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A Study on the Reconstruction of Shadow Puppet Costume Patterns Based on the Cultural Genes of Cantonese Embroidery

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Abstract

Cantonese embroidery, an important form of traditional Chinese embroidery, is characterized by distinctive Lingnan cultural features. Its floral, bird, animal, and auspicious motifs, together with its stitching techniques, colors, and compositions, reflect rich historical and cultural meanings. Shadow puppetry combines carving, painting, performance, and folk traditions, with costume patterns serving as visual expressions of character identity and cultural symbolism. However, differences in materials, structures, and visual presentation make the transformation of embroidery patterns into shadow puppet carving elements a challenging task in cross-media design. Based on the concept of cultural genes, this study employs literature review, image analysis, morphological comparison, and design translation to develop a framework for pattern reconstruction. First, Cantonese embroidery's cultural genes are extracted from four dimensions: thematic symbolism, morphological structure, color, and stitching texture. Second, these features are mapped onto shadow puppet costumes, considering their structural characteristics, hollow-carving techniques, and light-and-shadow effects. Finally, pattern simplification, structural adaptation, decorative recombination, and color transformation are applied to reconstruct costume patterns. This study explores the visual connections between Cantonese embroidery and shadow puppetry, providing methodological references for cross-media design, digital preservation, and the innovative application of traditional Lingnan arts and crafts.

Keywords

Cantonese embroidery, cultural genes, shadow puppetry, character costumes, pattern reconstruction, intangible cultural heritage

1. Introduction

1.1 Research Background

Traditional Chinese arts and crafts constitute an important component of China's cultural heritage. Through long-term development, traditional handicrafts across different regions have developed distinctive artistic languages that reflect their local cultural identities. Cantonese embroidery, a representative traditional embroidery craft of the Lingnan region, is one of the four major Chinese embroidery styles and, together with Chaozhou embroidery, constitutes Yue embroidery. Primarily practiced in Guangzhou and its surrounding areas, Cantonese embroidery has a long history and encompasses a wide range of subjects, including flowers,

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birds, human figures, auspicious animals, and plants characteristic of the Lingnan region. Over time, it has developed distinctive artistic features, including elaborate compositions, rich colors, vivid imagery, and strong decorative qualities. In 2006, Cantonese embroidery was included in the first batch of China's National Representative List of Intangible Cultural Heritage [1–6].

Beyond its distinctive materials and techniques, Cantonese embroidery embodies the historical memory, folk beliefs, and aesthetic values of the Lingnan region. Motifs such as phoenixes, peacocks, peonies, lychees, and various birds not only represent artistic interpretations of natural subjects but also convey cultural meanings associated with auspiciousness, prosperity, longevity, and fertility through symbolism, homophonic associations, and compositional arrangements [4–6].

Meanwhile, shadow puppetry is an important form of traditional Chinese folk performing art that integrates visual arts, carving techniques, color decoration, and theatrical performance. Shadow puppet figures are typically made from leather or paper-based materials and shaped through carving, coloring, and joint assembly to create movable figures. When illuminated, these figures produce distinctive visual effects through projected light and shadow. Costume patterns constitute an essential component of shadow puppet character design. They not only enrich the visual appearance of characters but also communicate their identities, personalities, and narrative backgrounds [7–10].

From an artistic perspective, Cantonese embroidery and shadow puppetry share certain foundations for visual integration. Cantonese embroidery creates representations through stitching techniques, lines, colors, and textures, whereas shadow puppetry relies on carved lines, openwork structures, color application, and variations in light and shadow. Although the two art forms differ in materials, production techniques, and modes of visual expression, they share common characteristics in traditional auspicious motifs, decorative compositions, and folk symbolism. Therefore, transforming Cantonese embroidery patterns into decorative elements for shadow puppet costumes can not only expand the contemporary applications of traditional embroidery but also provide new visual resources for the innovative design of shadow puppet characters [11].

1.2 Research Questions and Significance

Existing innovative design practices involving traditional arts and crafts often emphasize the direct extraction and reuse of traditional patterns, applying original motifs to new design media through scaling, rearrangement, or color adjustment. Although this approach can preserve certain traditional decorative features, it may overlook the structural differences between distinct craft media. In particular, Cantonese embroidery features intricate stitching layers, thread textures, and color transitions, whereas shadow puppet costumes must accommodate hollow carving, structural connections, light transmission, and dynamic manipulation. Consequently, the direct transfer of embroidery patterns may not adequately meet the technical and structural requirements of shadow puppet production [11].

