the matching template. The closer $|\rho(\mathrm{u},\mathrm{v})|$ is to 1, the better the matching degree between the search subimage and the matching template, so choose $|\rho(\mathrm{u},\mathrm{v})|$, and the largest point (u, v) is regarded as the best matching point.

$$T_0(x,y)=T(x,y)-\bar{T},\tag{4}$$

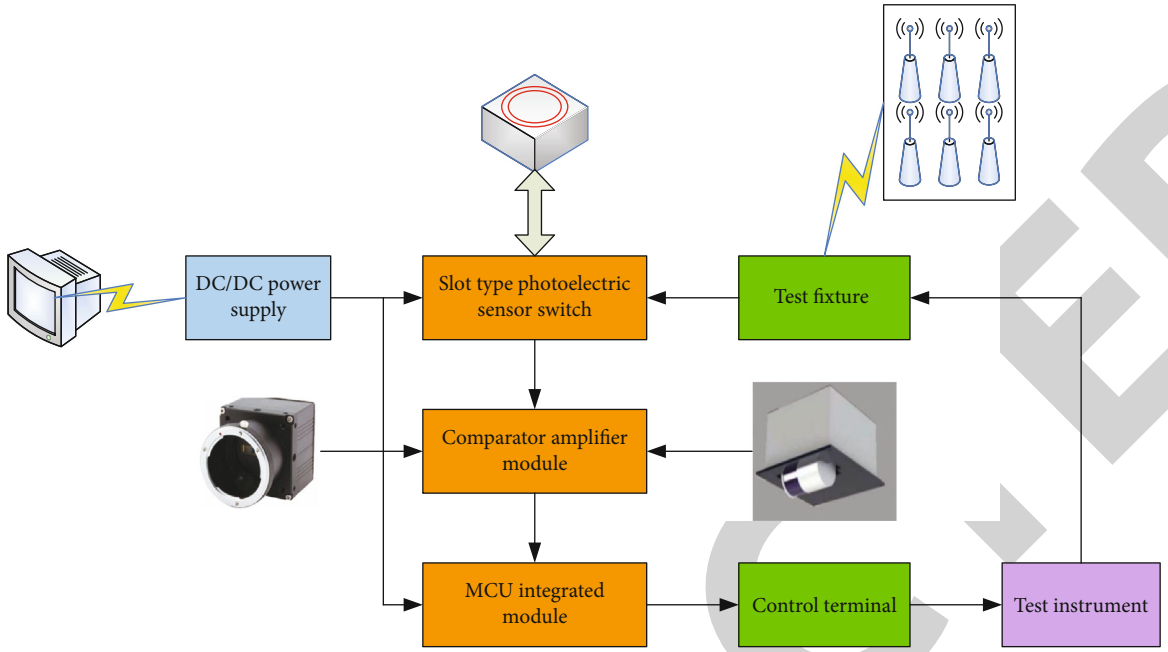

Figure 1: Vision sensor architecture.

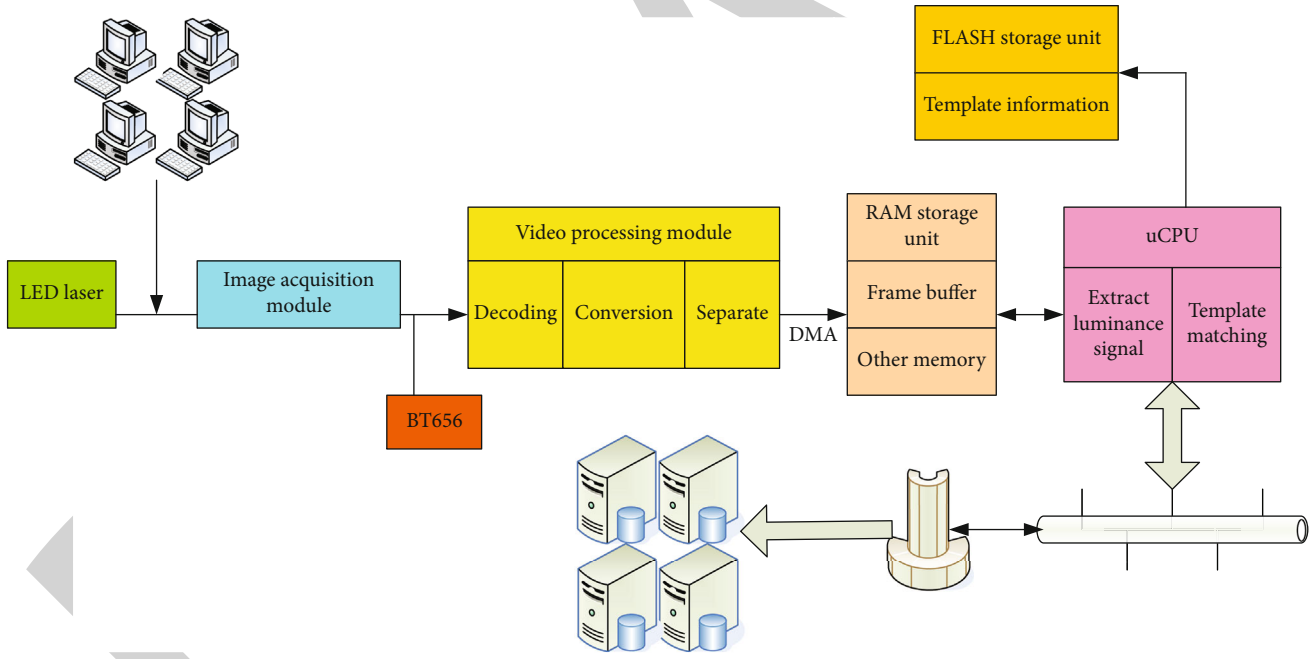

Figure 2: The system signal processing flow designed in this article.

$$F_T = \left\{ \sum_{x=1}^{m} \sum_{y=1}^{n} \left[T(x,y) - \bar{T} \right]^2 \right\}^{1/2}. \quad (5)$$

Therefore, when the matching algorithm is executed using the template information, the stored data can be directly extracted without calculation, thereby reducing the amount of calculation and improving the calculation speed.

