

Research on the Vision Reconstruction and Cultural Translation of Tang Palace Ladies under the Digital AIGC Empower

Shiqiu Gu, Jiahuan Cheng

Sanjiang University, Nanjing, Jiangsu, 210012, China

ABSTRACT

As an important representative of ancient Chinese painting, Tang Palace Ladies reflects the social and cultural background of the time. At present, the protection of ancient painting art in China mainly depends on manual copy and physical protection, which is inefficient, prone to errors, and damaged over time. The artificial intelligence generated content (AIGC) can learn the painting characteristics of the Tang dynasty ladies' portraits intelligently through analyzing a large number of ancient painting data to realize the automatic learning of the painting characteristics of ancient ladies to protect the original appearance of ancient paintings. Therefore, this paper will study how AIGC accurately reproduces the vision effect of the Tang dynasty ladies' map and effectively transmits its cultural value to promote the innovation of excellent culture and art in the change process.

KEYWORDS

AIGC empower; Tang palace ladies; Vision reconstruction

1 Introduction

Due to the fullness of their figures, the exquisite patterns of their clothing, and the unique use of colors, Tang Palace Ladies are important materials for studying the social life of the Tang dynasty. These paintings not only recorded the daily life of the Grande Dame but also carried the aesthetic and social norms of the time. Although modern scanning technology can obtain images of ancient paintings, the cultural interpretation of the details of paintings is still mainly dependent on artificial means. Especially when these images are in the contemporary dissemination process, the ancient and the modern aesthetic differences make it extremely easy to cause reading deviation. The existing AIGC technology in the generation of Tang palace ladies often only stays in the superficial form of imitation; it is difficult to grasp the cultural connotation accurately. Therefore, this paper will explore the vision restoration of the AIGC image and analyze its cultural connotation transformation mechanism to promote the effective dissemination of traditional art in modern society.

2 The Conceptual Connection Between AIGC and Tang Palace Ladies

2.1 The Characteristics of AIGC Technology in Artistic Generation

Artificial intelligence-generated content (AIGC) technology learns and grasps the regularity of artistic creation by analyzing many screen works. This technique can automatically analyze the collocation of color, the direction of the line, and the photographic composition of a painting in depth. Moreover, this knowledge can be converted into data for direct application. For example, when people input three-dimensional commands to combine the above design with the style of "Tang dynasty court ladies," the system will immediately call up the typical elements of Tang dynasty ladies' paintings, features such as a full face, a flowing dress, and high bun are combined to create a picture. The processing standards are established within the technology. When drawing complex patterns, the classical designs of the Tang dynasty, such as composite flowers and scroll design, are directly selected, and the design concept and technology are combined with the designer's hand-painted creative ideas. It mainly plays three roles in the practical application: giving vitality to the creation, allowing the original static picture to show the dynamic effect of the wind-blowing clothes, and Providing flexible modification space. After generations, the characters' posture or the color of their clothes can also be adjusted, ensuring the continuation of the style. The new works always have a full and mellow aesthetic tone unique to the Tang dynasty. This allows technology to reproduce ancient paintings and assist artists in creating new works that conform to traditional aesthetics, opening up new ways for cultural inheritance^[1].

2.2 The Core Artistic Features of the Tang Palace Ladies

The plump and voluptuous female figures are the most distinctive feature of Tang Dynasty court ladies' paintings. They wore high, tiered buns and thin, gossamer-like garments. These visual symbols became status symbols of the prosperous Tang era. The painter delineates the figures' outlines with smooth and full arcs, conveys an elegant charm through the "S"-shaped stance with a slight waist twist, and demonstrates unique ingenuity in color application. Mainly using cinnabar

red and stone blue pigments made from minerals, he repeatedly blurs and diffuses them to create a gem-like lustrous effect and then outlines the clothing patterns with gold powder to enhance the sense of luxury. In the scene design, the common woman standing in the garden uses the screen and the lake stone to separate the different spaces, suggesting the transformation from the banquet hall to the back garden activity. At the same time, cultural symbols are hidden in the picture. The scene of the noble lady teasing the pet dog reflects the cultivation of the lady advocated by Confucianism. The flying scarf on the shoulder of the lady in the Dunhuang mural reflects the influence of foreign Buddhist art. These features recorded the daily life of aristocratic women in the Tang dynasty: scenes such as dressing, visiting gardens, and admiring flowers were artistic creations and historical windows reflecting social features. They conveyed the Open Era's aesthetic pursuit and cultural confidence^[2].