Against this background, this study addresses three research questions. First, how can representative cultural genes be extracted from traditional Cantonese embroidery patterns and organized into a classification system suitable for design translation? Second, how can the morphological, chromatic, and stitching characteristics of Cantonese embroidery be transformed into a visual language compatible with shadow puppet carving techniques? Third, how can pattern recombination and structural adaptation be employed to develop shadow puppet costume patterns that retain the cultural characteristics of Cantonese embroidery while enhancing the visual expressiveness of shadow puppetry?

The significance of this study can be considered from three perspectives. Theoretically, it establishes connections between the cultural genes of Cantonese embroidery and shadow puppet costume design, thereby expanding research perspectives on the cross-media translation of traditional embroidery. From a design perspective, it transforms Cantonese embroidery motifs into decorative patterns compatible with shadow puppet production techniques, providing new design approaches for traditional shadow puppet costumes. In terms of cultural preservation, the extraction, deconstruction, and reconstruction of traditional motifs facilitate the collaborative dissemination and innovative development of Lingnan embroidery culture and traditional shadow puppetry.

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1.3 Research Methods and Technical Framework

This study employs four principal research methods:

(1) **Literature Review:** Relevant publications on Cantonese embroidery, traditional shadow puppetry, folk decorative patterns, and innovative intangible cultural heritage design are collected and reviewed to examine the historical development and artistic characteristics of Cantonese embroidery, as well as the decorative principles of shadow puppet costumes [3–5, 7–11].

(2) **Image Analysis:** Representative floral, avian, auspicious animal, and botanical motifs from Cantonese embroidery are selected for visual analysis, focusing on their contours, structures, compositions, color schemes, and local details.

(3) **Morphological Comparison:** Cantonese embroidery patterns are compared with shadow puppet costume motifs to identify similarities and differences in pattern organization, line composition, spatial arrangement, and decorative expression.

(4) **Design Translation:** Pattern extraction, morphological simplification, structural recombination, and conversion into carving-based visual elements are employed to explore the application of Cantonese embroidery motifs in shadow puppet costume design.

Overall, the study follows a systematic technical framework comprising five stages: cultural gene extraction, visual feature deconstruction, artistic language translation, costume pattern reconstruction, and design application.

2. Cultural Genes of Cantonese Embroidery and the Decorative Language of Shadow Puppet Costumes

2.1 The Concept of Cultural Genes in Cantonese Embroidery

Cultural genes refer to relatively stable and recognizable cultural characteristics and expressive elements developed through the long-term transmission of traditional culture. In the study of traditional arts and crafts, cultural genes encompass not only specific visual symbols but also the cultural meanings, aesthetic values, craftsmanship, and regional cultural information underlying decorative patterns [1, 11].

In the context of Cantonese embroidery, cultural genes can be understood as visual and cultural information comprising thematic symbols, morphological structures, color characteristics, and craftsmanship features. These elements reflect the regional aesthetic characteristics of Cantonese embroidery and provide identifiable, extractable, and transferable resources for cross-media design. This study categorizes the cultural genes of Cantonese embroidery into four dimensions: thematic cultural genes, including floral, avian, auspicious animal, botanical, and symbolic motifs; morphological and structural genes, encompassing object contours, proportions, dynamic features, compositional arrangements, and pattern combinations; color-related cultural genes, including dominant colors, complementary colors, contrasting colors, and overall color relationships; and craftsmanship-related genes, involving stitching arrangements, thread directions, textural layers, and material expression [3–6].

2.1.1 Typical Motifs and Their Cultural Meanings in Cantonese Embroidery

Traditional Cantonese embroidery features a rich variety of decorative motifs, which differ in their morphological characteristics and cultural meanings. Based on its traditional decorative themes and artistic expressions, this study classifies the motifs suitable for adaptation to shadow puppet costumes into the following categories [4, 6].

(1) **Floral and Botanical Motifs.** Floral and botanical patterns are among the most representative decorative themes in Cantonese embroidery. Common examples include peonies, lotus flowers, plum blossoms, chrysanthemums, lychees, and other plants characteristic of the Lingnan region. These motifs generally feature distinctive natural forms, with petals, branches, leaves, and fruits forming diverse compositional relationships. Peonies are commonly associated with wealth and prosperity, lotus flowers evoke elegance and purity, and plum blossoms symbolize resilience and nobility. In shadow puppet costume design, floral motifs can be incorporated into collars, cuffs, skirt hems, and decorative borders [4–6].

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(2) **Avian Motifs.** Phoenixes, peacocks, cranes, and other birds are important subjects in traditional Cantonese embroidery. These motifs possess strong dynamic qualities, with feathers, wings, tail plumage, and body contours forming intricate decorative structures. Phoenixes traditionally symbolize auspiciousness and nobility, while peacocks are associated with elegance, splendor, and good fortune. In reconstructing shadow puppet costume patterns, particular attention can be given to the birds' heads, wings, tail feathers, and feather arrangements. Through local simplification and geometric abstraction, these features can be transformed into layered decorative units [4–6].

