

Text-to-Visual Transduction Empowering the Practical Pathways of Guochao Doll Design

Fang Huang¹, Haolong Wang^{1*}

¹ College of Fashion Technology, Zhongyuan University of Technology, Zhengzhou, China

*Correspondence: Haolong Wang

Received: 22 June 2026; **Accepted:** 8 July 2026; **Published:** 9 August 2026

Abstract:

The rise of Guochao dolls reflects younger generations' aspiration for cultural identification and heritage reconstruction. However, contemporary design practices largely remain at superficial symbol collage, plagued by cultural core dilution, design language homogenization, and national expression labeling. Text-to-visual transduction, as a systematic methodology from cultural texts to visual symbols, provides a comprehensive framework for Guochao doll design. This paper defines the concept and its extraction-induction-transformation pathway, demonstrates its three-dimensional value-cultural depth, design breadth, and national height-and proposes three practical pathways: establishing a character universe through narrative threads, intensifying visual differentiation through plot conflicts, and integrating reality-fantasy narration to expand virtual-physical symbiosis. Using ancient texts and the mythical creature Yeniao as examples, the study explicates the transduction logic from text to doll, providing a methodological reference for the creative transformation and innovative development of Guochao dolls.

Keywords:

Text-to-visual Transduction, Guochao Dolls, Design Practice, Cultural Transduction, Virtual-Physical Symbiosis

1. Introduction

Driven by cultural confidence and consumption upgrading, Guochao has evolved into a socio-cultural movement with designer toys as its most penetrating material carrier [1]. However, the Guochao doll market suffers from homogenization: many products equate Chinese style with mechanical stacking of elements like dragons and auspicious clouds, reducing dolls to fast-moving consumer goods devoid of narrative depth. The root cause lies in the absence of a systematic methodology for transforming cultural texts into visual language.

Text-to-visual transduction emphasizes creative transformation and narrative reconstruction between different semiotic systems rather than mechanical translation. This methodology treats cultural texts as resource repositories that can be deeply decoded, systematically inducted, and creatively transformed, enabling dolls to become narrative living entities.

2. Theoretical Connotations and Value Space

2.1. Conceptual Definition

Text-to-visual transduction is a transductive act at the visual level based on textual information, whose sources encompass cultural achievements recorded through language. The English equivalent is transduction rather than translation: translation pursues meaning equivalence within the same semiotic system, while transduction emphasizes conversion between different systems-e.g., from textual to visual symbols. Since language and image are fundamentally distinct, this conversion is not mechanical but emphasizes creative transformation and narrative reconstruction.

The text-visual relationship is deeply symbiotic. First, text provides foundation and depth; classical masterpieces serve as the cultural anchor, providing core narrative frameworks and character archetypes [2]. The aesthetic traditions embedded in these texts have shaped Chinese visual culture for millennia [3], and the animation of Shanhaijing elements exemplifies this lineage [4]. Second, visual transduction endows text with form and new life; since the human brain predominantly processes visual images, visual transduction reduces accessibility thresholds and expands dissemination. Third, from text-image complementarity to cross-medial hypertext narration: on modern carriers combined with AR, this relationship evolves further.

2.2. Value Space

Digital humanities paradigms have opened new value space, enabling fuzzy imagery to become clearly visualizable. Research on the Classic of Mountains and Seas achieved a leap from textual records to scene immersion [5]. Digital humanities research continues to expand its methodological frontiers [6]. Digital humanities research reconstructs the value creation pathway and establishes design practice on a more scientific foundation. Globally, text-to-visual transduction serves as an efficient cross-cultural medium, bypassing linguistic linearity to appeal to universal visual perception and integrating Chinese cultural symbols into globally shared visual languages .

2.3. Basic Pathway: Extraction-Induction-Transformation

The pathway progresses from decoding to re-encoding through three stages. First, textual information extraction involves deep decoding through macro-reading (grasping genre, background, aesthetic style) and micro-reading (extracting keywords, imagery, material metaphors), aided by text mining. Second, textual information induction classifies fragments into a structured cultural factor repository according to design dimensions, forming networked information structures. Third, textual information transformation converts inducted information into visual images through creative design thinking and visual rhetoric strategies, achieving the leap from textual to visual semantics. This methodology aligns with broader efforts toward the creative transformation of traditional culture through interaction design [7].