Absolute error is as follows:

$$\varepsilon_{(u,v)}(x,y) = \left| \left[D_{(u,v)}(x,y) - \overline{D_{(u,v)}} \right] - \left[T(x,y) - \bar{T} \right] \right|. \quad (6)$$

The gray scale sum of all pixels in each column of the search subimage to be matched $D_{(u,v)}$ after removing the mean value is as follows:

$$V_{(u,v)k} = \sum_{x=1}^{m} \left[D_{(u,v)}(m,k) - \overline{D_{(u,v)}} \right]. \quad (7)$$

Among them, $k = 1, 2, 3, \cdots, n$. Then, the one-dimensional projection crosscorrelation coefficient is

$$\rho(u,v) = \frac{\sum_{k=1}^{n} V_{(u,v)k} \times T_k}{\left\{ \sum_{k=1}^{n} V_{(u,v)k}{}^2 \right\}^{1/2} \times \left\{ \sum_{k=1}^{n} T_k{}^2 \right\}^{1/2}}. \quad (8)$$

The TCP protocol is transmitted in batches through the TCP_STREAM instruction. During the test, the client sends batches of TCP data packets to the server to determine the throughput of the network system. The test results are shown in Table 1. According to the onsite transmission situation, the test experience time is set to 180 seconds, and the system response has a millisecond error. A total of 30 experiments are performed. The table shows the results of the 7 experiments, which includes the maximum throughput of 35.14Mbits/s and the minimum throughput is 35.04Mbits/s, and the average throughput is 35.09Mbits/s, which is far greater than the amount of data transmitted by the online detection system.

The impact of optimization methods on real-time performance is shown in Table 2. The influence of optimization method on robustness is shown in Table 3. The optimized NNPROD has the same robustness as the traditional NNPROD, but the matching time is greatly reduced, and the robustness and real-time performance are both at a high level. The time to complete a frame of image matching is 135 ms, and to complete a feature measurement, 8 frames of images need to be used for template matching, and then the average coordinate value is calculated, which takes about $135 \times 8 = 1080$ ms, which meets the system requirements.

To facilitate the calculation of the data and ensure the accuracy of the data, the flow measurement method adopted in this research is optimized and combined with the visual sensor for research. The normalized product correlation algorithm for removing the mean controls the scale of each feature in the same range, which can facilitate finding the optimal solution.

3.2. Overview of Virtual Simulation Technology

3.2.1. Explore the Development of VR-AR-MR. For product design, the relationship between product manufacturers and users also needs to be clear. The function-oriented product design process will analyze and provide services on a peer-to-peer basis, including the relationship between product manufacturers and users, information exchange, and organizational standards. By integrating all service characteristics into the product design process, a systematic service design process can be obtained. Finally, user-oriented requires the integration of the two processes by analyzing overlapping parts, integrating organization and information exchange.

Virtual reality is a computer system that can create and experience a virtual world. It is composed of computers, sensors, and other related software and hardware devices. It acts on users through sight, hearing, touch, smell, etc. and brings users an immersive feeling. Immersion, interactivity, and conceptualization are the three basic characteristics of a virtual reality system. Interactivity refers to the ability to interact with virtual world objects generated by computers in a convenient and natural way with the support of interactive devices, through the user and the virtual environment, the two-way perception between the two establishes a natural and harmonious human-machine environment; so, the interactive design is the core link of the application of virtual reality.

Augmented reality (AR), also known as augmented reality, is one of the research hotspots of many well-known foreign universities and research institutions in recent years, and it is an emerging research field developed on the basis of virtual reality technology. Augmented reality technology and augmented virtual technology together constitute the core content of mixed reality technology. Augmented reality is a technology that organically integrates computer-generated graphics, text, and other virtualized information into the real-world picture that the user sees and enhances and expands the picture that the human eye sees. Augmented reality solves the problem of how to enable humans to obtain information that is not perceptible to humans under normal circumstances. It can display information in the real world, and more importantly, it can display virtual additional information at the same time. The two are in the same picture. Superimpose each other, complement each other, and finally achieve the effect of complementing each other.

At present, most of the mixed reality display technology is the combination of live activities and online communication, virtual display supported by real landscape and new media technology, real-time signals of the physical world, and virtual information generated by artistic processing. Mixed reality display technology is being valued by people for its diversified and varied forms and multifield and multipurpose applications, whether it is product display, product marketing, TV broadcast, live entertainment or museums, art galleries, and other exhibition venues. These show that the mixed reality display technology is developing divergently and forwardly in the ascendant.

3.2.2. Product Form and Interaction Design. The image sensor can use a laser scanner, a linear and area CCD camera, or a TV camera, or the latest digital camera. The vision sensor has thousands of pixels that capture light from an entire image. The clarity and fineness of an image are usually measured by resolution, expressed in the number of pixels. After the vision sensor captures the image, the vision sensor compares it with the reference image stored in the memory for analysis. Product design is not just about designing the product itself. Designers pay more attention to the form, function, and processing of products, ignoring the human factor. To a certain extent, human beings as users of products are not less important than researching the products themselves. Thinking and researching with people puts forward new guidelines for product innovation. The development process of innovative products has evolved from the

Table 1: Batch network traffic measurement results.

Result	1	2	3	4	5	6	7
Recv socket size (bytes)	87380	87380	87380	87380	87380	87380	87380
Send socket size (bytes)	16384	16384	16384	16384	16384	16384	16384
Elapsed time (secs)	180.01	180	180.01	179.99	180	179.98	180
Throughput (bits/sec)	35.04	35.14	35.04	35.07	35.1	35	35.05

Table 2: The impact of optimization methods on real-time performance.

Time/ms	480×640	360×360
Before optimization	3100	1050
Optimized	215	135

previous technological lead to the processing follow-up into conceptual innovation, technical support, and follow-up advancement. The importance of conceptual innovation and design has received unprecedented attention. Conceptual innovation design is essential in the entire product design process. Under the trigger of a good concept, combined with related technologies, conceptual products have become the core competitiveness of an enterprise.

In the actual operation of the thinking mode of deductive reasoning, the basis of the major premises and minor premises depends entirely on the personal experience, perspective, and process, and individuals differ greatly in these reasoning processes. To achieve a certain goal, the process of each person's establishment is not exactly the same; so, just like a designer designing according to his own experience and habits, it often does not conform to the user's way of thinking and reasoning. In different societies and different parts of our society, people have different needs for privacy. However, in general, a certain degree of privacy is needed by almost everyone. Environmental psychologists try to meet this need through architecture. For example, in a large office environment, we use compartments or walls instead of open designs, so that the monitor cannot directly see the employees. People find that this will result in greater job satisfaction and higher, rather than lower operations.

3.2.3. Technical Features and Interactive Design Ideas of Existing Equipment. Interactive augmented reality technology is another hot spot of recent research. People are no longer satisfied with simply superimposing virtual information into the real world and begin to seek the application of augmented reality technology in virtual-real interaction. The main method is to realize the interaction by tracking the position and posture of multiple real objects and through the relationship between the position and posture of these real objects and the position and posture of virtual objects, triggering action events and driving the virtual objects to change. In the concept formation stage of product innovation design, and even the later design stage, many people did try various methods, trying to find methods that were unfamiliar before.