2.3 The Rationality of Digital Technology Intervening in Traditional Culture

There are two key problems in copying ancient paintings by hand. The silk and mineral pigments used in the Tang dynasty will fade and embrittlement after thousands of years, and future generations will have to guess the complementary colors far from the original appearance. Painters of different eras would unintentionally bring in the aesthetic preferences of the time, such as the Ming dynasty copies often appear not to belong to the Tang dynasty of the square collar clothing. Digital technology provides solutions at multiple levels: at the protection level, the damaged ancient paintings are scanned and archived with high-definition equipment to preserve the actual color of the existing state; At the research level, image analysis software is used to compare the original works of different painters, and statistical analysis of stroke direction is used to reveal the differences in personal styles. At the communication level, ancient painting elements are integrated into modern media, such as "Night Banquet in Tang Dynasty Palace" in the performance of the digital background wall, letting the audience in the dynamic garden of the Tang dynasty. The whole process adheres to the principle of "Science and technology serve the culture." accurate digital records preserve the original style, avoid the loss of historical information, and through digital exhibitions, mobile games skin, and other new forms, let the young people with the familiar way contact Tang dynasty esthetics, causes the ancient culture to obtain the new life truly in the modern society^[3].

3 Aigc-Driven Vision Reconstruction Path

3.1 Digital Processing of Original Images

The main goal of original image digital processing is to build a computational model that can accurately reflect the entity's state. The processing flow begins with physical protection and standardized acquisition: a non-contact high-precision scanner obtains images in blocks in a constant temperature and humidity environment. The equipment can deal with the imaging requirements of different materials through multiple spectral channels, such as using the difference of visible and infrared light penetration to effectively separate the silk substrate and mineral pigment layer and capture the historical trace information, such as tiny cracks. During the scanning process, the material property data were recorded synchronously, and the key features, such as pigment oxidation area and spun silk fracture trend, were highlighted. After completing the basic acquisition, the spatial calibration is carried out. The control point matching technology splices the regional scanning data into a complete picture. The geometric correction of the deformed canvas surface is carried out to restore the original plane state at the creation time. Finally, a digital file is generated. The basic vision layer stores the current color and form, the raw material analysis layer records the chemical properties of mineral distribution, and the structural topology layer labels the connection logic between lines. In this stage, it is necessary to ensure that the digital carrier not only completely preserves the physical state of the historical objects but also enables the computer to identify the overlapping levels of restoration strokes in different periods of murals, which lays a parsed data foundation for subsequent processing^[4].

3.2 Realization Process of Stylization Generation

The key to the formation of stylization lies in constructing the calculation rule system of Tang dynasty painting characteristics. In the first stage, the core rules of the standard sample were analyzed: measuring the floating interval of the head-body ratio of the figure (such as Lady 1:6.2-6.8), quantifying the curvature change threshold of the clothing line (scroll design peak spacing ratio of 0.3-0.6), the hue saturation tolerance zone of lapis lazuli and other mineral colors is defined (H215 °-230 ° is regarded as effective ultramarine blue). A rule engine is built based on the feature set: the new shape is constructed to match the proportional interval automatically, the fabric dynamics algorithm simulates the fabric fall effect to simulate the gravity response, and the color filling uses histogram mapping technology to reproduce the gradual change characteristics of mineral pigments. The system has a feature priority mechanism. For example, the

composition weight is increased to 75% when the architectural scene is drawn, and the paradigm accuracy of the pose is prioritized when the character is generated. Under the premise of maintaining the core aesthetic symbols (such as the topology invariance of composite flowers), the process achieves creative extension through parametric adjustment. When representing the flying body, the dynamic tension is generated by increasing the length of the sleeve ribbon by about 15%, depicting a static guard of honor that reinforces the symmetrical precision of the keyūra accessories. This constrains the innovation mechanism to protect the traditional vision gene and meet the needs of multimedia creation.

3.3 Effect Design for Vision Output

In order to ensure the inheritance of culture and the landing of technology, vision output needs multi-dimensional examination. First, the structure is checked to check that the image elements are consistent with the Tang dynasty vision grammar rules, including the basic elements such as the position logic of the face and the scale of the architectural components. Aesthetic Design: evaluation by experts in art history and conservation, style consistency checks on randomly generated samples, the physical properties of mineral pigment layering, and the precise expression of pencil texture are investigated. On this basis, the application environment experiment is carried out. Through the simulation of light and shadow flow and perspective change in real scenes, the physical rationality of real-time rendering of each element is evaluated to ensure that the authentic silk clothing does not deform in the moving environment. Among them, cultural restoration mainly constructs a complete closed loop from the three dimensions of symbol accuracy, artistic expression, and media adaptability, which ensures the rigorous inheritance of historical context and the integration of modern media^[5].

4 The Logic of Cultural Translation of Generated Images

4.1 Symbolic Meaning Transformation of Formal Elements

In order to adapt to the understanding of modern people, it is necessary to re-interpret the pattern elements in ancient art. The specific images in the paintings of the Tang dynasty usually have specific cultural connotations, which need to be transformed into general symbols that modern people can understand. For example, a *Paeonia x suffruticosa* Andrews symbol of noble status can now be transformed into a vision symbol of vitality. The process of transformation follows three steps: identifying the original meaning of traditional elements, determining their original function and cultural background through the investigation of historical documents, stripping the old social attributes, and getting rid of the concepts related to feudal hierarchy and religious fetters, such as transforming the dragon pattern from an exclusive symbol of the emperor into a symbol of cultural inheritance; to take the emotional experience shared by all humankind as a new carrier, such as transforming the religious meaning of Buddhist handprints into a modern gesture language of peace and friendship. In terms of specific operation, the plant wenshi emphasizes the vitality of nature, the animal imagery emphasizes the concept of harmonious coexistence, and the geometric wenshi maintains the orderly sense of vision and weakens the implication of hierarchy. This transformation makes the traditional vision elements gain new life in the modern context.