3. Value Dimensions Empowering Guochao Doll Design

Guochao dolls are the product of the deep integration of Guochao culture and the designer toy industry [1].

3.1. Cultural Depth: Anchoring Narrative Foundations

The primary empowerment anchors design sources within cultural texts-classical masterpieces that are gene banks of national spirit. Transduction transforms random browsing into targeted prospecting, employing word frequency analysis and knowledge graphs for structured mining [8]. From the perspective of art design theory, this systematic approach ensures that cultural elements are not merely decorative but structurally integrated [9]. The complete narrative frameworks of classical texts provide solid narrative endorsement-each doll character becomes a narrative node growing from a deep textual network.

3.2. Design Breadth: Expanding Inspiration Space

This empowerment transforms static texts into dynamic inspiration sources. The first direction moves from explicit narrative to implicit information-prospecting environmental atmosphere, color imagery, and material metaphors beyond the main plot. The second upgrades from element stacking to grammar generation-reorganizing fragments into design grammar, e.g., inducting crimson, flame, and golden eyes into the visual grammar of fierce rebellion, consistent with semiotic approaches to cultural product design [10].

3.3. National Height: Internalizing Cultural Genes

The most profound empowerment extracts collective national consciousness from cultural texts, enabling products to reach spiritual Chinese identity. Transduction penetrates to deep cultural archetypes [11], distills cross-textual cultural gene maps, and seeks resonance between national and contemporary spirit-Chinese cultural symbols follow a plurality in unity orientation [12], e.g., converting the perseverance of Jingwei filling the sea into the enterprising spirit of contemporary youth.

4. Practical Pathways

4.1. Establishing a Character Universe Through Narrative Threads

This pathway constructs a logically self-consistent, extensible character universe based on narrative threads. The cornerstone lies in deep narrative deconstruction-identifying key characters and mapping their associations (blood relations, mentorship, enmity, alliances [13]). The core empowerment is providing cultural endorsement and narrative rationality; the relationship network provides each character with behavioral logic, preventing hollow symbol stacking. Emerging AI-assisted methodologies further enhance IP image design efficiency in the cultural and creative industry [14]. Table 1 illustrates the character universe of the Yeniao.

Table 1. Character universe relationship network of the Yeniao.

Character	Textual Basis	Relational Position	Visual Transduction Direction
Yeniao	Records of Diverse Matters: “Shaped like a dove, sometimes observing human joy and sorrow”	Universe core / Commander	Dove-shaped anthropomorphic, interchangeable expression accessories
Stone Crab	“Taking stone crabs and roasting them at human fires”	Prey / Scene prop	Miniature crab accessory, fire-roasting dynamic freeze-frame
Tiger	“If there is filth or violation of its territory, tigers will guard throughout the night”	Guardian / Responder	Tiger-stripe phantom element, night-guard posture

4.2. Intensifying Visual Differentiation Through Plot Conflicts

Plot conflict is the wellspring of narrative tension and the focal point for visual differentiation. The first aspect encodes narrative contradictions into visual language—through contrasting modeling languages (rigid vs. flowing), antagonistic color systems (azure-blue vs. flame-red), and aggressive action design—freezing conflict on static dolls. The second aspect captures the moments of greatest dramatic tension as static freeze-frames. For Sun Wukong, freeze-framing breaking out of the Eight-Trigrams Furnace condenses core abilities and heroic personality with greater visual impact. Table 2 presents the visual differentiation encoding.

Table 2. Visual differentiation encoding of plot conflicts.

Design Dimension	Order Side (e.g., Ao Bing)	Rebellion Side (e.g., Ne Zha)	Differential Rhetoric
Modeling Language	Rigid, angular, symmetrical	Untamed, flowing, asymmetrical	Geometric vs. Organic
Color System	Somber azure-blue	Fierce flame-red	Cold vs. Warm collision
Dynamic Freeze-frame	Composed, restrained, ritualized	Defiant, breakthrough, expansive	Static vs. Dynamic tension

4.3. Integrating Reality-Fantasy Narration to Expand Virtual-Physical Symbiosis

Narrative content divides into reality narration (conforming to physical laws) and fantasy narration (exceeding them). Fantasy content can be visually expressed through virtual carriers, expanding virtual-physical interactive modalities and breaking through static doll limitations. Physical dolls carry the stable, verifiable reality portions, while fantasy elements gain dynamic expression through digital technology. Taking the Yeniao as an example, AR scanning the physical doll triggers a digital animation with a virtual Yeniao and tiger phantom [15], elevating the doll from static craft to interactive portal. Table 3 illustrates the virtual-physical division of labor.