In most companies, one or more methods of needs' assessment are used, and one of the methods of group creativity is often supplemented to adapt to various situations. Planning analysis is particularly effective for long-term incentives. When the normal system encounters unexpected difficulties and requires a completely different method to break out of the dilemma, attribute analysis and correlation analysis become very useful. We cannot determine the exact conditions for each method. Experience tells us that the method depends to a large extent on the individual; so, it is difficult to determine the applicable conditions. Under the same conditions, different people will adopt completely different methods. Even if the task is the same, everyone will find the method he thinks is suitable from all methods, and can make quick judgments about the most effective method. Using these methods as tools to stimulate creativity may be more appropriate for product innovation design.

3.3. AR and MR Product Development Practices

3.3.1. AR Product Development Practice. The product design of the system leads to different product variants, which are implemented through a series of services. Products and services can be integrated according to the classification of customers and are no longer independent individuals. The focus of attention is still the material product, but the realization of the function depends on the support of the service. The product service system proposes user-oriented solutions and customer-centric production concepts. Traditional product-oriented companies pay attention to product quality and the realization of basic functions, while function-driven companies provide more differentiated services to meet basic functions and service requirements. In addition to satisfying these external functions, user-driven companies understand the importance of users' potential information, integrate services and product design closely, and provide diversified services to meet the different needs of users.

3.3.2. MR Product Development Practice. The history of product display design has always been developed along the trajectory of combining art and science. It takes science as the functional basis and art as the form of expression, making it both practical and aesthetic. Mixed reality product display technology creates new opportunities for breakthroughs in this situation. The combination of virtual and real allows the display form to freely shuttle and change between virtual and real, combining various forms of virtual and real, real and virtual, and virtual and real, which provides a large creative space and unlimited possibilities for the development of new product displays.

Table 3: Impact of optimization methods on robustness.

Match position	The original image	Salt and pepper noise variance				Lighting changes
		0.02	0.04	0.05	0.06	
Before optimization	(60, 80)	(60, 80)	(60, 80)	(60, 80)	(61, 81)	(60, 80)
Optimized	(60, 80)	(60, 80)	(60, 80)	(60, 80)	(61, 81)	(60, 80)

At the moment when the world is calling for the concept of low-carbon and environmental protection, the product display industry is constantly developing in the direction of low-carbon, environmentally friendly, and green intelligent design. The application of mixed reality product display technology can use the same display device to achieve reuse and long-term use by replacing digital information such as media, images, or upgrading and updating local equipment, truly realizing the sustainable development of low-carbon and environmental protection, and it greatly reduces the waste of earth resources in the production of props in the traditional product industry.

Adjust the control coefficient of PD servo based on the principle of stability control, to generate a suitable torque to drive the joint movement. Its expression is as follows:

$$\tau = k_s(q_{\text{des}} - q) - k_d q. \tag{9}$$

Among them, k_s represents the stiffness coefficient, and k_d represents the subdamping coefficient.

To achieve PD servo stability control, we use critical damping to establish the relationship between the stiffness coefficient and the damping coefficient in PD control. The formula for the damping ratio is

$$\xi = \frac{c}{c_c} = \frac{c}{2\sqrt{\text{mk}}}. \tag{10}$$

Among them, c_c is the critical damping, m is the weight of the vibrating object, and k is the stiffness coefficient of the vibration system.

Since the original acceleration output of the sensor includes a gravity acceleration, and the hardware circuit will have a certain trend item in the A/D conversion process, this is defined as the DC component of the signal. The DC component is not eliminated in the coordinate transformation. However, the DC component needs to be removed before integration. The usual approach is to find the mathematical expectation of the signal to approximately replace the DC component, as shown below:

$$\bar{x} = \frac{1}{N}\sum_{i=1}^{N} x_i, \tag{11}$$

where x is the input signal, N is the length of the input signal, and $\bar{x}$ is the mathematical expectation of the signal.

The combined speed is as follows:

$$v(i) = \sqrt{v_x(i)^2 + v_y(i)^2 + v_z(i)^2}. \tag{12}$$

Let $y(i)$ be the angular velocity and use the trapezoidal integral to find the angle. The angle calculation formula is as follows:

$$\varphi(i) = \varphi(i-1) + \frac{1}{2 \times Fs} \times [y(i-1) + y(i)]. \tag{13}$$

The angular acceleration formula is as follows:

$$a(i) = Fs^*[y(i) - y(i-1)]. \tag{14}$$

At time t_k, the brightness increment measured by the sensor is

$$\Delta L(u_k, t_k) = L(u_k, t_k) - L(u_k, t_k - \Delta t_k). \tag{15}$$

When the window moves $[u, v]$, the grayscale change of the pixels in the corresponding window before and after the sliding of the window is defined as

$$E(u, v) = \sum W(x, y)[I(x + u, y + v) - I(x, y)]^2. \tag{16}$$

In the formula, $W(x, y)$ represents the window weighting function, usually Gaussian distribution.

Regarding the selection and improvement of weights, it mainly focuses on spatial correlation and gray correlation. For example, considering that the real pixels of the image have great spatial correlation, weights related to distance can be used, such as

$$w(x, y) = \frac{1}{\sqrt{(x - x_0)^2 + (y - y_0)^2}}, \tag{17}$$

$$w(x, y) = \frac{1}{2\pi\sigma^2} e^{\frac{(x-x_0)^2 + (y-y_0)^2}{2\sigma^2}}. \tag{18}$$

The direct crosscorrelation coefficient can be calculated by transforming the image from space to frequency domain by fast Fourier transform, which greatly reduces the multiplication and addition operations in crosscorrelation matching.

$$T_F(u, v) = \text{FFT}(T(x, y)), \tag{19}$$

$$I_F(u, v) = \text{FFT}(I(i + x, j + y)), \tag{20}$$

$$\sum_x \sum_y T(x, y) I(i + x, j + y) = \text{FFT}^{-1}(\text{Corr}(u, v)). \tag{21}$$

3.4. VR Product Interaction Design and Development Practice

3.4.1. Case Analysis of Existing VR Products. At present, virtual reality application carriers mainly focus on Htcvive and some mobile VR devices. Htcvive has the functions of display, interactive input, and interactive output and does not have the ability of picture rendering. Through the GPU unit of the high-performance computer, the picture is calculated and output to the Htcvive head display for picture display. It has the advantages of high picture quality, high refresh frequency, rapid response, and accuracy. At the same time, it is also subject to the disadvantages of relatively fixed place of use, relatively heavy equipment, and high space requirements. Htcvive handle can provide an accurate and fast response for interaction through radar lighthouse positioning. It will be used as a carrier for applications with high experience requirements and low portability requirements. The mobile terminal device takes the mobile phone as the carrier of rendering, display and interactive input and output. It has the advantages of portability and low cost. At the same time, it is subject to the disadvantages of low computing performance of the mobile phone. The mobile terminal virtual reality device has some problems, such as poor picture quality, easy dizziness, and single interaction.

