

## *Retraction*

# **Retracted: Research on 3D Jewelry Design Based on Virtual Reality Technology**

### **Wireless Communications and Mobile Computing**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) 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] H. Chu, "Research on 3D Jewelry Design Based on Virtual Reality Technology," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 3119037, 8 pages, 2022.

## Research Article

# Research on 3D Jewelry Design Based on Virtual Reality Technology

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The existing three-dimensional jewelry design method has the problem of imperfect three-dimensional display model, which leads to a high product wastage rate. A three-dimensional jewelry design method based on virtual reality technology is designed. From the perspective of diversified production needs, the jewelry production and processing process is obtained. CNC plate making is adopted to identify the technological characteristics of plane elements. The digital three-dimensional model is taken as the design carrier, and the three-dimensional display model is constructed by virtual reality technology. *Experimental Results.* The average product loss rate of the three-dimensional jewelry design method in this paper and the other two three-dimensional jewelry design methods were 5.523%, 8.043%, and 8.237%, respectively, indicating that the performance of three-dimensional jewelry design method is more perfect after the combination of virtual reality technology.

## 1. Introduction

Jewelry design is the product of the development of human civilization at a certain stage, and it is a practical activity for artificial beauty ornaments [1, 2]. From the early paleolithic age, people used leaves and bird feathers as clothing, which had the primary aesthetic thought and practical basis of jewelry design. Its history dates back to the Renaissance period from the 14th to 16th centuries. In the second half of the 19th century, large-scale industrial production separated design from production, and the first designers came into being. The first jewelry design drawing drawn by designers in a real sense was achieved when designers expressed their design ideas in drawings. In the face of the social changes brought by the information age, modern design also has a new position. The information age requires that jewelry design products should achieve the optimal comprehensive benefits such as quality, performance, time, cost, and price, so as to meet the market demand. There are different opinions and assumptions about the beginning of primitive jewelry in different literatures. The functional theory holds that jewelry originated from the principle of carrying around production tools on the basis of practicality.

Survival theory holds that jewelry originates from the shelter of totem culture. Beautification theory believes that jewelry originated from the awakening of human aesthetic consciousness and body decoration. The game theory holds that jewelry originated as a prop used in pleasurable games. The theory of alienation holds that jewelry originates from the belief and worship of primitive animals. Later, in the slave society, handicraft became handicraft industry independently. In the age when there was no communication media such as paper and pen, craftsmen simply depicted their design ideas on walls or land, which was the earliest “design drawings.” Later, the invention of paper greatly promoted the development of writing and painting. Gradually, some artisans began to express their original design ideas through painting, which was the earliest jewelry design drawing. According to the data, jewelry design was initially served by handicraftsmen for aristocrats, and the form of jewelry custom design is in the true sense of today’s posture. However, in a word, jewelry originated from primitive society. At the beginning of its appearance, there was not much design at all, and the wearing of primitive jewelry was just a random event with a simple motive. At the same time, the jewelry design theme is mainly computer-aided jewelry

design, relying on knowledge and using a variety of scientific methods and technologies to improve and innovate in the jewelry design and creation process [3]. In today's society, jewelry is no longer just a symbol of wealth or a simple decorative object. Now, more and more people choose to wear jewelry of different art forms to express their personality and taste. Jewelry has begun to become a wearable, rich, and touching artwork. At the same time, with the deepening of the application of computer technology in design, jewelry design is becoming more and more personalized, humanized, and more integrated. At present, the academic circles are not very rich in information about the combination of virtual reality technology and jewelry design, which needs to be further discussed.

In other words, human-centered, interactive-centered technological assistance is being created as physical rendering moves toward data networks, forms, and virtual reality (VR). Modern displays are evolving, and one of them is the virtual display, which is also a potent representation of the mindset and innovation of the time. The virtual display simulates actual scenes using computers, allowing viewers to be stimulated on the visual-based sensory system through natural human-computer interaction techniques that fit their own cognitive and behavioral habits, produce a fun interactive experience, and accept display information communicated by display design [4–7].

