

Research on the Aesthetics of Ceramic Design Integrating Digital Technology

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Abstract: The rapid development of digital technology has brought intensive development opportunities to the traditional ceramic industry. Digital ceramic technology is now widely used in the ceramic industry, and its fast and accurate advantages are favored by more and more ceramicists. Digital technology enriches the creative techniques of ceramic art, and at the same time brings infinite possibilities to the performance of ceramic art. This paper studies the perfect combination of artistry and practicality in the decoration of ceramic design, and promotes the exploration of the design aesthetics of ceramic products.

Keywords: digital assistance, ceramic design, artistry, practicality

1. Introduction

Ceramics occupy an important position in Chinese history. It can be said that the history of ceramics development and the history of Chinese civilization were formed at the same time [1]. In various historical periods, ceramics have been endowed with different cultural meanings, which are reflected in various aspects such as the shape and decoration of ceramics. With the deepening of the industry's cognition, many new products in the field of ceramics have been developed using digital assistance technology [2]. At present, to further improve the existing technology related to ceramic design to develop the world's highest level of ceramic manufacturing technology is the goal of today's ceramists. Ceramic culture is one of the long-standing traditional cultures inherited from ancient my country, and its excellence and artistry have been recognized [3]. This traditional ceramic culture, through the integration of modern visual art media, gets rid of the framework of ceramic field or craftsmanship, and tries to transform it into the expressive material of creation. Especially in digital aided design, in order to maintain the traditional atmosphere and the difference of design and ensure the competitiveness of products, we constantly try to integrate the inherent meaning and appearance of traditional ceramics. The ceramic design technology is to make plaster molds by cutting the 3D data produced on the computer.

2. Creative thinking of ceramic art design

2.1. The creative thinking of traditional ceramic design

The fusion of ceramic modeling and digital aided design can complete the aesthetic exploration of ceramic modeling. First, the long-standing traditional ceramic modeling became the modeling motivation to enrich the range and possibilities of modern media modeling. Second, the ceramic shapes of traditional media appearing in ancient tombs or traditional paintings are used as secondary materials, while modern digital-aided design is used as the central material for performance, which shows different understandings and explorations of ceramic design. Third, ceramic modeling is not only used in art works such as paintings, sculptures, photographs, and media, but also in digital-aided design centered on practicality, such as crafts, products, and architecture. Fourth, the ceramic modeling integrated with digital-aided design is a theme developed and designed considering the practical and sensual daily use of the combination of tradition, craftsmanship, high taste, storyline, etc. The coexistence of modern media and traditional shapes provides the basis for inheriting our cultural identity and spiritual values.

2.2. Creative thinking of contemporary ceramic design

Using digital-assisted technology to research and design ceramic products can better demonstrate the expected effect of ceramic products [4]. Chinese contemporary ceramic design is simple and fashionable in terms of form. From the color point of view, the glaze color is soft and exudes a sense of mystery. One of the biggest features of digital aided design in ceramic art design is that the design result has a strong sense of geometry. Traditional ceramics are too round. With the change of modern people's aesthetics, the demand for the shape of ceramic products has also changed. Modern aesthetics are characterized by smooth lines and a strong sense of composition. The geometric beauty of modern ceramic products is one of the characteristics that ceramic artworks satisfy the public's aesthetics. Digital-aided ceramic product design can use the intersection of curves and polylines to model ceramics and increase the geometric sense of ceramic products. The alternately rotating lines add modern elements to ceramic products, which are more in line with modern people's aesthetics for simple and angular products, enhance the audience's use experience and visual experience, and make the design and production of ceramic products in line with modern aesthetic development trends. Geometric ceramic products will become a new field for the development of the ceramic industry in the future, and will lead the new aesthetic trend of future ceramic product design.

3. The role of digital assistance technology in innovative ceramic design

3.1. Digital assisted technology and ceramic innovative design

The wide application of various digital aided design software in today's ceramic art design has brought new creative methods and art forms [5]. Therefore, the study of ceramic art helps guide people's understanding of culture. For the design of ceramic art sketches, due to the participation of digital aided design, it was difficult to copy became easy to copy, the original static ceramics became dynamic ceramics, the original silent ceramics became sound and light ceramics and many more. With the rapid development of digital aided design vision and 3D modeling technology, digital ceramics has become a research hotspot due to its advantages of editability, time saving, labor saving, and material saving. Especially in recent years, with the increasing maturity of digital aided design, people's demand for personalized customization of ceramic products has increased dramatically. At present, the development and inheritance of the art field is influenced by the development of science and technology. Throughout the long history of the development of ceramic craftsmanship, it is found that the manifestations of ceramic craftsmanship in different times are different, and different factors restrict or promote the means and forms of artistic creation. To investigate the way in which ceramic culture is expressed and consumed in modern design. Specifically, the cultural exhibition will develop a design analysis model, and based on the analysis framework, analyze the characteristics of each cultural level of ceramic product design. The first research method is to examine the meaning of culture through the literature, the modern design of ceramic art is analyzed on the applicable methods, and the modern product design mode of ceramic art is developed. Second, selected products of modern design based on the case study of ceramic cultural background. Applying the context of traditional ceramic culture, it pays more attention to the commodity value of modern life in terms of practicality and function than the purpose of decoration. In terms of reflection elements, the method of re-creation is also widely used, which can be interpreted as a reinterpretation of traditional values, attracting people's attention to the traditional culture of ceramics, and achieving differentiation by improving ceramic design.