3.4.2. Overview of VR Product Interaction Design. To meet the needs of various users of virtual reality, the entire platform system must have the necessary basic functions such as interaction, immersion, and imagination to realize the user's autonomous behavior in the virtual space. In the past, users observed the calculation results of the computer from the outside, and now, users can feel in the virtual world; in the past, users generally used the mouse and keyboard to communicate through one-dimensional and two-dimensional digital information, and now, users can use sensors or 3D graphics, etc. to communicate with each other: in the past, users deeply understand and recognize things relying on the fixed results of computer calculations. Now, users can be in the virtual world and inspire new inspiration to look at things. In summary, the goal of virtual reality in the future will enable this application system to satisfy human life to a greater extent and fundamentally change the way that humans use fixed information to perceive things.

3.4.3. VR Product Development Practice. In the virtual space world, the interaction between the space environment and various things and various applications will produce result output and terminal inputs. The platform will process various terminal input and output feedback results, thereby presenting the corresponding terminal scenes. There are currently two situations in the human-computer interaction generated during the operation of the platform: one is that the user selects things or behaviors in the virtual space through the terminal device, and the other is to find the direction and location through the terminal device. The data in the virtual reality system are all existing data types, mainly for the management of text data and binary data. For managing text data, its main function is to manage data. The function of virtual reality scene binary data is to provide data for audio and video streams and 3D models.

3.5. XR Product Development and Expansion

3.5.1. Motion Capture. XR technology can use sensor technology to transform those things that we cannot directly perceive into the range that we can perceive in some form and then stimulate our senses through corresponding perceptual feedback devices, such as force feedback devices and tactile feedback devices. Let us produce the corresponding perceptions and further allow us to recognize things that we could not directly perceive before in a more intuitive way. In other words, XR technology greatly expands the range of human sensory perception. During the XR experience, the XR system needs to sense the changes in the position and posture of the experiencer in real time, adjust the corresponding feedback device in time, to stimulate the senses of the experiencer properly, then bring sensory immersion to the experiencer, and further rise to psychological immersion.

3.5.2. Face Capture. Gyroscopes are usually used in 3-DOF devices to measure the orientation parameters of the XR head display worn by the experimenter. High speed gyroscopes are built in these devices. The high-speed gyroscopes have the characteristic of keeping the direction of its rotation axis unchanged in the XR virtual space. The higher the rotation speed of the gyroscope, the better the stability of its direction. Therefore, when the experimenter's head rotates, it shows that the experimenter's orientation changes, and the included angle between its orientation and the gyroscope direction also changes. The change of the angle is decomposed into three coordinate axes of the virtual spatial coordinate system (α, γ, β), with the change of three degrees of freedom. At this time, we only need to obtain the changes of these three degrees of freedom according to a certain sampling frequency to track the changes of the experimenter's head orientation in real time.

3.5.3. Eye Movement. To let users feel the realism of the virtual environment, the graphics quality and real-time performance of the graphics output device are decisive issues, but it takes a long time to calculate the realistic 3D virtual scene, and the requirements for graphics technology are very high. It can be seen from the past project experience that the main technical bottleneck of real-time visual simulation is to meet the speed of graphics generation. The speed of generating visual simulation graphics is mainly restricted by two aspects. In addition to the software and hardware architecture of graphics processing, it is also determined by the scene complexity of the program application, the composition factors, and the final fidelity of the graphics. This technical solution allows users to use graphs as a data structure to describe the entity model in the scene, so that entities with certain attributes can be placed in the group, and then the common attributes of the entire group can be changed somewhere. The scene library can achieve automatic background management, such as real-time drawing of the detailed model required in the current scene, and automatically remove those unimportant details that reduce the real-time response of the scene display.

The eye movement experiment data is shown in Figure 3. It can be seen from the results of the eye movement

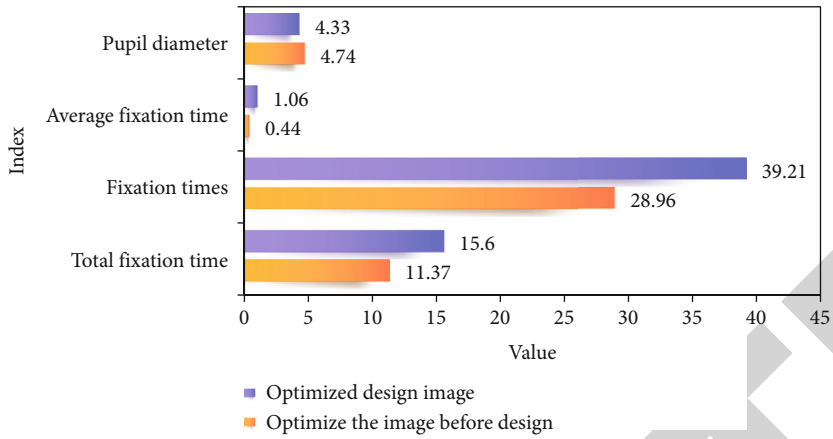

Figure 3: Eye tracking experiment data.

experiment that the longer the total fixation time and the more fixation times, the more attractive; the larger the pupil diameter, the worse the image quality and the harder it looks. Therefore, the subjects pay more attention to the image after the optimized design, and the image quality is better than the image before the optimized design.

Let the user watch a short film composed of virtual reality technology, and the visual sensor records the user's relevant situation in the process. Adjust the relevant data of the subject's eye movement by adjusting the texture of the image. The test results found that the gaze duration varies with the quality of the image, and the gaze duration of the same image is the longest 39.21.

4. Practical Production of Maya-Unity Software

4.1. Summary of Case Development of Animation Simulation Products. Animation uses a variety of visual art forms as its expression language. This unique form of expression has been appreciated by the public, making it a new form of product display and promotion. The combined application of computer science technology and visual art makes the product display animation have a more powerful visual impact. No matter which method you choose, you must always adhere to the design intent of the work performance; that is, the designer must convey the design concept to the user. The design intent is deviated and even the gap is large. Formulating a detailed performance program plan can have a very good control effect on the visual presentation of design intent, and an accurate expression method can achieve a multiplier effect with half the effort. When considering the characteristics of product display, design intent, and means of expression, if you choose a static picture to represent the product, you can choose the most appropriate rendering of the material effect, section effect, explosion effect, and use state effect. At the same time, different display objects should be treated differently, and different display schemes need to be tailored to various user needs.