## 2. Research on 3D Jewelry Design Based on Virtual Reality Technology

*2.1. Obtaining Jewelry Production Process.* Jewelry design is a broad category, which includes various jewelry shapes in line with modern art, modern processing industry, modern commerce, and social environment. It is the product of the combination of modern material civilization, art, and science [8, 9]. Modern jewelry design should not only face the market but also face customers, which requires our jewelry design ideas to realize the basic functions of products, but also pay attention to reflecting humanization and environmental friendliness. Under the influence of modern design, jewelry design has undergone continuous innovation of raw materials, production technology, art forms, and design concepts, and jewelry forms are no longer limited to the past fine and soft. Artistic jewelry, concept jewelry, and other jewelry forms emerge in an endless fashion, and people's understanding of jewelry gradually shifts from focusing only on the value of material to the artistic value of jewelry [10, 11]. Jewelry design mainly includes three core contents, as shown in Figure 1.

As can be seen from Figure 1, design conception is a decisive factor affecting jewelry design. The design concept permeates the social and cultural background of modern civilization, market, and economic factors. Visual communication is a necessary means to convey and express the idea, shape, material, and craft of jewelry design in a clear and definite way. The rapid development of the modern computer industry has made visual communication more and more clear, fast, and accurate. The development and application of two-dimensional and three-dimensional software has greatly

improved the efficiency of jewelry designers to some extent. Jewelry production and processing process is generally divided into the following steps, as shown in Figure 2.

As can be seen from Figure 2, hand-drawn design drawings (including custom design), template making, sample production, marketing, mass production, and other links in the process are interlinked and progressive and cannot be fault, leap forward, or reciprocal. In hand carving wax version of the traditional way, the skin texture to make similar bark, we need to constantly grind, file drops of wax, wax, etc., and because of the limitation of the error of manual and tools, we can achieve fine, natural texture effect, and carving wax by hand takes the human cost and time cost is too high, and the wax models of fault tolerance rate are very low. If new ideas or ideas are incorporated into the design process, the wax model being made will have to be pushed back to the beginning. Such a production mode is bound to lead to the simplification of the production process, such as production link problems will inevitably affect the entire production chain. At the same time, the unitary production process is not conducive to the production demand of enterprises and is not conducive to the promotion and circulation of new products through multiple channels. From the perspective of diversified production demands, traditional NURBS or polygon modeling cannot produce texture effects similar to bark, so we use the model as a low mold, just like the ring wax in the jewelry industry. With this low mold, we realize our final design goal through ZBrush. Based on this, complete the steps of obtaining jewelry production and processing flow.

*2.2. Identifying the Process Characteristics of Plane Elements.* Different from flat point elements, point elements can vary in volume, size, shape, and thickness in jewelry design. As the basic element in jewelry design, point elements are the smallest design element in jewelry modeling. High precision rapid plate making is reflected in high precision and fast, of which high precision includes two categories. One is to realize high precision plate making. Jewelry processing and production, due to the value of its materials, must have low loss in the process of processing. Different changes in the number, size, density, and arrangement of elements can make jewelry present different visual effects. Here to explain that some of the elements in the jewelry design, three-dimensional forms are flexible but are not limited to the conventional concept of round. For example, it can be an ornament on the jewelry round or members of the opposite sex gem, can also be a metal of abstract or representational form, and also with the texture of the material itself, can also view a whole jewelry shape as a point. If the surface accuracy of jewelry casting is not enough, that is, the surface accuracy of jewelry processing is generally not less than 0.02 mm, then the subsequent processing process is bound to cause excessive loss and increase the production cost. Single point is stationary, concentrated, such as the abstract meaning, can give a person the sense of concise, independent, in jewelry design, can see a single gem as a point, can also be in the form of various independent elements as a point, for example, elegance, wanxian, can highlight the wearer's quiet, and comely

