

Digital Intelligent Paper-Cutting Art Design Based on the Needs of Social Aesthetic Education

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Abstract: Exploring the potential social aesthetic education needs of paper-cutting art, distinguishing the logical relationship between paper-cutting art design and social aesthetics education, discussing the existing problems of paper-cutting art inheritance and development, developing paper-cutting art digital intelligent field modeling, and promoting the realization of paper-cutting art design social aesthetics function. Based on the aesthetic education value of paper-cutting art and its artistic performance characteristics, efforts are made to construct digital intelligent generation programs, and the paper-cutting art design process is transformed into a digital intelligent system, that is, scientific application of digital intelligent technology and artistic techniques, and innovative creation of paper-cutting art. Improve the aesthetic ability of the public as a whole and sublimate the connotation of social aesthetic education.

1. Introduction

The art of paper-cutting carries a wealth of traditional Chinese cultural connotations and occupies an irreplaceable core position in social aesthetic education. Especially in recent years, with the change of modern technology, the field of Chinese art is expanding and developing in the direction of digital intelligence. Paper-cutting art also needs to keep pace with the times. Based on the needs of social aesthetic education, a comprehensive understanding of contemporary art design and digital intelligence context The current status of paper-cutting art design and dissemination[1], following the aesthetic laws of social aesthetic education, combining the characteristics of intelligent digital technology, analyzing, repairing and innovatively disseminating the heavy cultural connotation of paper-cutting art, and creating digital intelligent paper-cutting art that can meet the aesthetic pursuit of the public. Design and actively disseminate it to make it glow with new vitality under the background of the new era.

2. The Contemporary Needs of Social Aesthetic Education for Paper-Cut Art Design

Drawing lessons from history, paper-cutting is a common folk art form that originated in the Tang Dynasty [2] and has a profound influence in the field of culture and art. After continuous evolution and development, the art of paper-cutting has gradually formed unique styles and genres, which can well reflect the social taste of elegance and common appreciation: whether it is the prosperous dragon and phoenix under the moon before the flower, the Chen Aichangpu during the Dragon Boat Festival, or the reunion of the Mid-Autumn Festival Haoyue chrysanthemum fragrance can help the public to contact beauty, feel beauty and then experience beauty through exquisite paper-cut art works.

In recent years, under the unique background of China's social transformation, the need to enrich the spiritual life of the public through social aesthetic education reforms has become stronger. This is an inevitable trend in the development of social aesthetic education and a new opportunity for the modern development of paper-cutting art. However, from the perspective of the traditional design and communication trend of paper-cutting art, it is obvious that it has been unable to adapt to the demands of modern design communication and meet the increasingly updated social aesthetic needs of the public. How to carry out digital intelligent design innovation for paper-cutting art [3], and use paper-cutting art design innovation to promote the realization of the function of social aesthetic

education, so that it will gain more attention and recognition in the new era, is an urgent problem to be solved in the sound development of paper-cutting art.

3. The Connotation of Paper-Cutting Art and the Logical Connection of Social Aesthetic Education Value

The conception, conception, material selection, and modeling of the paper-cut art design can fully reflect the Chinese national spirit and social aesthetic taste of our country, and fully demonstrate the simple and beautiful aesthetic consciousness and value orientation of traditional Chinese culture. Therefore, the two are closely related.

3.1 Inherit and Protect Social Culture with the Characteristics of Visual Graphics

The art of paper-cutting pays particular attention to the implication of visual graphics, and often uses different materials to cut different patterns to convey the will of differentiation, to embellish the environment, beautify life and convey expectations. For example, the paper-cutting of dragon and phoenix means happiness in marriage; magpie persimmon. The paper-cutting with the lotus flower symbolizes happy events; the crops of rice, wheat, corn and other crops are cut out to pray for a good harvest; the paper-cutting pattern of Dielianhua (Figure 1) is to show the butterfly plot in the legendary story of Liang Shanbo and Zhu Yingtai. Used to bless husband and wife and beauty.

Through the art design of paper-cutting, paper-cutting is endowed with a deeper connotation, which fully expresses the compliment of the paper-cutting maker to society and the love of life. Making full use of the implied attributes of the visual graphics of paper-cutting art will make paper-cutting works have richer cultural connotations, thereby strengthening the artistry and vitality of paper-cutting art design works, and promoting the formation of a good aesthetic taste and atmosphere in the whole society.