4.2. Overview of Maya-Unity Animation Production Software

4.2.1. Three-Dimensional Animation Production Software Maya. MAYA Software is a well-known 3D modeling and animation software owned by Autodesk. Autodesk Maya can greatly improve the workflow efficiency of development, design, and creation in the fields of film, TV, and games. At the same time, it improves polygon modeling and improves performance through new algorithms. Multithread support can take full advantage of multicore processors., the new HLSL shading tools and hardware shading API can greatly enhance the appearance of a new generation of console games, and it is also more flexible in character creation and animation. Three-dimensional animation design, as the mainstream design and production of today, is a product of the digital age and is an extension of computer technology. The purpose is to present a three-dimensional virtual space in the form of a short film as much as possible. With the improvement of quality, the sensory effects become increasingly delicate, attracting more fans, and better promotion and development of 3D animation design. With the continuous updating of computer hardware technology, the craftsmanship of 3D animation production is also becoming increasingly perfect, and the development space is getting wider and wider. To meet the high-end aesthetic needs of more customers, interdisciplinary and multidisciplinary professional collaborative design has been promoted by the designer.

4.2.2. Real-Time Interactive Platform Unity. A screenshot of the movie Big Hero 6 is shown in Figure 4. This is a typical interactive way that virtual characters cooperate with virtual objects. The so-called virtual characters do not exist in the simulation animation as the main display product. This requires the user to manipulate the virtual objects in the video as a virtual protagonist. For example, when a user is browsing a web page, the various functions of the web page will be explained one by one using input devices such as a mouse and keyboard. The whole website content is displayed on the screen, the interactive behavior in the whole process is a virtual interaction, and it is the script content that has been set. Here, you can simply replace the website content display with the product display for thinking. The use of AE for video production is to imitate the film-level special effects performance to simulate this process.

Figure 4: Screenshot of the movie Big Hero 6.

In film and television animation videos, animation is the soul of the work. The characters can only come alive when the animation is convincing. Animation generally first records the actions performed by real people and then starts an animation based on the real actions. The progressive grid information is shown in Table 4. As it can be seen from the following table, after adopting the progressive grid data structure in this paper and packaging to generate the Asset Bundle package, its file size is reduced several times compared with the uncompressed progressive grid data file size directly used by MultiRes3d.

Progressive web is a progressively enhanced web app that is closer to the native user experience, evolved from the browser, immersive experience, improved web performance, etc.

4.2.3. XDreamer Software Based on Unity Platform. The scene view displays the document from a graphical perspective, while the code view displays the text content of the document. Both views must be displayed in the split window XDreamer, and only one view can be displayed at the same time; so, it is necessary to establish a button for scene and code switching. The switching process can be realized by dynamic creation and destruction, or by hiding the view. Considering the execution efficiency of the program, if each switch has to go through the process of creation, initialization, and destruction, the system needs to access the memory frequently, which consumes more CPU time, and the view hiding method requires the creation of two views at the same time, but the view does not take up too much memory space. Figure 5 shows the time-consuming situation

Table 4: Progressive grid information.

Model faces	Vspl number	Progressive grid file size (KB)	Asset bundle size after reorganization (KB)
580	2611	489	123
806	3625	689	177
6962	31334	6489	1694
10000	44984	8991	2336
10004	45015	9362	2327

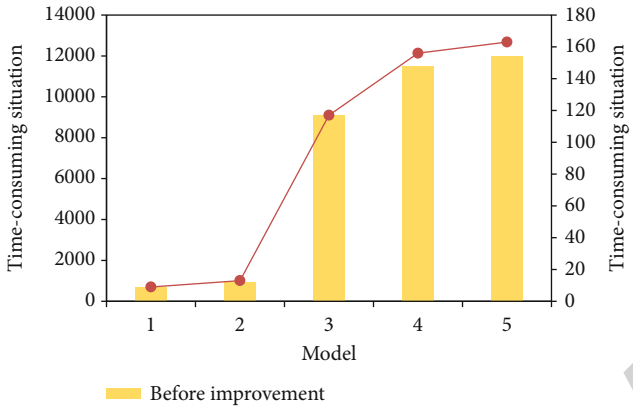

Figure 5: Progressive grid loading is time-consuming before and after improvement.

of progressive grid loading before and after the improvement. Before improvement, MultiRes3D needs to read the original unprocessed progressive mesh file and convert each character; so, its loading efficiency is extremely low.

The above figure is based on the statistical data of the progressive grid loading time-consuming data before and after the improvement. On the whole, the grid loading time has been reduced after the improvement. The evaluation data is shown in Figure 6. Due to time constraints, only 20 users were tested. The user experience experiment test materials are mostly case materials with relatively high accuracy. According to the average value of the test, it can be seen that the overall video solution is at a high level, taking into account the special environment of the Chinese Acadeour of Sciences. According to the demand, the picture is not easy to be too gorgeous, and the overall level plan A is high, but some details still need to be improved and fine-tuned. Product display animation design needs to be further refined, optimized, and perfected continuously, and its usability and guidance effect should be increased as much as possible, to be suitable for the design and production of various project plans.

4.3. Maya Scene Design and Production

4.3.1. 3D Software Installation and Basic Operations. The production of three-dimensional animation short films is initiated by the script, and the role designation appears in mind simultaneously. The producer needs to work with the designer to outline it. This kind of model is not only a basic model in 3D software, but also skinning the model, adjusting the lighting, rendering test, adjusting the bones, and binding the actions before rendering. After finishing the above work, we will combine all models together and start the traditional short film production, that is, nonlinear editing, color toning, adding special effects, and finally synthesizing the product.

4.3.2. Maya Scene Model Making. The whole production is mainly divided into three stages. The initial stage is to make the model in the software, and the animation's split mirror was born simultaneously. In the process of texture skinning and frame binding of the model, the texture map of the scene is also produced, and at the same time, the split mirror. The evolved storyboard is also almost designed and produced; the second stage needs to refer to the design of the storyboard, integrate the model with the scene model, and use a single frame to check the production of the primary model stage: the final stage is the most complicated. It is also the one that needs the most patience. After modifying and confirming the final model, start to design and produce the action, complete the preliminary animation settings, prerender the animation, if there is no error, perform postproduction, and finally output the finished product.

The data statistics under 7 kinds of experimental conditions are shown in Table 5. The main effect of text effect is very significant, $F = 13.780$, $P < 0.001$; comparison of effect between development and middle to two sides, $P = 0.02$, $P < 0.05$; comparison of line-by-line and middle to two sides, $P = 0.033$, $P < 0.05$; comparison of effect from right to left and middle to both sides, $P = 0.043$, $P < 0.05$; and pairwise comparison in other cases, $P > 0.05$. The standard deviation is too large, there are two effects, from top to bottom and developing, and the effect with the smallest standard deviation is from right to left. The above results show that only the performance from right to left and other effects is very significant and the effect performance of development and middle to two sides, line by line and middle to two sides, right to left, and middle to both sides decreases in order. The viewpoints on the top-down and development effects are quite different, and the viewpoints on the right-to-left effects are relatively small.