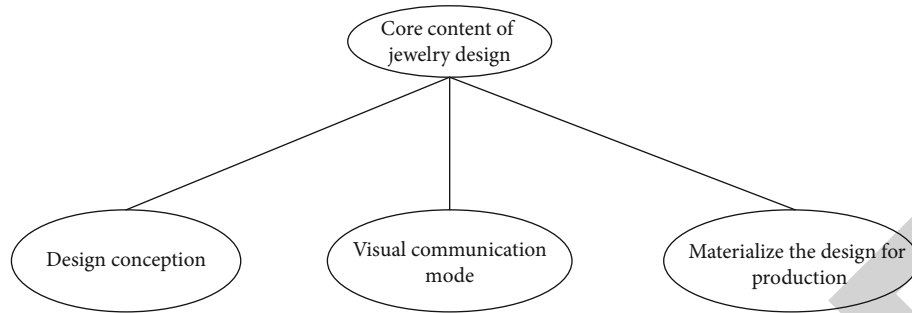


FIGURE 1: Core content of jewelry design.

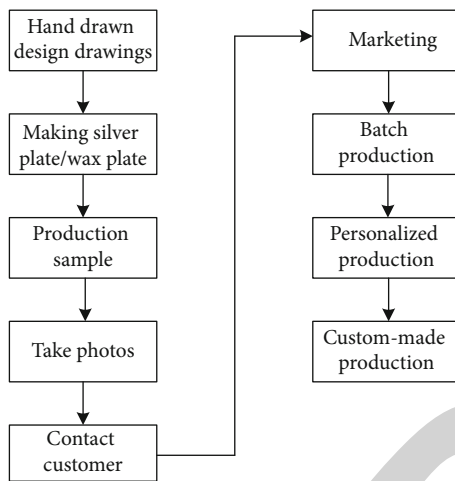


FIGURE 2: Jewelry production and processing process.

temperament. Jewelry designed by simple geometric elements such as single triangle, square, and circle gives people a sense of individuality, cold, and industrial style [12, 13]. The precision of the template produced by the rapid prototyping equipment of stacking molding and curing molding (mainly wax plate made of wax material and resin plate made of resin material) can reach 0.01 mm, fully meeting the needs of production. If the use of CNC plate can be directly carved and milled into precious metal version, which can also save the processing links of casting, more can reduce the loss. In jewelry design, there is not only a single point of expression, but more through the combination of multiple points to present the different beauty of jewelry. The arrangement and combination of multiple points in jewelry design can be divided into two kinds: orderly and disorderly. The disorder of the point is mostly presented in the form of scatter, which can also be freely scattered in any position of the jewelry shape. There are mainly five orderly combination modes, as shown in Figure 3.

As can be seen from Figure 3, it can be divided into five combination forms: linear, grid, specific contour, center gathering, and center diffusion. Linear arrangement is a common jewelry design technique, multiple points in a straight line arrangement give a person a kind of coherence, and the gradient, the regularity, and development experience, with some form of ring jewelry, regularity of elegance to the move, have static, unified independent sense; if the point to curve

shape is arranged on a regular basis, you can display a surge of way, rhythm, and potential of active feeling. Another category is to achieve high precision style modeling design, the thinnest part is 0.3 mm, and using traditional processing technology is difficult to produce, if the use of rapid prototyping technology can completely achieve the design and production of the style. The grid arrangement means that point elements are arranged evenly longitudinally and horizontally in an orderly way through warp and weft and finally combined into an organic whole. Similarly, the density and size of the midpoint elements of the grid will also make the jewelry present different effects. For example, a tight grid gives people a sense of stability, seriousness, and order. If the points are formed into a dense piece with different sizes, it will give people a sense of freedom, fluffy, diffuse, and open. Cluster-like combination of multiple points to a location as the center of the central gathering, or make points based on a contour gathering combination. For example, in jewelry design, a diamond set in white gold support gives a person a kind of pure to simple, independent, cool beauty. A ruby is placed around the center to match the broken diamond as a rule to give a person a gorgeous feeling, more prominent the existence of the central gem sense. At the same time, you can also use broken drill to do group inlay. The shape can be flexible, distorted and undulating, or circular around, but also abstract, like, or natural shape. The shape changes in multiple, with great freedom, giving people a richer, colorful, gorgeous feeling. Based on the above description, complete the steps to identify the process characteristics of plane elements.