Table 3. Virtual-physical division of labor for the Yeniao reality-fantasy narration.

Narrative Type	Carrier	Experience Mode
Reality narration (dove form, stone crab, fire-roasting)	Physical carrier (doll entity + accessories)	Tactile, static, verifiable
Fantasy narration (commanding tigers, duo-duo calls)	Virtual carrier (AR animation + sound effects)	Dynamic, immersive, interactive
Virtual-physical symbiosis (fantasy realm + physical object)	Physical as portal, virtual as space	Scan-triggered hypertext narration

5. Conclusions

The true vitality of Guochao dolls lies not in abundant symbol stacking but in deep cultural gene internalization. Text-to-visual transduction constructs a complete channel from cultural texts to visual entities through its extraction-induction-transformation methodology: anchoring narrative foundations with cultural depth, expanding inspiration with design breadth, and internalizing spiritual genes with national height; consolidating narrative endorsement through character universe construction, crystallizing dramatic tension through visual differentiation, and breaking static boundaries through virtual-physical symbiosis. The three pathways progressively address core demands in IP system, visual expression, and experiential dimensions. Text-to-visual transduction is an open mode of thinking, enabling dolls to

evolve from fast-moving consumer symbols into narrative living entities carrying national memory and contemporary emotions.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

References

- [1] Zhu, S. Design reflections on Guochao. *Zhuangshi*, 2020, 7, 12-17.
- [2] Rao, S.; Li, G. The Rise of Chinese Animation: Cultural reconstruction and industrial upgrading. *Contemp. Cinema*, 2019, 10, 4-11.
- [3] Li, Z. *The Path of Beauty*; SDX Joint Publishing Company: Beijing, China, 2009; pp. 30-35.
- [4] Deng, Y. Analysis of Shanhaijing elements in ancient Chinese mythological animated films. *Highlights Art Des.* 2023, 4, 170-173.
- [5] Wang, X.; Li, N. Construction and visualization of knowledge graph of Shanhaijing from the perspective of digital humanities. *Libr. Inf. Serv.* 2021, 65, 90-99.
- [6] Liu, W.; Ye, Y. Current status and future prospects of digital humanities research. *J. Libr. Sci. China*, 2017, 43, 22-33.
- [7] Yuan, W.; Yi, J.; Liu, Y. Research on creative transformation of excellent traditional Chinese culture: Taking interaction design of traditional handicraft culture translation as an example. In *Electronic Workshops in Computing*; Springer: Cham, Switzerland, 2022.
- [8] Chen, Y.; Chen, C.; Liu, Z.; et al. CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. *J. China Soc. Sci. Tech. Inf.* 2009, 28, 401-421.
- [9] Li, Y. *Introduction to Art Design*; Hubei Fine Arts Publishing House: Wuhan, China, 2009; pp. 156-158.
- [10] Chen, J. Application research on cultural tourism product design based on semiotics threshold. *World J. Soc. Sci. Res.* 2024, 11, 45-52.
- [11] Fei, X. *Culture and Cultural Self-Awareness*; Qunyan Press: Beijing, China, 2010; pp. 88-92.
- [12] Hao, Y. Symbolic construction and identification mechanism of Chinese national community consciousness. *Natl. Res.* 2021, 4, 28-39.
- [13] Li, J. Multi-dimensional narrative structure of character relationship network in *Journey to the West*. *J. Ming Qing Novel Res.* 2018, 3, 145-157.

- [14]Li, Y.; Zhu, J. Enhancing the tourism cultural and creative industry: A novel AIGC-integrated methodology for efficient IP image design. *Des. J.* 2026, 29, 1-18.
- [15]Huang, X.; Xu, J. Immersive narrative of cultural heritage empowered by AR technology. *Zhuangshi*, 2022, 6, 110-113.



© 2026 by the author(s); licensee International Technology and Science Publications (ITS), this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (<http://creativecommons.org/licenses/by/4.0/>)