4.3.3. Maya Scene Materials and Textures. Physicalize 80 program textures show very real effects. The depth of the field channel and environmental isolation effects can also be displayed directly in the window. The new motion trail editing function allows you to animate paths without opening the graphics editor. The material is the same as the human skin. In the production of 3D animation, the presentation of each object has a certain texture. This requires that in the selection of materials, and it is necessary to pay attention to the properties of the selected materials and to highlight the personality of things through these properties. After all, soft and hard are not the same, and texture exists. When the model is given a material, combined with the lighting and the environment map, the material will respond accordingly, and the characteristics of the material itself will show different colors, environment colors, transparency,

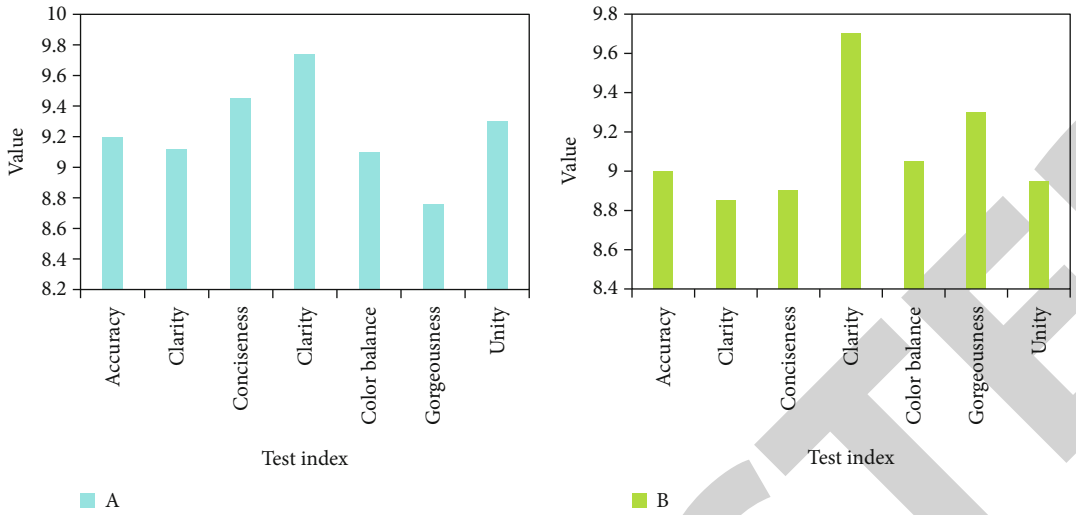

Figure 6: Evaluation data.

Table 5: Data statistics under 7 experimental conditions.

Text effect	Average	Standard deviation	Number
Top to bottom	6.80	1.400	40
From bottom to top	7.00	0.877	40
From left to right	7.10	0.841	40
From right to left	5.35	0.770	40
Middle to both sides	6.60	1.150	40
Line by line	7.13	1.067	40
Development	7.17	1.394	40

high luminosity, reflectance, refractive index, and many other attributes. Assigning textures to materials will make the details of the model more realistic and delicate, for example, old scratches and complex carvings. Mapping can reduce the workload of modeling to a large extent and can show the details that the model itself cannot show.

Before mapping, we must first split the UV. In earlier versions of Maya, UV splitting was very difficult. With software upgrades and continuous development, Maya has absorbed the production principles of some excellent UV splitting software and merged it into its own UV splitting system, which is the UV automatic smoothing tool. The use of this tool greatly eases the complexity of UV splitting. 3S materials must use a specific renderer. In Maya, you need to start the Mental Ray renderer to use this excellent material technology.

4.3.4. Maya Scene Lights. The reactions of objects in reality to light are divided into three categories: diffuse reflection, specular reflection, and refraction. In diffuse reflection, due to the uneven surface of the object, most of the light is absorbed by the object, and the other part is reflected into the eyeball in various directions, such as stones and sweaters. In mirror reflection, the surface of the object is very smooth, and most of the light is reflected by the object in a parallel manner and enters the eyeball, such as glass and chrome-plated metal. Refraction light penetrates the object, but the propagation path is affected by the object's medium and shifted, such as water and glass. The light that best simulates sunlight is parallel light. The most basic way to simulate outdoor environmental lighting in a project is the three-point light source method. The main light brightens the light and dark of the main scene; the auxiliary light supplements the area not covered by the main light; the supplement light is the final supplement. There can be no dark places in the scene, because all kinds of materials in the real environment have diffuse reflection, which can reflect light continuously until the light is exhausted.

4.3.5. Maya Scene Output. When preparing for rendering, at least one virtual camera must be set up in the working area of the software, and the perspective camera is generally selected because it follows the principle of a real camera and has a three-dimensional effect. The rendering program also chooses the stacking sequence of foreground, middle ground, and background. The effect is directly related to whether the three-dimensional expressiveness of the object gets the best full interpretation. This needs to be closely related to the attenuation of the light source, environmental fog, and depth of field effects. After the rendering program obtains the range, it starts to calculate the influence of the light source on the object. When calculating, the rendering program not only considers the main light source, but also a lot of auxiliary light sources. At the same time, it is also necessary to consider how the texture of the model is used, as well as light source, special effects, and so on. These are not considered separately, and the effects that each attribute can produce must be considered superimposed; so, the rendering process becomes essential.

4.4. Interactive Production of Animation Simulation Scenes

4.4.1. UI Layout. The visual experience of interactive animation is essential to the audience, which is a factor that directly affects its attention rate and cannot be ignored. At

the same time, color tone is also essential for interactive animation. Different color tone animation styles will be different, and animation will give people different feelings. At the same time, according to the needs of animation content, the symbolism of colors can be used to adopt different main colors. Finally, in the design of the background color of the animation, it is necessary to pay attention to the emotion of the color to conform to the nature of the animation. For example, an animation about environmental protection, if dark red is used as the main background tone of the animation, it is difficult to remind people of the content of the animation. It is related to environmental protection. In addition, consider the background color of the animation, that is, the brightness of the background color. Usually, the background color is inversely proportional to the main content and the color brightness of the main form. In short, the color of the animation is viewed from the perspective of the audience, the color matching is better, and it must have its own style. Whether in cartoons or games, you will see some characters created by designers that do not exist in real life, but you can see the epitome of certain material elements in real life from these characters. It can be said that the animated character is to extract, decompose, combine, and recreate the material elements of real life and use some existing elements as the main symbol, according to exaggerated abstraction, anthropomorphic, simulant and other methods, and change his combination. The unique role formed by the way and ontological attributes and ontological characteristics.