Fig.1 Dielianhua Art Paper-Cut

3.2 Entrust the Vision of Maintaining Social Order with the Function of Emotional Expression

The art of paper-cutting is an important component of national culture and art and the core carrier of national spirit. Its romantic expressions, various fictional situations, creatively shaped the physical prototype into a paper-cut pattern with both aesthetics and emotional expression effects, allowing the public to obtain spiritual satisfaction from the beauty of the paper-cut art design concept and compensate for its reality. The contrast.

Therefore, the various styles of paper-cutting art works designed by integrating the meanings of social peace, national prosperity, happy life and the pursuit of truth, goodness and beauty can also be regarded as effective emotional expression and display of the spirit of unity of the Chinese nation and national aesthetic characteristics. The reasonable use of paper-cut design to reflect the characteristics of social aesthetic education will help to balance the content and value of paper-cut art works and better maintain national cohesion and social order. For example, the paper-cut pattern of Songmei can reflect the noble and tenacious spirit of the people of the Chinese nation; the paper-cut of the lotus and the bottle embodies the prayer for a peaceful pattern, and can fully reflect the good wishes of the compatriots of all ethnic groups for social stability [4].

3.3 Promote the Integration of Digital Technology with Paper-Cut Visual Thinking

Paper-cutting is a flat pattern formed by intertwining various lines and cutting or engraving on paper with a knife. Its artistic design concept depends on the paper-cutting producer's instinctive perception of reality and his own specific thinking pattern. Through the unique and exquisite techniques of the paper-cut maker, the three-dimensional image with a sense of orientation and space can be artistically displayed in a two-dimensional plane, and the perspective effect is subtly presented in the paper-cut design through the visual aesthetics and thinking of the paper-cut maker[5]. However, this kind of design thinking and ability is not something that most people can master and use in a short time. At this time, it is necessary to use digital intelligent means to design and set corresponding procedures to reduce the difficulty of paper-cutting art design and production, so as to better carry out paper-cutting. Inheritance and spread of art.

4. Advantages of Digital Intelligent Paper-Cutting Art

4.1 Conducive to Enriching the Display and Communication Forms of Paper-Cutting

Due to remote areas and underdeveloped connections with the outside world, the spread of paper-cutting art has always been difficult to reach the ideal level in the past. At this time, the use of digital intelligent technology to copy folk paper-cutting art can better avoid similar problems. Its intelligent design and cloud storage function can better restore and copy the original information of paper-cutting art design (including text, image source and video, etc.). Both the design work and the creative process can be better recorded. It is convenient for users to import basic paper-cut patterns at any time through the database, and then cut and make paper-cut patterns through some simple operations to create new paper-cut patterns. In this way, it can not only solve the problem of limited exhibition space for traditional folk paper-cut works, but also use digital intelligent technology to promote the innovative design and research of paper-cutting crafts, which will help give full play to the positive role of digital intelligent technology in the inheritance and development of folk paper-cut art. It is convenient for the public to study and collect paper-cut art works, and extensively deepen the open social aesthetic education influence of folk paper-cut culture.

4.2 The Realization of Social Aesthetic Education Functions Conducive to the Art of Paper-Cutting

The paper-cut design with digital intelligence tends to break through the limitations of the two-dimensional model and use the three-dimensional form design to make the paper-cut work more in line with the aesthetics of the new era, stimulate the various sensory systems of the viewer, and enhance their aesthetic ability. At the same time, the use of digital technology to disseminate can also quickly search the paper-cutting methods of different countries and regions on the Internet, so that it can be better integrated into my country's paper-cutting design techniques, and the creation level can be updated, so as to enhance the public's appreciation of works and understanding of the aesthetics of works. And ability to increase the public's potential interest in paper-cut art design, promote the organization of art promotion activities, and realize its social aesthetic education function and effect.

4.3 Conducive to the Spread of Digital Folk Paper-Cutting Art

Digital intelligent technology is the main technical carrier medium for the dissemination of paper-cutting art in the information society [6]. Through digital intelligent integration technology, paper-cutting information can be digitally designed and displayed on the Internet, making it easier for the public to compare. This paper-cutting art design information It can be visited and watched at any time without being restricted by time and place. The integrated digital paper-cutting art and its design will become more humane, which can not only facilitate the public to learn paper-cut culture, but also facilitate the popularization and promotion of folk paper-cut cultural knowledge.