(3) **Auspicious Animal Motifs.** Dragons, lions, qilin, and other auspicious animals carry strong symbolic meanings and distinctive visual identities. Their forms generally consist of body contours, scales, manes, horns, claws, and tails, often incorporating intricate decorative details. When adapting these motifs to shadow puppet costumes, their essential identifying features should be retained while overly intricate details are simplified to meet the structural and technical requirements of shadow puppet carving [4, 6].

(4) **Combined Auspicious Motifs.** In addition to individual representations, Cantonese embroidery also features auspicious compositions combining multiple motifs, such as floral and bird combinations, auspicious animals paired with plants, and continuous patterns with symbolic meanings. These compositions emphasize the relationships among visual elements and their collective cultural significance, making them suitable for prominent decorative areas of shadow puppet costumes, including the chest, back, and other large surface areas [4, 6].

2.1.2 Morphological, Chromatic, and Craftsmanship Characteristics of Cantonese Embroidery

Cantonese embroidery is characterized by elaborate compositions, vivid imagery, rich colors, and strong decorative qualities. Its diverse stitching techniques allow contours, textures, and spatial layers to be expressed through different threads and stitching arrangements. Its major techniques include silk-thread embroidery, metallic-thread embroidery, thread embroidery, and bead embroidery, with particular emphasis on the interaction between stitching methods and material properties [3–6].

In terms of morphology, Cantonese embroidery emphasizes both the natural forms of represented objects and their decorative interpretation. Elements such as petals, feathers, and branches are typically organized through variations in contours and internal line structures, creating visually rhythmic compositions. In terms of color, Cantonese embroidery emphasizes both contrast and harmony, using different colored threads to convey morphological details, visual depth, and decorative effects.

Craftsmanship is another essential factor in shaping the visual textures of Cantonese embroidery. Different stitching techniques produce variations in line direction, density, and surface texture. For example, filling stitches create relatively continuous color areas, directional stitches reinforce the structural and growth characteristics of represented objects, while metallic-thread embroidery and raised embroidery produce distinctive decorative effects. Although these craftsmanship features cannot be directly reproduced on shadow puppet carving materials, they can be translated into visual elements through carved lines, dot-based structures, variations in openwork density, and layered local decorations.

2.2 Decorative Language and Structural Characteristics of Shadow Puppet Costumes

This chapter examines the relationship between the cultural genes of Cantonese embroidery and the decorative language of shadow puppet costumes. First, the cultural genes of Cantonese embroidery are examined across four dimensions: thematic symbolism, morphological structure, color characteristics, and craftsmanship features, with particular attention to the artistic characteristics and cultural meanings of floral and botanical, avian, auspicious animal, and combined auspicious motifs. Second, the morphological structures, carving techniques, and light-and-shadow characteristics of shadow puppet costumes are investigated. Finally, the similarities and differences between the two art forms in terms of materials, craftsmanship, colors, and decorative language are compared to identify the requirements for adapting Cantonese embroidery patterns to shadow puppet costumes. This analysis establishes a theoretical foundation for subsequent cultural gene extraction, visual translation, and costume pattern reconstruction [7–10].

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2.2.1 Morphological Characteristics of Shadow Puppet Costumes

Shadow puppet costumes are essential components of overall character design. Their visual presentation generally reflects the character's identity, personality, social status, and role within the theatrical narrative. Different character types exhibit variations in costume silhouettes, decorative density, and pattern arrangements [8–10].

Structurally, shadow puppet costumes generally consist of the torso, sleeves, front panels, waist, and lower hems. Each area serves a different decorative function. The chest and back provide suitable spaces for primary motifs, while cuffs and garment hems are appropriate for continuous decorative borders. The waist area can accommodate symmetrical or band-like patterns.

Visually, shadow puppet costumes must accommodate both static appearance and dynamic performance. Patterns should remain clearly recognizable in frontal projection while avoiding interference with joint connections and character movement. Therefore, pattern design must take into account the relationships among costume structures, carving positions, and movable components.

2.2.2 Carving and Light-and-Shadow Characteristics of Shadow Puppet Patterns

Shadow puppetry primarily employs carving, drawing, and coloring techniques to create character representations. Unlike embroidery, which produces surface textures through the arrangement of threads, shadow puppet patterns rely on material translucency, openwork structures, and applied colors to generate visual effects. Their decorative language mainly comprises contour-line expression, openwork techniques, color application, and repetitive and symmetrical arrangements [7–9].

