



The Application of Traditional Chinese Cultural Elements in 3D Digital Animation Visual Designs

Yunqian Yu*

Savannah College of Art and Design, Savannah, GA 31401, USA

*Corresponding author. Email:kandayy1@163.com

Abstract. With the rapid development of digital technology, 3D digital animation has become an important carrier for cultural dissemination. This paper systematically studies the current status, methods, and strategies of applying traditional Chinese cultural elements in the design of 3D digital animation characters and scenes. Through case analysis, element induction, and practical summaries, it explores the innovative transformation paths of traditional cultural elements in digital media. The research findings indicate that the rational use of traditional cultural elements can not only enhance the cultural recognition and artistic value of animation works but also promote the modern expression and global dissemination of China's excellent traditional culture.

Keywords: 3D digital animation characters; scene design; China traditional cultural elements

1 Introduction

Against the backdrop of global cultural integration, the digital animation industry has flourished, becoming an important manifestation of a nation's cultural soft power. After experiencing the glory of its "golden age," Chinese animation once faced the challenge of being impacted by Western animation. In recent years, with the emergence of outstanding works such as "The Return of the Monkey King," "White Snake: Origin," and "Ne Zha: The Demon Child Comes into the World," Chinese animation has rediscovered ways to express cultural confidence. The success of these works is largely attributed to the creative transformation and innovative development of traditional Chinese cultural elements[1].

Integrating traditional Chinese cultural elements into 3D digital animation design is not only a treasure trove of artistic resources but also a contemporary requirement for cultural inheritance. On one hand, traditional cultural elements provide animation creation with rich visual symbols, story materials, and aesthetic concepts; on the other hand, 3D digital technology offers new ways to express traditional culture, making it more in line with contemporary aesthetic demands, especially the reception habits of young audiences. This paper adopts case analysis, comparative research, and inductive

summarization methods to systematically analyze the application strategies of traditional cultural elements in 3D digital animation from two dimensions: character design and scene design. The full text is divided into five parts: Introduction, Traditional Cultural Elements Resource Library, Applications in Character Design, Applications in Scene Design, and Innovative Strategies and Challenges[2-3].

2 Chinese Traditional Cultural Elements Resource Library

Chinese traditional culture is profound and extensive, providing abundant materials for 3D digital animation design. These cultural elements can be divided into multiple categories, each containing unique visual symbols and cultural connotations, as shown in Table 1. (Divided specifically from visual elements to cultural concepts)

Table 1. Classification and examples of Chinese traditional cultural elements

Category	Subcategory	Representative elements	Cultural connotation	Applicable animation types
Visual symbols	Traditional pattern	Cloud pattern, thunder pattern, palindrome pattern, Taotie pattern, dragon and phoenix pattern	Blessing, auspiciousness and hierarchical order	Myth, history, fantasy
	Clothing Han clothing	Tang costume, cheongsam, armor	Etiquette system and characteristics of the times	History, fantasy
	Traditional pattern	Tai Chi, eight diagrams, auspicious patterns	Cosmology, philosophy	Fantasy, martial arts
Cultural concept	Philosophical thought	Confucian benevolence and propriety, Taoist nature, Buddhist causality	Values, world outlook	Philosophy, fantasy
	Aesthetic principles	Artistic conception, blank space and vivid charm	Artistic expression method	Various themes
	Narrative motif	Myths and legends, historical allusions, folk tales	Cultural memory and moral education	Myth, history

3 Application of Traditional Cultural Elements in 3D Animation Character Design

3.1 Character Design

(1) Digital Reproduction and Innovation of Costume Elements

Traditional costumes serve as a vital visual language for defining character identities, historical contexts, and cultural attributes. In 3D animation, costume design must not only faithfully recreate historical features but also balance dynamic simulation feasibility with visual aesthetics[4-5]. Take Xiaobai from "White Snake: Origin" as an example: her costume design blends the fluidity of Tang Dynasty attire with the refined elegance of Song Dynasty garments, while employing digital gauze textures to enhance the character's ethereal charm and spiritual vitality. 3D technology enables precise simulation of fabric properties (such as silk, linen, and armor), including light reflection, dynamic folds, and intricate textures—capabilities unattainable in traditional 2D animation[5].

