Research on Humanization of Life Ceramics Design Based on VR Technology

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Abstract. the Development of Design Has Been Accompanied by the Progress of Human Civilization and Culture. the Progress of Contemporary Society is Gradually Changing All Aspects of Human Production and Life. Living Ceramics is One of the Types of Ceramic Products, with Certain Practicality and Appreciation. It is a Relatively Traditional and Ancient Ceramic Product in Our Country. Life Ceramic Design Serves People, and Humanization Must Become the Core of All Designs. in the Contemporary Era, the Research on the Concept of Humanized Design Has Gone Deep into Many Fields and is Quite Mature. in Ceramic Modeling Design, the Attention of Humanized Design is Particularly Important. Virtual Reality (Vr) Technology Can Be Used as a Tool to Test the Performance of Ceramic Products, Which Can Be Evaluated and Corrected in All Aspects Before They Are Put into Production, So That Designers and Customers Can Feel and Identify the Advantages and Disadvantages of the Products through the Virtual Model on the Computer. in This Paper, Virtual Reality Technology is Applied in the Research of Life Ceramic Design, and the Application of Humanized Design in Life Ceramic Product Design is Analyzed.

1. INTRODUCTION
China is a Large Ceramic Country with a Long History and Profound Cultural Background. Ceramic Culture Can Be Traced Back to the Ancient Neolithic Age and Originated from People's Creation Activities for the Convenience of Production and Life. Living Ceramics is One of the Types of Ceramic Products, with Certain Practicality and Appreciation. It is a Relatively Traditional and Ancient Ceramic Product in Our Country. Different Times Have Different Aesthetic Consciousness, and the Form of Beauty is Constantly Changing with the Times [1]. Life Ceramic Design Serves People, and Humanization Must Become the Core of All Designs. Art Living is the Development Trend of Our Times. Now the Interior Decoration Industry is Very Popular. People All Want to Create a Warm and Comfortable Living Space with Personalized and Unique Living Space [2]. Humanized Design Can Not Only Realize the Mutual Combination of Aesthetic Concepts and Use Functions, But Also Comprehensively Reflect Human National Tradition, Religious Culture, Living Environment, Moral Norms and Humanistic Spirit [3]. Although the Times Are Constantly Evolving, the Human Nature of Ceramic Art Has Always Existed and Must Be Preserved. It is a Natural Phenomenon That the Life Ceramic Art Design is Involved in Home Decoration and Decoration. It is Always the Unremitting Pursuit of Humans to Beautify Life and Improve the Quality of Life.

The Humanized Design of Living Ceramics Should Include Both Material and Spiritual Aspects. Its Design Purpose Has Already Gone Beyond the Narrow Scope of Pure Use of Functions, But is Based on People, and Strives to Make People Feel Comfortable and Happy Both Physically and Psychologically. [4 ]. with the Rapid Development of Modern Science and Technology, Digital Technology Has Increasingly Penetrated into Every Aspect of Daily Life, and Modern Design Methods
Have Also Undergone Major Changes [5]. Virtual Reality Technology is a Computer Advanced Human-Machine Interface Technology with the Basic Characteristics of Immersion, Interactivity and Conception [6]. It Comprehensively Utilizes Computer Graphics, Simulation Technology, Multimedia Technology, Artificial Intelligence Technology, Computer Network Technology, Parallel Processing Technology, and Multi-Sensor Technology to Simulate Human Senses Such as Vision, Hearing, and Touch, So That People Can Immerse Themselves in Computer-Generated in the Virtual Realm [7]. Ceramic Products, as the Most Common, Practical and Close to the Production and Life of Human Beings, Have Been with Humans for a Long Time, and with the History of Humans [8]. If You Make Full Use of Computer Technology and Use Virtual Reality Technology to Realize the Simulation of Ceramic Models, You Can Enable Users to Access the 3d Packaging Design Model Diagrams They Designed through the Network and Simulate Them. This Article Applies Virtual Reality Technology to the Research of Living Ceramics Design, and Analyzes the Application of Humanized Design in the Design of Living Ceramics Products.