**2.3. Virtual Reality Technology to Build Three-Dimensional Display Model.** Virtual reality technology is a comprehensive technology, involving computer graphics, artificial intelligence, simulation technology, human-computer interaction technology, network parallel processing, and sensing technology [7, 14, 15]. According to the physiological and psychological characteristics of human vision and hearing, virtual reality technology uses 3D graphics generation technology, multisensor interaction technology, and high-resolution display technology to jointly simulate and generate 3D realistic virtual environment. In this environment, users can like in the real environment, experience, if can look, touch, listen, and even be able to operate the various devices, for example, a user can directly with one hand grab objects in a virtual environment, the feeling of hand is grasping things

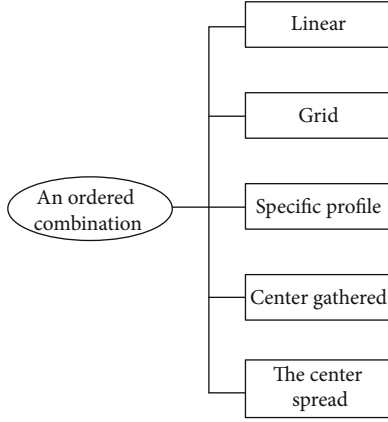


FIGURE 3: Orderly combination of jewelry design elements.

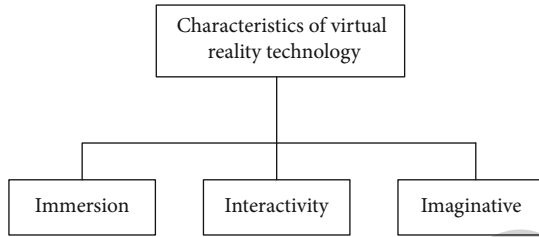


FIGURE 4: Characteristics of virtual reality technology.

TABLE 1: Production quantity 200 product loss rate (%).

Number of experiments	3D design method of jewelry based on 3D printing technology	3D design method of jewelry based on depth camera	The 3D design method of jewelry in this paper
1	2.215	3.123	0.948
2	2.156	3.060	1.112
3	2.148	2.584	0.847
4	2.699	2.714	1.306
5	2.315	2.306	1.225
6	3.005	3.021	0.647

TABLE 2: Production quantity 500 product loss rate (%).

Number of experiments	3D design method of jewelry based on 3D printing technology	3D design method of jewelry based on depth camera	The 3D design method of jewelry in this paper
1	5.612	5.719	4.121
2	6.021	6.285	4.306
3	5.649	7.006	4.502
4	6.313	6.554	4.292
5	5.847	6.319	4.316
6	6.138	7.025	4.228

TABLE 3: Production quantity 1000 product loss rate (%).

Number of experiments	3D design method of jewelry based on 3D printing technology	3D design method of jewelry based on depth camera	The 3D design method of jewelry in this paper
1	9.458	10.548	7.485
2	10.202	9.663	7.125
3	9.886	11.502	6.847
4	10.231	10.367	7.223
5	9.687	9.648	6.796
6	10.455	10.336	6.588

at this moment, the user can feel the weight of the object, and the object can move as the hand movement. This creates a feeling of being on the scene. As can be seen from the above description, the main features of virtual reality technology are as Figure 4.