(2) Traditional Aesthetic Manifestations of Facial Features and Makeup

Table 2. Innovative application cases of traditional cultural elements in 3D animation character design

Animation works	Role	Traditional element sources	Innovative transformation mode	Design effect
Return of the great sage	Sunwu-kong	Peking Opera facial makeup, traditional armor	Simplified patterns, enhanced texture, dynamic Cape design	It not only maintains the traditional recognition, but also conforms to the modern three-dimensional Aesthetics
"Wind mantra"	Lang Ming	Martial arts costumes, blind characteristics	Combine the traditional chivalrous costumes with the characteristics of the blind to enhance the tactile performance	Both role uniqueness and cultural identity
Jiang Ziya	Jiang Ziya	Taoist costumes, middle-aged image	Break the perfect image of immortals and create a sense of vicissitudes with stubble and wrinkles	Deepen the human dimension of the role and enhance the empathy of the audience

China's traditional physiognomy and makeup culture provide a unique perspective for character design. For example, the image of Nezha in "Ne Zha: The Demon Child Comes into the World" breaks away from the traditional "child" appearance, incorporating modern elements such as smoky makeup and exaggerated expressions, while retaining iconic symbols of the traditional Nezha like the bun hairstyle and the Heaven-Mixing Silk, creating a collision of aesthetics between tradition and modernity. The innovative application of traditional cultural elements in 3D animation character design is shown in Table 2.

3.2 Role Action and Performance Design

(1) Digital Transformation of Traditional Opera Postures

The stylized movements in Chinese opera—such as water sleeves, stage steps, and body postures—embodiment a unique rhythm and imagery. In 3D animation, these movements can be brought to life through motion capture technology combined with keyframe animation. In **The Monkey King Returns**, Sun Wukong's combat sequences draw inspiration from the martial role performances in traditional opera. By leveraging 3D technology to exaggerate and transform these movements, along with camera techniques to amplify their impact, the film creates a visually striking experience that blends tradition with innovation[6-7].

(2)The Innovation of Action Language in Wuxia Culture

The lightness skills, swordsmanship, and martial arts in China's wuxia culture provide rich resources for animation action design. Unlike live-action films and television, 3D animation can break through physical limitations, achieving more exaggerated and imaginative action designs. The spell casting actions in "The Legend of the Mortal" blend traditional Taoist hand seals with modern special effects technology, creating a unique "Eastern fantasy" visual language.

3.3 Cultural Expression of the Spiritual Connotation of the Role

(1) Modern Expression of Traditional Ethical Concepts

Character creation lies not only in external appearance but also in spiritual core. Many successful China 3D animated characters embody the modern expression of traditional values. For instance, the rebellious spirit of "My fate is determined by me, not heaven" in *Ne Zha: The Demon Child's Arrival* originates from Taoist contemplation of individual destiny while resonating with the awakening of self-awareness among contemporary youth[8].

(2) Modern Reconstruction of Mythological Prototype

Traditional Chinese mythological figures such as Sun Wukong, Nezha, and Bai Suzhen have become cultural archetypes. In 3D animation, these archetypes are endowed with new psychological depth and contemporary characteristics. "New Gods: Nezha Reborn" sets the story of Nezha in a near-future urban setting, exploring contemporary issues of identity and class rigidity, serving as a creative transformation example of traditional cultural IPs.

4 Application of Traditional Cultural Elements into 3D Animation visuals

4.1 Traditional Culture Philosophy of Space Construction

(1) Feng Shui Concepts and Spatial Layout

China's traditional architecture and garden layout are deeply influenced by feng shui philosophy, emphasizing "harmony between heaven and humanity" and "concealing wind and gathering qi". In 3D scene design, this concept can be transformed into a unique spatial narrative language. The "Divine Enclosure Tower" in "Big Fish & Begonia" is modeled after Fujian Tulou, where the circular enclosed structure not only creates a unique visual spectacle but also symbolizes the theme of family community and a closed world.

(2) Scene Transition and Scattered Perspective

Unlike Western focal perspective, Chinese painting employs scattered perspective and the compositional concept of "a place for wandering and dwelling." In 3D animation, this viewing method can be simulated through camera movement. The scene design in *Jiangnan* draws inspiration from the scattered perspective of the Qing Dynasty painting *Gusu Fanhua Tu* (Prosperous Scenes of Gusu), using a single-take technique to guide viewers through the water town's streets. Table 3 details the specific strategies for incorporating traditional cultural elements into 3D animation scene design.