4.4.2. Scene Animation Camera. The animation scene will change with the passage of time following the development of the story. Therefore, in the lighting design, the animation changes of light intensity and color temperature should be produced. When making animation settings, turn on the animation record button. The change of the scene from day to night is achieved through the alternation of sunlight and sky illuminance parameters. First, record the position of "VRAY Sunshine" as the track change of sunset and record the change of sunlight parameter from high to low at the same time. Then, record the change of the illuminance parameter of the skylight from low to high.

4.4.3. Create Walking Camera and Character Path Animation. For the characters in interactive animation, it is a perfect unity of artistry and creativity. It is to maximize the creative thinking of the designer and use this creativity and novelty to satisfy people's visual enjoyment. The character in this interactive animation is designed by the author of this article to analyze the real objects in life, to refine their characteristics, and use artistic techniques to form visual element symbols, and then put this symbol into the conceptual language of history, society, humanities, and ecological environments. The interactive animation character design process is shown in Figure 7. The setting and creation of an animated character are not about the designer closing his eyes and thinking hard, the image suddenly emerges on the paper, and it is an orderly and purposeful integration and extraction of various elements, such as the elements of times, regions, and nationalities that are formed by a solid theoretical foundation and the genetic transformation of unique artistic logical thinking.

4.4.4. Distance to Departure and Time Display. The path planning chain consists of a head node and several planning nodes. The head node is the starting point of path planning, and the other nodes are path planning data nodes. When creating a path planning chain, first, a new node is planned by the new operator as the head node of the path planning chain. Secondly, establish the data node of the path planning chain; that is, select the shape, give the normal vector, input the movement/rotation value, calculate the start position coordinates and end position coordinates of the shape, and add the data node to the tail of the path planning chain. Taking the time detector node as the driving force of the animation behavior, taking the position key points and the corresponding key values defined in the position interpolator node as the data input, the smooth animation trajectory is calculated and obtained by using the interpolation calculation method. Finally, a route is added between the time detector node and the position interpolator node, and a route is added between the position interpolator node and the model, to realize the animation of the 3D scene. The delay comparison between server push and active request is shown in Figure 8. As it can be seen from the figure, when the network quality is the same and the number of nodes is the same, the time delay generated by server push is much less than that generated by the active request. From the design level, the design cost and complexity of server push are much less than that of RTI software based on advanced architecture.

4.4.5. Creation of Weather Information and Navigation Map. To reflect the authenticity of the scene and conform to the realistic style positioning of the animation scene, the background used generally adopts real photos, and then the necessary artistic processing is performed on the photos to keep the colors and model styles of the photos consistent with the scene. Import the sky photos taken by painter software to draw the clouds in the sky. Save the drawn sky picture, then open it in photoshop, and adjust the color of the sky background through photoshop's color adjustment. Use photoshop's feathering function to copy and stitch photos into a seamless 360-degree picture. The experimental results of the improved inner bounding box technology in different scenarios are shown in Figure 9. It can be seen that the more complex the structure of the scene, the larger the number of triangular faces and the smaller the faces, and the improved algorithm can greatly reduce the number of invalid intersections between the light and the inner faces of the bounding box. At this time, the advantage of the improved algorithm is more obvious.

4.4.6. Unity Android, PC, and Web Development Environment Configuration and Release. The hardware requirements of Maya 32-bit version are as follows: if it is a win series (generally Windows2000 and WindowsXP) operating system, it needs Pentium 4 processor or higher speed, or a 64 bit AMD processor. Of course, the current

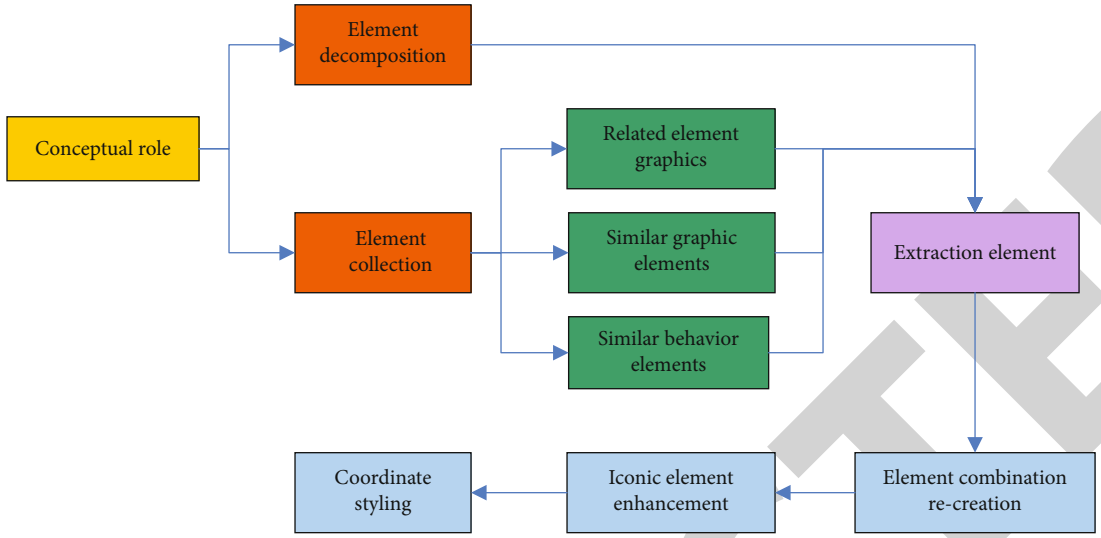

Figure 7: Interactive animation character design process.

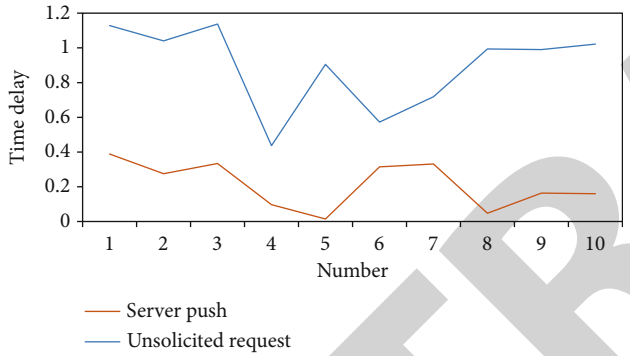

Figure 8: Delay comparison between server push and active request.

dual core or even quad core is certainly no problem. Memory generally requires more than 2G. Maya also needs 2G of additional space when enough running space is reserved for the system.