As can be seen from Figure 4, the main characteristics of virtual reality technology include immersion, interaction, and imagination [16, 17]. The first step is to determine the design prototype. Parametric design thinking, based on non-linear thinking and complexity science, guides people to understand the complexity of nature and understand the essential characteristics and laws of the development and change of things by using this world view. Therefore, before the design, the designer needs to select a design starting point through the observation of nature and life, take this as a blueprint, through rational analysis, summarize the development, and change law of the design prototype or modeling law. If there is a central projection from a point in space to a plane, let the point be the origin of coordinates. Based on the similar triangle principle, it can be expressed as a linear mapping between homogeneous coordinates, and the expression formula is as follows:

$$W = \frac{1}{g} \text{dia}(g-1)^2. \quad (1)$$

In formula (1),  $g$  represents the three-dimensional space coordinate point, and  $\text{dia}$  represents the homogeneous coordinate form. The above assumption is that the coordinate origin of the image plane is on the main point. In fact, there is always a certain offset between the origin of the image and the main point. However, this assumption is difficult to realize in reality, so the mapping of Equation (1) should be improved as follows:

$$W' = \left( \frac{l}{R_g} \right)^2 + \delta \frac{g}{R^2}. \quad (2)$$

In formula (2),  $l$  represents the offset interval,  $R$  represents the linear mapping value,  $\delta$  represents the dimension of data information, and  $g$  has the same meaning as formula

TABLE 4: Production quantity 200 0product loss rate (%).

Number of experiments	3D design method of jewelry based on 3D printing technology	3D design method of jewelry based on depth camera	The 3D design method of jewelry in this paper
1	14.304	12.063	9.154
2	13.645	13.964	10.023
3	13.887	12.065	9.684
4	14.669	13.228	10.235
5	13.021	14.063	9.887
6	13.457	14.526	9.648

(1). Then, the pose expression formula in the camera coordinate system is as follows:

$$H = \delta [U \tilde{D}]^K. \quad (3)$$

In formula (3),  $\delta$  has the same meaning as formula (2),  $U$  represents scale factor,  $\tilde{D}$  represents distortion parameter, and  $K$  represents rotation matrix. In jewelry virtual design, the digital and interactive three-dimensional model is used as the carrier of design ideas, which can convey the designer's ideas and works in a way that ordinary people can understand and fully express the intention of jewelry designers. The application of virtual reality technology makes jewelry design more intuitive, so that customers, sellers, and processing personnel can intuitively understand jewelry design schemes through 3D virtual models designed by designers [18–20]. Thus, the customer's ability to read professional design drawings is greatly reduced, and opinions from all aspects can be exchanged smoothly in the design process so as to quickly produce a consensus on the scheme. The second step is to determine the basic logic, parameter programming to generate initial graphics. The third step is to optimize the basic graphics logic and select the required graphics for modeling. In general, the basic graphics logic cannot be used directly but needs to be modified tentatively by adjusting parameters and constraint relations. Through several deformation attempts, the optimal scheme is selected for entity modeling. The processing and making of jewelry is the process of materializing jewelry. Traditional jewelry design and making, without the concept of design and the process of design, can be said to be inseparable from design and making, directly forming the prototype of the design in the mind of the artisan. Then, with skilled craft skills, jewelry materials such as metals and gems are used to make jewelry. In addition, jewelry design using virtual reality technology can not only modify and evaluate the design scheme at any time but also provide accurate data of virtual model, which can also be processed or molded into CNC molding machines such as engraving machine, wax spraying machine, and resin machine [16, 21]. In this way, after the design is completed, the wax model can be made and immediately put into production. The "design" of jewelry only appears in the mind of the craftsman, while the

production becomes the whole process of the formation of jewelry. Based on this, the steps of constructing three-dimensional display model are completed.