5. Analysis of Digital Intelligent Paper-Cut Design Based on Social Aesthetic Education

If the paper-cutting art design wants to realize the digital intelligent transformation, it needs to start from the analysis of the paper-cutting art design structure, based on the aesthetic education value of the paper-cutting art and its artistic performance characteristics, strive to build the digital intelligent paper-cutting generation modeling, and apply simple and easy-to-operate paper-cutting generation software. The paper-cutting art production process is transformed into a digital intelligent design generation program to provide digital intelligent design support.

In order to make the new physical contours and artistic characteristics of the paper-cut natural image coincide with the paper-cut process, the process of digital intelligent paper-cut generation also needs to go through the steps of image extraction, contour matching, shape matching, and pattern migration. First, input the natural image and the paper-cutting system that is known to have the corresponding content, and perform segmentation and vectorization processing on the natural independent image to be input to obtain the target image; then, through similarity clustering, use the shape matching method to identify the space of similar patterns. Distribution mode, find similar paper-cuts from the paper-cut library and analyze them, then combine the two through pattern migration, transform the input paper-cut images into digital intelligent design modeling for display, and complete the new paper-cut art design in an orderly and scientific manner, Generate paper-cutting art design modeling and image source.

The paper-cutting design is transformed into a digital intelligent design modeling with a tree-like hierarchical structure composed of root nodes, pattern layers, similar layers and element layers (as shown in Figure 2), so as to perform bottom-up orderly based on the needs of social aesthetic education operating.

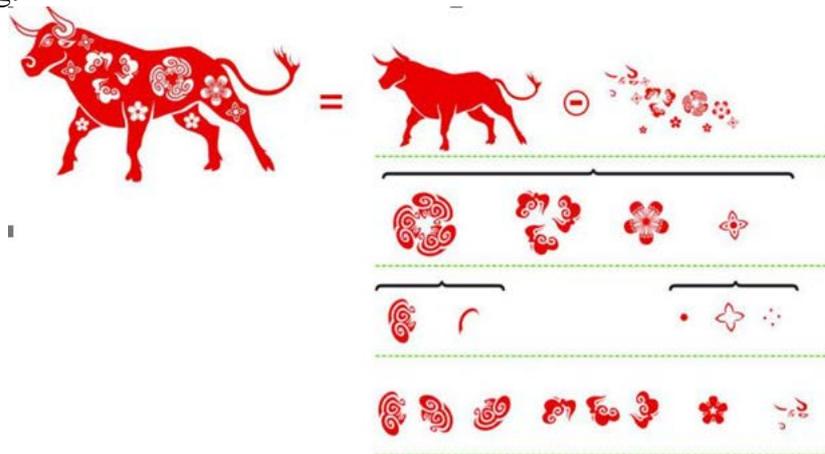


Fig.2 Digital Intelligent Model of Paper-Cutting Art

Each tree-like hierarchy in this modeling corresponds to different steps and functions of digital intelligent paper-cutting art design generation:

5.1 Element Layer

Extract the edge pixels of the paper-cut scanned image from the image that needs to be converted to paper-cut, and use the gpb contour detector to obtain the contour of the target object. By setting different intensity thresholds, an edge intensity map with controllable details is obtained, and at the same time through denoising, vectorization, and iteration Energy minimization and segmentation are used to obtain each paper-cut pattern element, that is, the shape element and pattern structure represented by the known paper-cut spline, so as to gradually improve the basic elements in the element layer to facilitate paper-cut pattern selection and subsequent processing.

5.2 Similarity Layer

Based on the element layer, the improved shape context descriptor is used to calculate the similarity between the pattern elements, supplemented by the continuous contour point distribution histogram and the EMD distance shape matching algorithm to cluster the paper-cut patterns, and the patterns with similar contours are regularly matched. Under the principle of repeating and orderly

artistic characteristics of paper-cutting, try to find the most similar known paper-cutting in the paper-cutting library.

As shown in Figure 3, the pattern on the left is the target paper-cut image segmented from the input natural image, while the pattern on the right is the most consistent match with the known paper-cut similarity retrieved from the existing paper-cut element layer and database. Paper cut image.