From the beginning of human body and scene modeling, it was completed in May. Modeling technology relies on a variety of combinations of its commands and finally forms a variety of models. The model is exported, UV is divided in the plug-in, and the texture can be drawn in photoshop after the UV is made. The Maya software itself is very powerful and supports the import and export of multiple formats, such as 0bj, and Max, which can form a better interaction with other software. When making key frames for actions, any format can be exported for key frames. When the key frame animation is completed, there can be a screen capture function for previewing the animation. Screen shooting is different from rendering. Rendering is a high-quality output, while screen capture is a simple screen capture of what you see in the operating area in Maya. The final evaluation result is shown in Figure 10. Under the same viewing conditions, the subjective evaluation of the video after the previous design of the interactive optimization elements of the mechanical motion 3D simulation visual interface is carried out. The vast majority of people think that the video is clear and real, with a three-dimensional sense of space, smooth movement of objects, and comfortable use of the lens.

5. Case Analysis and Development Trend of the Combination of Visual Sensors and Animation Simulation Interactive Products

5.1. Case Analysis of the Combination of Visual Sensors and Animation Simulation Products. This design adopts the horizontal expansion and splicing of two display screens to form a large screen visual simulation demonstration system integrating virtual visual display and synthetic visual simulation. The resolution of a single screen is 1440×900, and the resolution of the spliced screen is 2880×900. The left tenth of the screen displays the left view, right view, and rear view of the aircraft flight scene from top to bottom to observe the flight status of the aircraft. The remaining part of the left screen displays the aircraft window screen, and the HUD screen is displayed in the middle in the way of the picture-in-picture superposition. The upper part of the right display displays the sensor imaging picture and PFD picture, and the lower part displays the vertical position profile, radar picture, and two-dimensional map navigation. The scene software provides a 32-bit data mask system for processing. The mask includes culling mask, rendering mask, and collision mask. The purpose of distinguishing different objects is achieved by setting the mask value. Only when the bitwise and operation of the two masks are not 0 can they interact with each other. The digital terrain mode needs to be displayed on the PFD picture channel, while the real terrain needs to be displayed on the window picture and other channels. Therefore, it is necessary to set the mask corresponding to the feature model and channel to control the display of the feature model in the channel.

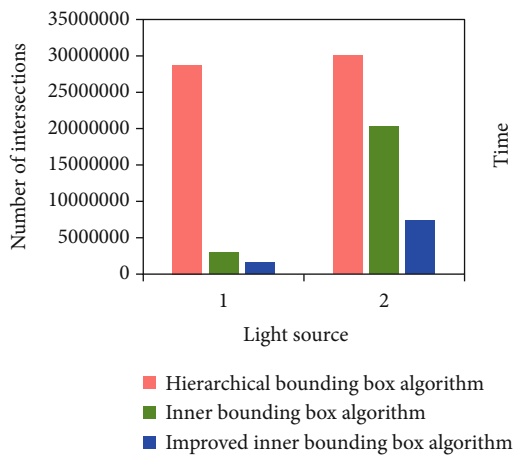

Figure 9: Experimental results of improved inner bounding box technology in different scenarios.

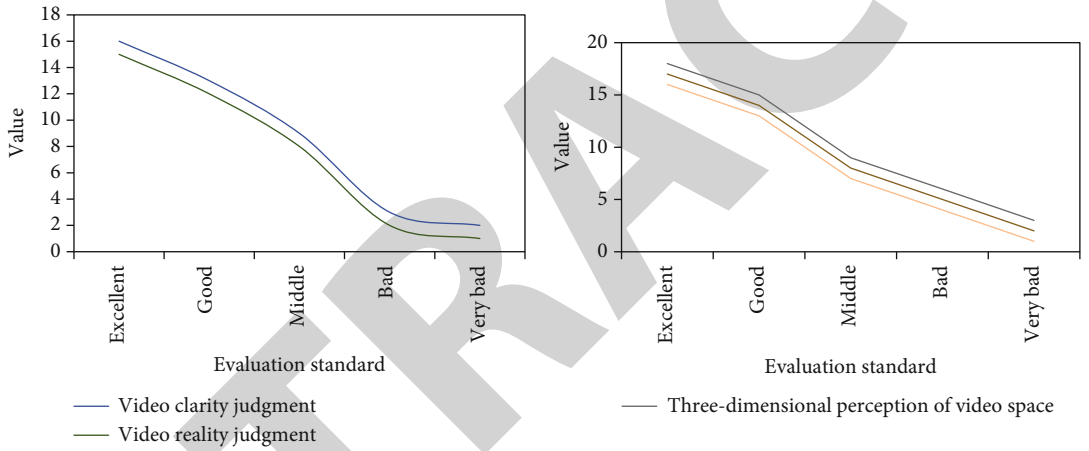

Figure 10: Final evaluation result.

5.2. Development Trend of Interactive Products under Animation Simulation Technology. In this paper, the whole animation is composed of several plot segments. The connection point between the animation segments is called the plot node. The audience can participate in the animation interaction and choose the direction of the animation plot when the animation plays on the plot node. The interactive animation information interaction form adopts the interactive button. After the audience clicks the button, the action script points to the SWF file where different plot segments are located according to the action script of the button to load the subsequent plot animation.

Considering that the network plays a positive role in the development and dissemination of interactive animation, this paper fully considers the need to embed in the web page, divides the animation plot, and makes the size of each SWF file conducive to web page loading. The audience can arrange the plot trend by themselves through the web page. Combined with database technology, the plot arrangement records can be stored in the database, so that the subsequent plot path pointed by the interactive button script can be dynamically loaded according to the database records, to enable the audience to participate in the animation production and increase the audience's participation and animation interaction. The database data can also be used for voting statistics. According to the time sequence of story development, the whole story plot is vertically divided into several levels. Each level contains one or more plot nodes. When the creator conceives and creates the animation, he defines the plot development direction of each layer and the content of each layer. The specific plot nodes need to be created according to the definition framework of each layer of plot, and the plot nodes at each level can be connected with the plot nodes at the next level. In this way, the interactive design and implementation in animation design can provide broader participation dimensions and space for animation creators and participants than a tree structure.

6. Conclusions

As a special emerging form of cultural industry, cultural creative industry is the high-end and frontier of the

development of modern cultural industry. This paper studies the system structure, synthesis mode, and presentation processing mode of the multisource information synthesis scene system. This paper deeply studies and analyzes the synthesis mode, symbol processing, display, indication mode, and other details of the synthetic scene, studies the synthesis and enhanced scene technology of the visual environment simulation, and applies it to the independent design of the synthetic scene display system. This paper starts from the audience control mode, information transmission mode, interactive guidance, and interactive tool design. The interactive design of interactive animation is studied and expounded from these four aspects. The audience control mode should be considered from the perspective of audience participation, highlight the guidance to the audience, and combine the diversity of information transmission; vision is the most direct way to convey interactive animation information. In the visual communication design of interactive animation, the design of animation metaphors can give play to the idea of initiative and symbolize a certain idea through some graphics, which is generally not available in traditional animation.

Data Availability

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

Conflicts of Interest

The author declares that he has no conflicts of interest.

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