Table 3. Application strategies of traditional cultural elements in 3D animation scene design

Scene type	Traditional elements	Technology implementation mode	Artistic effect	Representative works
Natural landscape	Artistic conception of landscape painting	Volume fog, atmospheric scattering, ink style shaders	Create a "feasible, promising, tourable and livable" artistic conception space	Five elements in the mist mountain
Architectural scenes	Traditional building structure	Parametric modeling and programmed generation	Reappearance of structural aesthetics such as Dougong, cornice, mortise and tenon	The monster in the Forbidden City
Fantasy space	Mythical cosmology	Particle system, fluid simulation, dynamic lighting	Creating surreal space based on traditional mythological imagination	Deep sea

4.2 Traditional Aesthetic Expression of Material and Light

(1) Digital Simulation of Traditional Materials

Materials in China's traditional culture, such as celadon, silk, Xuan paper, and wood, possess unique textures and aesthetics. In 3D scenes, the reflection, refraction, and diffuse reflection properties of these materials can be accurately simulated using PBR (Physically Based Rendering) technology. The paper-like texture rendering used in "Yearning" makes the entire scene resemble a flowing ink painting, creating a unique Eastern aesthetic experience.

(2) Artistic Treatment of Light and Shadow

China traditional painting does not pursue realistic light and shadow, but emphasizes the expression of "vibrant and dynamic" artistic conception. In 3D scenes, this aesthetic pursuit can be achieved through non-realistic rendering (NPR) technology. The light and shadow design of the "Baoqingfang" scene in "White Snake: Origin" draws inspiration from the light and shadow effects of shadow puppetry and paper-cutting art, creating a mysterious and oriental atmosphere.

4.3 The manifestation of Cultural Elements in Scene Narration

(1) The Metaphorical Function of Cultural Symbols

The cultural symbols in the scene, such as objects, patterns, and colors, can serve as metaphors to hint at the characters' personalities, fates, or thematic ideas. In "Jiang Ziya," the design of Youdu Mountain integrates the patterns of Shang and Zhou bronze artifacts with the desolate landscape features, not only conveying a sense of historical weight but also metaphorically reflecting the oppressive order of the Fengshen world.

(2) The Narrative Structure of Interwoven Space and Time

The spatiotemporal concepts in China's traditional culture are characterized by cyclicity and interweaving, which differ from the linear time perception in the West. In 3D animation scene design, this concept can be embodied through techniques such as spatial juxtaposition and temporal overlap. Although "Time Agent" is not a purely Chinese-style work, its scene design integrates traditional and modern elements of spatiotemporal interweaving, reflecting China's unique spatiotemporal philosophy.

5 Innovation Strategy and Development Challenges

5.1 Innovative Transformation Strategies for Traditional Cultural Elements

(1) Deconstruction and Reconstruction Strategies

Deconstruction and reconstruction constitute the foundational methodology for innovation transformation, emphasizing the "genetic-level" disassembly and reassembly of traditional cultural elements. This strategy comprises three tiers:

Symbolic Deconstruction and Reassembly: Extracting traditional visual elements (patterns, colors, forms) from their historical contexts to decompose them into fundamental morphological units. For instance, transforming traditional dougong brackets into abstract spatial components, converting bronze vessel motifs into armor decorative languages, or converting calligraphic brushstrokes into motion trajectories for special

effects. In "Big Fish & Begonia," the circular architecture of Fujian Tulou is deconstructed into imagery of "enclosure" and "protection," reassembled as symbolic spaces embodying ethnic memory and cyclical destiny.

Contextual Reshaping in Narrative: By situating traditional story archetypes and character archetypes within contemporary settings, this approach sparks a dialogue between ancient wisdom and modern values. **Ne Zha: The Demon Child** reimagines the classic tragedy of 'bone-grabbing and returning to the father' as a modern coming-of-age tale exploring identity and prejudice. **White Snake: Origin** frames the love legend within a prequel-style fantasy adventure, adding psychological depth to traditional characters.

Modern spiritual expression: By delving into the core values of traditional culture—such as "harmony between heaven and humanity," "benevolence toward others," and "following the natural way"—and transforming them into relatable emotional themes and contemporary values for modern audiences. Through exploring the moral dilemma of "individual versus the masses," **Jiang Ziya** reinterprets the traditional scholar's ethos of "benefiting all under heaven" as a modern reflection on absolute justice.