Fig.3 Similarity Matching of Target Paper-Cut Images

5.3 Pattern Layer

Pattern is one of the important elements of paper-cutting art, and its spatial distribution is often formed by a variety of pattern elements according to a specific spatial distribution law. The main function of the pattern layer is to use digital intelligent tools to detect the specific spatial distribution patterns of similar paper-cut patterns, so as to identify the required paper-cut patterns and describe their patterns, so as to intelligently edit and transfer the corresponding patterns.

Taking the template object “cow” selected this time as an example, we can consider using an improved automatic matching algorithm to find the object, mark the corresponding position in the object, and move the physical pattern to the specified position, and the modeling extraction pattern will be displayed as Shown in Figure 4.



Fig.4 Modeling and Extracting Patterns

5.4 Root Node

The root node hierarchy includes the outer contour of the entire graph and all internal pattern elements, which can realize the intelligent judgment of the overall geometric connectivity of the paper-cut. With the perfect content of the root node, the system can automatically transform the delivered paper-cutting into a tree-like hierarchical structure with built-in paper-cutting pattern structure patterns, thereby completing the practice of digital intelligent modeling of paper-cutting art.

As mentioned above, the art of paper-cutting can smoothly realize the transformation of its own expression form through digital intelligent modeling. Sometimes it only needs to load a natural image, separate the paper-cut contour and internal pattern from the element layer, and perform shape matching and matching from similar layers. Recognize, complete the migration of similar paper-cut physical patterns from the pattern layer, and realize the rapid judgment of the overall geometric connectivity of the paper-cut from the root node, so that the new physical contours and artistic characteristics of the paper-cut natural image are consistent with the paper-cutting process, and new generations are generated by digital intelligence. Paper cut. Not only is it easy to highlight the repeated and orderly patterned structural characteristics of paper-cutting patterns, but it can also

greatly reduce the difficulty of paper-cutting art design, effectively improve the efficiency of digital intelligent editing of paper-cutting art, and systematically display the agility of traditional paper-cutting art, making the design more three-dimensional, vivid and intuitive Clear, and then better redesign and new dissemination of digital intelligent paper-cutting art from the perspective of social aesthetic education.

5.5 Design and Application

As a true portrayal of my country's cultural concepts, the art of paper-cutting deeply appeals to the needs and emotions of the masses in real life in its aesthetic connotation and form. It uses the language of art symbols to instruct the masses to seek truth from kindness and has a distinct social aesthetic value. [7].

However, due to the development of the art of paper-cutting, in order to make the art of paper-cutting more vital and influential, it is necessary to devote attention to the digital intelligent application and dissemination of the art of paper-cutting, and actively enrich the digital intelligent paper-cutting art that is compatible with the aesthetic education needs of modern society. Show the form, expand the intelligent digital communication channels of paper-cutting art, and promote the deepening of paper-cutting art's social aesthetic education function.

Consider following the "digital Dunhuang" propaganda model, transforming the corresponding paper-cutting art design concept from design thinking into short video information, so that it migrates from a closed paper space to a digital intelligence form. Through interactive design experience and paper-cut design creation participation, viewers can deeply immerse in the digital intelligence situation brought by paper-cut art design, understand the paper-cut design process, and feel the charm of paper-cut art design. The patterns obtained from paper-cut art design modeling can also be reasonably embedded into the smart home design, and the paper-cut hollow art, light and shadow changes and spatial depth can be used cleverly to make the smart home design more visual and artistic. Based on the social aesthetic education, the paper-cut art design is promoted to the society A good trend in the development of digital intelligence technology.

6. Conclusion

This article attempts to comprehensively use artistic techniques and digital intelligent technology to make paper-cutting art use digital intelligent modeling and application to smoothly transform its expression form, and create a structure that can effectively benefit paper-cutting art design based on social aesthetic education in the context of digital intelligence. System [8]. In this way, the original form of paper-cutting art can be maintained, and the beauty and aesthetic laws of contemporary paper-cutting art can be followed. It is not only convenient to highlight the repeated and orderly pattern structure characteristics of paper-cutting patterns, but also enriches the expressiveness of paper-cutting art creation with cultural symbols of paper-cutting art. Significantly reduce the difficulty of paper-cutting art design, effectively improve the efficiency of paper-cutting art digital intelligent editing, so that it can better carry out artistic design from the perspective of social aesthetic education, and it has trans-age significance for the spread and development of paper-cutting art digital intelligence.

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