3.2. The role of the open platform of digital assistance technology

Craftsmen can feel a sense of accomplishment and self-esteem after completing their works, so there is an urgent need to use a variety of production methods for creative ceramic craft design education [6]. Modern ceramic design is a part of industrial design. Ceramic design is no longer a simple physical form, but covers the functions, economy, and aesthetics caused by it, and has profound social significance. Design thinking is the most basic method and can best reflect the active degree of innovation. The digital aided design of ceramic works is conducive to the construction of complex modeling structures. In this process, it is necessary to digitally process the set ceramic three-dimensional model, adjust the three-dimensional hierarchical part of its internal structure, and then use 3D printing to express the complex characteristics of the ceramic, which cannot be achieved by traditional hand-designed ceramic production. The digital aided technology of ceramic works can not only design complex structures according to customer's requirements, but also customize ceramic

works with complex structures in batches. For example, in the digital-aided design process of ceramic teacups, a smooth teacup mold can be modified to give it an uneven appearance, so that the appearance and shape of the ceramic teacup can be complex, and then mass-produced by printing technology.

Ceramic culture is one of the traditional cultures passed down from ancient times. Its excellence and artistry have been recognized, and it is enough to represent the culture and art of our country. This traditional ceramic culture, through the integration of modern visual art media, gets rid of the framework of ceramic field or craftsmanship, and tries to transform it into the expressive material of creation. Especially in digital technology, in order to maintain the differentiation of traditional atmosphere and design and ensure the competitiveness of products, we constantly try to integrate the inherent meaning and appearance of traditional ceramics. This research was started by recognizing the possibility of traditional ceramic modeling through fusion with digital technology. The modern significance of traditional ceramics is explored through the expansion status of traditional ceramics modeling integrated with digital technology. First, the long-standing traditional ceramic modeling became the modeling motivation to enrich the range and possibilities of modern media modeling. Second, the ceramic modeling of traditional media appearing in ancient tombs or traditional paintings is used as a secondary material, while modern digital technology is used as the central material for performance, and different understandings of traditional ceramics can be seen. Third, the expansion of traditional ceramic modeling is possible not only in art works such as paintings, sculptures, photographs, and media, but also in digital technologies centered on practicality, such as crafts, products, and architecture. Fourth, the traditional ceramic modeling combined with digital technology is a theme developed and designed considering the practical and sensual daily use of tradition, handicraft, high grade, rareness, fermentation, storyline, etc. The coexistence of modern media and traditional shapes provides the basis for inheriting our cultural identity and spiritual values. In the era of globalization, the modern expansion of traditional ceramics is expected as a differentiated content with inherent characteristics and sensibility and a storyline.

4. The difference between digital ceramics and traditional ceramics

In the digital age, there is a huge difference in the creative process between digital ceramics and traditional ceramics. Although digital ceramics transforms traditional physical ceramic creations into software designs, there are differences in nature between the two due to different techniques and sequences. Light and distance also affect observations. In addition, the creator's observation in digital creation is not limited by the volume and space of the ceramic, which effectively avoids the influence of the traditional large-scale ceramic space angle and viewing distance on the creator. The difference between digital ceramics and the traditional ceramic creation process, which requires ceramic household hands and tools to shape ceramics. Digital ceramics means allowing the ceramicist to save energy in the creative process and giving the ceramicist more energy to think. In the process of creation, ceramicists can precisely design the geometric shapes of ceramics without being limited by site, material and space. Infinite modifications to ceramics are possible.

The emergence of 3D scanning technology breaks the traditional boundary between physical and virtual, and realizes the free conversion of virtual and reality. It can build its own digital model by scanning physical materials, and can directly design and design the digital model in the creative process. Modified [7]. Using these devices enables greater accuracy, greater convenience, and lower costs in the process of converting digital models into physical finished products. While digital ceramics isn't limited to physical carriers, that doesn't mean it's flawed in visual expression. In recent years, many researchers have begun to study the formation of ceramics according to the characteristics of ceramics. The ceramic art generation algorithm based on the 3D model, based on the outline of the current line of sight and the model boundary as the feature points, uses the expansion and erosion technology in the image processing to process the feature points, and compresses the overall ceramic art and characteristic areas with different heights. Get ceramic art effects. Feature lines are extracted from the 3D model to obtain a 2D feature line graph. By smoothing the three-dimensional model, the image processing method is directly applied to the drawing of the characteristic line, which realizes the retention and enhancement of the detailed information, and the processed lines are etched into the background plane to obtain the ceramic art. Using geometric information and visual cues to assist the generation of ceramic art, ceramic art and optimization effects make the generated ceramic art more natural by minimizing the weighted energy function, which can well reflect the shape changes between lines, but the optimization of this method The process is computationally intensive.

5. Conclusion

The research shows that the practical value of ceramic design and aesthetic function are complementary, and the necessity of aesthetics is no longer an afterthought in the performance of ceramic design, but has the same status as function. The ceramic art based on digital aided design inherits the original rules of ceramic art creation, and at the same time breaks through the limitations of traditional ceramic art. It shows the performance improvement of digital aided design for ceramic art design. The application of digital-aided design has changed the way of presentation of ceramics, bringing an exquisite visual feast to the audience.

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