2. GENERAL SITUATION OF HUMANIZATION IN LIFE CERAMICS DESIGN

There Are Obvious Differences in People's Living Habits among Countries, Nationalities and Regions. One Product is Applicable in One Region But Not Necessarily in Another. Living Ceramics Must Also Take into Account the Human Body Structure and Human Body Mechanics Principles to Make People Feel Comfortable and Convenient in Use. Ceramic Modeling Design is Produced When People Make Living Utensils. in the Continuous Ceramic Making Activities, They Have Formed Their Own Methods and Laws [9]. At the Same Time, Ceramic Modeling Design Has Strong Inheritance. the Generation of New Modeling Always Develops and Innovates on the Basis of Inheritance, Forming Different Modeling Structures and Styles from the Past [10]. the Premise of Humanized Design is to Maintain the Rationality of Product Function and Scientific Structure. the Designed Product Must Be Able to Adapt to People's Daily Behavior Habits, Conform to the Different Physiological Structures of Normal People and Special People, and Inject Humanized Factors into the Design. Ceramic Design Should Not Only Meet People's Normal Needs, But Also Seek Differences, Innovations and Beauties in Types, Shapes and Materials, Etc. to Give People a Strong Visual Impact and Enhance Their Purchasing Desire. Figure 1 is a Design of Packaging Structure Commonly Used in Ceramic Market.

Figure 1 Design of Packaging Structures Commonly Used in the Ceramics Market

In the humanized design concept, people are eager to decorate their environment and space with objects representing their taste and express their individuality. During the design, the basic elements such as processing technology, manufacturing materials and the like are firstly integrated, and the ergonomics professional knowledge is combined, so as to mainly consider whether it is easy to put, hold and use when in use. Thereby satisfy people's psychological and emotional experience and improving that durability of the product. Life ceramic products should make users feel spiritual pleasure, which is a higher level of humanized design. To reach such a state, we should start with artistry and culture. On the computer platform, various design information elements can be simulated and analyzed by using virtual reality technology, and the information can be effectively fed back through the dialogue mode of the object-machine environment, thus forming the establishment of a scheme and providing
necessary conditions for the next production of ceramic products. Considering various social and humanistic factors such as social reality conditions and users' application environment, the design language is visualized and the design emotion is materialized to ensure the feasibility of ceramic product production. Designers must comprehensively consider the product consumption market and carry out humanized design in combination with consumers' consumption concepts and living habits in the consumption market.

3. APPLICATION OF VR TECHNOLOGY IN HUMANIZED DESIGN OF LIVING CERAMICS

3.1 Building VR Display Platform for Ceramic Products

The colors of artificial materials can be added with color-rendering substances during the manufacturing process, so that the colors of the materials have certain effects. Just imagine whether a virtual ceramic product display platform based on e-commerce system can be constructed, so that consumers can customize personalized elements such as product shape and color according to their own needs through the e-commerce websites of ceramic enterprises without leaving their homes. And truly experience the fun of customizing products through interactive methods. The personality design of living ceramics is mainly expressed through modeling and decoration. The individual design of modeling can impress people more from the visual angle [11]. In engineering practice, in order to complete the measurement of the whole ceramic model prototype or physical object, surface data of different orientations of the model are obtained from multiple angles. Because the local coordinate system corresponding to each measurement is inconsistent when measuring different regions. The local coordinate system corresponding to each measurement must be brought into the same coordinate system, and the overlap between the two measurements must be eliminated. In the process of virtual reality design, every link serves the final real production [12]. Therefore, the feasibility principle of ceramic production should be taken into account in every design process.

The composition, microstructure and sintering process of ceramic materials are designed and determined according to the requirements of their service properties or mechanical properties. After removing the outliers, the mass fraction of dopant is taken as the input parameter of the network, and the viewpoint nodes are set in three different directions, which is beneficial to observe the ceramic model design simulation in different directions. As shown in Table 1, there are 15 groups of experimental data between composition, resistivity and flexural strength.

| Group number | Resistivity (μΩ·m) | Refractive intensity (MPa) |
|--------------|--------------------|---------------------------|
| 1            | 39.2               | 27.3                      |
| 2            | 38.5               | 22.9                      |
| 3            | 40.8               | 23.4                      |
| 4            | 39.6               | 25.7                      |
| 5            | 42.5               | 28.5                      |
| 6            | 37.1               | 33.2                      |
| 7            | 44.8               | 41.1                      |
| 8            | 42.5               | 35.4                      |
| 9            | 38.8               | 32.5                      |
| 10           | 46.3               | 25.8                      |
| 11           | 42.7               | 31.7                      |
| 12           | 43.5               | 30.1                      |
| 13           | 44.1               | 24.6                      |
| 14           | 42.1               | 27.3                      |
| 15           | 43.6               | 30.3                      |

Due to the huge data measured by measuring equipment, there are often many noise and noise points. This will affect the subsequent surface reconstruction. Before surface reconstruction, the measured data
should be denoised and simplified to obtain satisfactory data. Under the condition of modern experience economy, the humanized design of this kind of experienced virtual ceramic requires the design to integrate individual consumption demand and consumption experience into the life cycle of the product from the beginning. The unique artistic charm of virtual reality technology lies in that it can transmit the information of ceramic products to the audience in real-time, dynamic and all-round manner, and there is no time and place restriction. Let people feel the innovative achievements brought by science and technology, which can effectively attract the attention of the audience.