4.2 Dialogue Between Ancient and Modern Aesthetic Concepts

The key to the aesthetics of the Tang dynasty and modern aesthetics is to find a balance in the vision habit, not to copy the ancient or modern methods blindly but to seek mutual recognition of the performance techniques. By integrating textual research and fieldwork, the cultural connotations and vision features of the images of ladies in the Tang dynasty are sorted out, combined with AIGC tools to carry out the content redesign of illustration, pattern, poster, cultural creativity, dynamic AR interaction, three-dimensional IP image, etc., to construct a multi-dimensional vision design that can carry out "Ancient and modern" and "Humanities and technology" dialogue, it involves a series of contents such as illustration, poster, pattern, cultural creativity, dynamic AR interaction, three-dimensional IP image, etc.. With the help of digital technology, the dynamic narrative and immersive experience of traditional paintings and wenshi can be achieved, creating more possibilities for activating traditional culture, the modern deduction of Oriental aesthetics, and the spread of globalization.

4.3 The Adaptive Adjustment of Intercultural Communication

In order to make audiences from different cultural backgrounds understand the art of the Tang dynasty, various improvements need to be made. First, the symbolic system should be simplified: the imagery of global general knowledge can be selected to replace the regional symbols. Such as using the sun pattern to replace the golden bird

totem to express light or shaking hands with graphics instead of bowing to the performance of etiquette. The designs of composite flowers retain the heart of the flower structure but reduce the number of leaf layers. In order to enhance the vision guidance, we should add visual sequence tips to complex scenes, such as setting up the change point of vision rhythm in the long-scroll picture, forming the natural line of sight channel through the gradual change of color, and supplementing the character relationship connection to the group photographic composition, to avoid confusing the identity of the characters. Finally, the dynamic demonstration transformation should be carried out, the physical cultural relics can be translated into digital display, and the multi-angle automatic rotation function can be set up using the three-dimensional model. These adjustments form a cultural buffer: the original image remains intact as the core layer, the middle layer sets up international symbols, and the outer layer provides interactive guidance tools. The synergy of the three structural layers enables Western audiences to gradually understand the essence of oriental art through familiar vision-logic and achieve effective dissemination while maintaining the authenticity of works.

5 Conclusion

This paper aims to show that a deep understanding of the essence of Tang dynasty art can not be limited to the simple reproduction of traditional patterns. The key is to transform the unique pattern symbols in traditional culture into familiar expressions in the modern context and realize the harmonious integration of classical aesthetics and modern vision habits. To this end, this study proposes using digital technology to develop an interactive display platform of ancient art. Using mobile devices to reproduce the classics of Tang dynasty art, the audience should be able to freely control the point of view for viewing through the integration of "Vision + tactile sense" and sound, light, and electricity, breaking through the static shackles of traditional painting and design, and integrating digital interaction technology, the static vision elements are transformed into vivid dynamic pictures, so that the design works move towards the process of "Dynamic narrative." Through the precise production of interactive programs and the clever use of dynamic special effects, users can intuitively watch the screen, interact with the work in real-time through touch, gesture recognition, and other operations, and unlock different vision presentations.

Funding

2024 Jiangsu Province brand professional visual communication design [Su Jiao Gao Han (2024) No.11]; 2023 Jiangsu province colleges and universities "Qing Lan Project" outstanding youth backbone research project results [Su teachers letter (2023)27].

About the Author

Shiqiu Gu, master, professor, senior artist and craftsman, research direction: visual media design, art education.

References

- [1] Yingchen Wu, Hong Yang. The contemporary translation of the cultural characteristics of Yueping's ancient stage from the horizon of AIGC [J]. Packaging engineering, 2025, 46, (4): 362-371.
- [2] Jun Xu, Shunhua Luo. Painting of Court Ladies Adorning Their Hair with Flowers Costume Restoration Series [J]. Silk, 2025, 62, (2): 132.
- [3] Chuanguo Fan, Ningyuan Li. The logical mechanism and application path of AIGC driving the high-quality development of the cultural industry [J]. Hundred Schools in Arts, 2024, 40, (5): 47-53.
- [4] Zhiwei Huang, Yajie Shi, Feng Lu, et al. . Digital restoration of ladies' costumes in Palace Music Entertainment [J]. Journal of Textile Research, 2024, 45(6): 155-164.
- [5] Xinru Ji, Xuedan Wang. Tang Dynasty's Lady Figurines IP cultural creativity design [J]. Packaging engineering, 2024, 45(4): 460.