*2.4. 3D Point Cloud Stitching Algorithm to Optimize 3D Design Mode.* 3D point cloud technology shows more and more irreplaceable advantages and has begun to serve people's life. However, most of the time, it is only in a specific field, lacks the cross-application of other disciplines, and fully excavates its potential application value. The principle is to use affine invariance to extract congruent four points in two-dimensional plane; similarly, affine invariance can be used to extract nearly congruent four points in three-dimensional space. In order to ensure that the extracted feature points can better represent the geometric information of the point cloud surface, feature points are extracted under different radii. At the same time, the probability of noise points being feature points under multiple neighborhood radii is relatively small. Therefore, the intersection of feature point sets extracted from different radii is selected as the final feature point set in this paper, which can suppress noise interference and obtain more robust feature points. However, too many neighborhood scales will consume a large amount of calculation time. Therefore, two neighborhood radii are selected for discussion in this paper. Then, their intersection is selected as the final set of feature points. When the neighborhood radius is less than 1, the expression formula is as follows:

$$E = \bigcup_{q=1}^p \left( \frac{G}{\sum_{p+1}} \right). \quad (4)$$

In formula (4),  $p$  represents the feature point under one neighborhood radius,  $q$  represents the feature point under multiple neighborhood radii, and  $G$  represents the set of feature points. When the domain radius is greater than or equal to 1, the expression formula is as follows:

$$E' = \bigcup_{q=1}^p \left( \frac{z}{\sum_{q+1}} \right). \quad (5)$$

In formula (5),  $z$  represents the final feature point of the intersection of feature points, and the other variables have the same meanings as formula (1). According to formulas (4) and (5), the weighted mean curvature of all the neighboring points in the neighborhood with different radii can be obtained, and the calculation formula is as follows:

$$d_{\text{avg}} = \frac{\|T_{pq} - T_p\| \times \eta}{\|T_{pq} - T_q\|}. \quad (6)$$

In formula (6),  $T$  represents the number of nearest neighbor points,  $\eta$  represents the weight function of monotonically decreasing, and  $p, q$  has the same meaning as formula (4). Each object is a self-contained entity with properties such as color, shape, outline, size, and screen position. Since each object is designed as a self-contained

three-dimensional entity, its properties can be moved and changed many times without affecting the other objects in the legend, while maintaining its original clarity and curvature. Once the drawing is adopted by the customer, wax mold will be carved, and then, after careful inspection, no problem will be lost wax casting. After the designer completes the sketch, the model can be modeled in the computer-aided software. Drag the mouse to operate the target object to carry out translation, zoom in, zoom out, and copy. These characteristics make vector-based programs particularly suitable for legends and 3D modeling, since they typically require the ability to create and manipulate a single object. Vector-based drawings are resolution-independent, meaning they can be displayed on output devices at the highest resolution. In the field of jewelry design, when virtual reality technology is used as a single technology, it is mainly applied to change the style on the basis of existing high-precision photos, beautify pictures, and finally synthesize effect pictures with different backgrounds. The jewelry model can be observed from all angles, and the software itself can check the three-dimensional relationship between the point, line, and plane of the target object to ensure that the finished product processed meets the requirements. At this point, the ratio method of nearest neighbor and second neighbor is used to screen the corresponding relationship between points, lines, and planes, and the calculation formula is as follows:

$$\mu = \frac{s}{\varphi} (1 - \gamma)^T. \quad (7)$$

In formula (7),  $\varphi$  represents the curvature at the nearest neighbor point,  $s$  represents the corresponding point in the feature point set, and  $\gamma$  represents the setting threshold. The method of double constraint is adopted, that is, the included angle between points is used to determine on the basis of the above, and the expression formula is as follows:

$$\gamma = \frac{\nu}{|h_i| \times |h_j|}. \quad (8)$$

In formula (8),  $\nu$  represents the neighborhood radius,  $h$  represents the included normal angle less than  $45^\circ$ , and  $i, j$  represents the distance from each point to the neighborhood center. Although a lot of time was spent on this design, it took maybe two or three weeks to complete the wax mold. The combination of virtual reality technology broadens the design tools of designers [22]. From paper and pen to computer-aided design can be auxiliary drawing software can also be the designer's own design procedures, which can change the abstract parameters can directly change the output of the design product. The main method is to take high-precision photos of jewelry of different styles, such as gems, inlaid claws, rings, chains, and ring buckles, as materials and save them in layers. Finally, the design of jewelry is realized through the combination of different layers. The background can also be added appropriately to directly realize the poster design of jewelry. The emergence of new technology not only enriched the designer's design tools but also