(2) Strategies for Digital Language Transformation

The innovative transformation of traditional culture in 3D animation often achieves new creative syntheses by transcending the boundaries of media and culture. The aesthetic characteristics of traditional art forms are converted into 3D digital language. For example, the "blending" and "negative space" of ink wash painting are transformed into non-realistic rendering techniques based on particle systems and fluid simulation; the planarized and silhouette-like modeling of shadow puppetry is converted into low-polygon style 3D models; the stylized movements of opera are combined with motion capture data and keyframe animation to form a unique performance style. "Wushan Wuxing" integrates the traditional ink wash aesthetic with intense combat, creating a unique visual rhythm that is "as swift as a startled swan, as serene as ink wash." While maintaining the cultural subjectivity of China, it selectively absorbs narrative structures, world-building, or visual techniques from Western animation, forming an innovative expression that blends Chinese and Western elements. For example, it combines the "reincarnation concept" of Chinese traditional mythology with the narrative framework of Hollywood hero journeys; it merges the Eastern "aesthetic of artistic conception" with the Western "immersive" scene design principles. "Deep Sea" attempts to combine traditional Chinese colors with particle ink wash technology, creating a visual spectacle that is both ethnically rooted and internationally recognizable.

(3) Digital and Interactive Living Heritage Strategies

The interactive nature of digital technology has revolutionized traditional culture, transforming static displays into dynamic experiences. By converting traditional aesthetic principles (such as symmetry, repetition, and gradation) into adjustable parameter systems through algorithms, we enable infinite variations and dynamic generation of cultural elements. For instance, algorithms based on traditional window lattice patterns create architectural decorations, while AI-generated mythical creature designs inspired by the **Classic of Mountains and Seas** provide endless creative inspiration. Technologies like VR/AR and real-time rendering engines transform audiences from passive observers into active participants. In interactive animations, users can "assemble"

bronze artifact patterns, "construct" mortise-and-tenon structures, or influence artistic compositions through body movements in ink-wash spaces. This "learning by doing" approach facilitates the internalization and dissemination of cultural knowledge through engagement. Establishing systematic digital resource libraries—including high-precision 3D scans of artifacts, traditional color palettes, ethnic costume designs, and architectural component models—provides creators with standardized, customizable materials that lower technical barriers to innovation.

5.2 Challenges and Countermeasures

(1) The Problem of Superficialization of Cultural Connotation

Current animation productions often treat traditional cultural elements as mere symbolic collages, lacking profound cultural comprehension and transformation. To address this, we propose: forming interdisciplinary teams with cultural scholars involved in the creative process; enhancing creators' cultural literacy training; and promoting in-depth field research and literature studies.

(2) The Contradiction between Technical Standard and Aesthetic Style

The technical standards of 3D digital animation mostly originate from the West, which creates inherent tension with China's traditional aesthetics. Countermeasures: Develop 3D rendering pipelines and technical tools suitable for China's aesthetic expression; explore innovative applications of non-realistic rendering techniques in China-style animation; establish a visual language system for China animation.

(3) Balance between Globalization and Localization

In the global market communication, how to avoid cultural barriers while maintaining cultural characteristics is a great challenge. Countermeasures: Find the common human emotional themes as the core of the narrative; adopt the "culture layer" strategy, the surface is the universal story, the deep is the cultural characteristics; strengthen the cultural discourse power in international cooperation.

6 Conclusion

In the era of booming 3D digital animation, the application of China's traditional cultural elements in character and scene design shines like a brilliant star, illuminating the unique path of animation creation and infusing this modern art form with profound cultural heritage and strong vitality.

Firstly, from the perspective of cultural inheritance, this application represents a heartfelt reflection and continuous transmission of the Chinese nation's long-standing history. With its powerful dissemination and influence, 3D digital animation vividly presents traditional cultural elements to the public in a lively and dynamic manner. Whether it's the exquisite traditional patterns on animated characters' costumes or the antique architectural styles in the scenes, audiences are subtly immersed in the charm of traditional culture while enjoying the animations. This process fosters a sense of identity and pride in national culture, ensuring its continuation and promotion in the new era.

Secondly, from the perspective of artistic innovation, traditional cultural elements provide an inexhaustible source of inspiration for 3D digital animation. Designers skillfully blend traditional elements with modern digital technology to create animated characters and fantastical scenes that possess both Eastern charm and contemporary aesthetics. This innovation not only enriches the artistic expression of animation but also promotes the diversified development of animation art, making China's 3D digital animation stand out uniquely in the global animation landscape.

Thirdly, in terms of commercial value, 3D digital animations incorporating elements of China's traditional culture have broad market prospects. With the continuous upgrading of the domestic cultural consumption market and the increasing international attention to China's culture, such animations with unique cultural identifiers are more likely to win the favor of audiences, achieve commercial success, and thereby promote the prosperity and development of the animation industry.

In the future, we look forward to more outstanding 3D digital animation works delving into the traditional cultural elements of China, using innovation as the brush and culture as the ink to create even more vibrant and colorful animation paintings, allowing the traditional culture of China to shine with even greater brilliance in the digital era.

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