3.2 Using VR Reverse Technology to Realize Copy, Repair and Data Preservation of Ceramic Products

Realizing the use function is the basic requirement of domestic ceramic products, and making consumers use it conveniently and comfortably is the basic connotation of humanized design. As business competition becomes more and more fierce, people are pursuing more and more individualization, and the design of craft gifts is also demanding more and more. After a three-dimensional solid model of a ceramic model is established by solid design, the ceramic model can be output through an output mode. In order to get better simulation results, some modifications are made to background nodes and viewpoint nodes. Then in the newly generated file, you can see the program that the original model diagram has already generated. Importing and pasting the graphic file outputted by the reverse design of the pattern onto the CAD model outputted by the reverse design of the geometric modeling, and then performing the effect design to obtain the three-dimensional effect rendering map of the ceramic product. The positions of the converted ceramic models with single-section packaging are determined by the displacement and rotation angle relative to the original positions, so they must be repositioned.

After optimization, the hidden layer structure of 5 neurons was selected, with a total error of 0.4 after 5255 training. Using the experimental data of 5 doping schemes that did not participate in the training to predict and evaluate the network completed by the training, the comparison results of learning values and experimental values of flexural strength and resistivity are shown in Tables 2 and 3.

**Table 2** Comparison of Experimental and Predicted Values of Flexural Strength

| Group number | Experimental value | Predicted value |
|---------------|--------------------|-----------------|
| 1             | 42.9               | 43.5            |
| 2             | 43.6               | 44.1            |
| 3             | 45.8               | 46.3            |
| 4             | 43.4               | 44.2            |
| 5             | 44.0               | 45.1            |

**Table 3** Comparison of Experimental and Predicted Resistivity Values

| Group number | Experimental value | Predicted value |
|---------------|--------------------|-----------------|
| 1             | 23.57              | 22.75           |
| 2             | 24.86              | 25.91           |
| 3             | 31.64              | 30.89           |
| 4             | 29.32              | 30.64           |
| 5             | 31.78              | 28.32           |

Output an event to the time sensor. The time sensor then routes these times to other nodes according to the changes in time, causing these nodes to change accordingly:

\[ P = P(Y = 1) = F(\beta_i X_i) \]

(1)

The change of the ceramic kiln is mainly achieved by interpolation points:

\[ dF_r = \tau b dx \]

(2)

The following is the routing process for this simulation:

\[ \rho_i = d_i - \frac{T_{\alpha_i} - x}{d_i} \Delta x - \frac{T_{\beta_i} - y}{d_y} \Delta y - \frac{T_{\gamma_i} - z}{d_z} \Delta z + c \Delta \]

(3)
The positions of the converted ceramic models with single-section models are determined by the displacement and rotation angle relative to the original positions, so they must be relocated. The greatest advantage of using virtual reality technology to design craft gifts lies in the setting of materials. It is very easy to change the material effect material to make the model more real. When setting the model material, you can assign a certain material to a single model or part, or you can select multiple objects to assign the same material.

4. CONCLUSIONS
The creation of modern ceramic art must be based on humanization and provide people with artistic living articles and concepts. Humanization is increasingly becoming the core concept of life ceramic design. To a large extent, humanization is the key factor that determines the success or failure of products. Life ceramic designers need to be people-oriented, in order to meet people's comfortable, pleasant and personalized requirements. Virtual reality technology is a cutting-edge computer-aided design tool, which enhances the interactive virtual experience of users when observing products, so that they can more effectively feel the performance of products. By establishing a virtual reality model of ceramic products, the digital level of ceramic product design can be improved so that designers and customers can feel and identify the advantages and disadvantages of products through virtual models on computers. Suggestions for improvement are put forward to make it a satisfactory product for customers, thus avoiding unnecessary trial production process, saving time and cost, and improving customer satisfaction. Ceramic designers should deeply study Chinese culture, absorb the essence of its evolution, keep pace with the times in design concepts, innovate boldly, and create living ceramic works with distinctive Chinese characteristics by using virtual reality technology and the concept of combining humanized design with artistic design.

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