assisted mass production. First, make the metal mold and then pour out the rubber mold. Hand up version process complex part is plastic mold shrinkage rate, and the damage rate does not guarantee that each wax model specification is the same, and cast into metal jewelry and postprocessing can wear, especially with the aid of caliper measuring the thickness of the workpiece; with the manual operation, hard to avoid has the error, and even very experienced teacher cannot be as accurate as the machine. It requires a lot of professional knowledge such as hammer, welding metal, grinding and polishing, electroplating, sandblasting, and forging metal. Based on the above description, the steps of optimizing 3D design mode are completed.

### 3. Application Testing

**3.1. Test Preparation.** In this test, Cult3D technology can be used to design interactive functions of jewelry models designed in 3D Max. Cult3D is a new Web 3D technology developed by Cycore; as a desktop virtual reality platform, its main purpose is to build interactive 3D model on the Web page. The advantage of Cult3D is very small file size (20 K-200 K), for network applications, There are nearly perfect three-dimensional texture performance and functional appearance display. In the process of detail making, Alpha graphics are also used to make richer changes. After the model is optimized, Dynamesh and ZRemesher functions are used to quickly topologize low models (more faces are reserved according to the level of detail of the model). Import it into Max to split UV, import it into Toolbag baking normal, and finally finish material making in Substance Painter. Cult3D has relatively low hardware requirements, making it easy for users to navigate Cult3D even on a low-spec desktop or laptop. In addition, because the kernel of Cult3D is based on JAVA language, it has strong interactive and extensible performance and supports 3D file format. After designing interactive functions, the model can be seamlessly embedded into online HTML pages and other applications. Import the low mold made by Max into ZBrush in Obj format, add subdivision level, set parameters of Lazy Mouse brush, and use Slash brush and Stamp brush to depict texture. The characteristics of the software are in line with the software and hardware environment of the subject as well as the target of application. It can be used to complete the interactive action design of 3D jewelry model through relatively intuitive and simple operation. The designed 3D virtual model of jewelry is imported into the Cult3D software, and interactive action nodes and original elements are added to it. Then, the behavioral attributes of each node and the logical relationship between each node are set to realize the basic interactive function of virtual display.

**3.2. Test Result.** In order to verify the practical application effect of the 3D jewelry design method in this paper, its application test was carried out. The jewelry 3D design method based on 3D printing technology, the jewelry 3D design method based on depth camera, and the jewelry 3D design method in this paper are selected for application test.

Test the product loss rate of the three jewelry 3D design methods under different production quantities. The lower the loss rate, the better the performance of the method is proved. The experimental results are as Tables 1–4.

It can be seen from Table 1 that the average product loss rates of the 3D jewelry design method in this paper and the other two 3D jewelry design methods are 1.014%, 2.423%, and 2.801%, respectively.

It can be seen from Table 2 that the average product loss rates of the 3D design method in this paper and the other two 3D jewelry design methods are 4.294%, 5.930%, and 6.485%, respectively.

It can be seen from Table 3 that the average product loss rates of the 3D jewelry design method in this paper and the other two 3D jewelry design methods are 7.011%, 9.987%, and 10.344%, respectively.

It can be seen from Table 4 that the average product loss rates of the 3D jewelry design method in this paper and the other two 3D jewelry design methods are 9.772%, 13.831%, and 13.318%, respectively.

#### 4. Conclusion

Based on the research on the development characteristics of jewelry design, this paper puts forward a new viewpoint of applying virtual reality technology to jewelry design. Combined with the types and characteristics of virtual reality technology, this paper deeply discusses the advantages and significance of the application of virtual reality technology in jewelry design and effectively verifies the feasibility of this subject in the form of example application. Due to the limited ability, there is still much room for improvement in the accuracy of the method.

#### Data Availability

The data used to support the findings of this study are included within the article.

#### Conflicts of Interest

The authors declare that they have no conflicts of interest.

#### Acknowledgments

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