Contour lines define the outlines of costumes and decorative motifs through continuous or varied carved lines, emphasizing overall structural coherence. Openwork techniques create decorative effects through the selective removal of material, combining dots, lines, and planes. Color application enhances visual layering, while repetition and symmetry establish ordered decorative structures through continuous motif arrangements, central symmetry, and localized repetition. Consequently, shadow puppet costume patterns must satisfy not only aesthetic requirements but also practical considerations involving material processing, carving precision, structural connections, and light-and-shadow performance [7–9].

2.2.3 Differences and Connections Between the Decorative Languages of Cantonese Embroidery and Shadow Puppetry

Although Cantonese embroidery and shadow puppetry belong to different traditional art forms, they share certain characteristics in motif themes, compositional organization, and folk symbolism. Meanwhile, they differ significantly in material properties, production techniques, and modes of visual expression. Cantonese embroidery primarily uses silk threads and textiles, employing techniques such as embroidery, thread filling, and padded stitching to create delicate contours, rich color layers, and three-dimensional textures. In contrast, shadow puppetry uses leather or paper-based materials and relies on carving, openwork, and coloring to create character silhouettes, decorative colors, and light-and-shadow effects [3–9].

As shown in Table 1, Cantonese embroidery emphasizes thread-based modeling and material textures, characterized by intricate details, rich decorative elements, and pronounced three-dimensional effects. Shadow puppetry, by comparison, focuses on contour carving and structural organization, emphasizing abstraction, translucency, and structural clarity. Therefore, integrating the two art forms requires more than simply reproducing traditional patterns; it involves an adaptive translation process that considers cultural meanings, morphological structures, and craftsmanship characteristics. The central objective is to preserve the cultural symbolism and visual identity of Cantonese embroidery motifs while transforming their original thread-based textures into carved lines, openwork structures, and color-block compositions suitable for shadow puppet production. This provides a design foundation for the innovative application of the cultural genes of Cantonese embroidery in shadow puppet costume design [3–6, 7–9].

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Table 1: Comparison of Craftsmanship Characteristics and Decorative Languages between Cantonese Embroidery and Shadow Puppetry

Comparative Dimension	Cantonese Embroidery	Shadow Puppetry
Primary Materials	Silk threads, textiles, metallic threads, etc.	Leather or paper-based materials
Main Techniques	Embroidery, thread filling, padded embroidery, etc.	Carving, openwork, and coloring
Modeling Methods	Thread-based modeling and textural expression	Contour carving and light-and-shadow effects
Color Characteristics	Rich color combinations and layered thread textures	Translucent colors and color-block compositions
Decorative Features	Delicate, elaborate, and strongly three-dimensional	Simplified, translucent, and structurally defined
Design Requirements	Emphasis on stitching techniques and material textures	Consideration of openwork, light transmission, and structural connections

2.3 Comparative Analysis of Typical Cases

To strengthen the material basis for pattern translation, this study selects representative cases from museum collections and reports on Cantonese embroidery, shadow puppet craftsmanship, embroidered theatrical costumes, and contemporary cross-media design as comparative references. It should be noted that currently verifiable sources primarily establish the existence of Cantonese embroidery artifacts and shadow puppet craftsmanship as separate categories. However, these sources do not provide sufficient evidence to confirm the historical existence of shadow puppet costumes directly produced using traditional Cantonese embroidery. This study adopts a parallel comparative and design translation approach, avoiding the conflation of different types of cases into a single historical lineage [12–15].

2.3.1 Physical Examples of Cantonese Embroidery: A Late Qing Dynasty Floral and Bird Screen and a Republican-era Embroidered Garment

According to relevant records from the Guangzhou Thirteen Hongs Museum, two representative artifacts of Cantonese embroidery are the late Qing Dynasty floral and bird screen with a rosewood frame inlaid with mother-of-pearl, and the Republican-era red satin Han-style front-opening cloak embroidered with flowers, butterflies, and cranes. These two artifacts demonstrate the artistic characteristics of Cantonese embroidery in terms of motif composition, thematic expression, and decorative arrangement across different material forms. They provide valuable physical references for extracting the cultural genes of Cantonese embroidery and reconstructing shadow puppet costume patterns in this study [12].

The late Qing Dynasty floral and bird screen with a rosewood frame inlaid with mother-of-pearl features birds, plum blossoms, peonies, chrysanthemums, and butterflies as its primary decorative elements. Through the interwoven arrangement of flowers, branches, leaves, birds, and butterflies, the work creates a richly layered yet well-organized composition (see Figure 1). Its pattern organization demonstrates the compositional characteristics of Cantonese embroidery, in which primary motifs and secondary decorative elements interact and complement one another. This provides a useful reference for extracting and combining floral and avian motifs and reconstructing their decorative hierarchies [12].

The Republican-era red satin Han-style front-opening cloak embroidered with flowers, butterflies, and cranes demonstrates the integration of Cantonese embroidery motifs with garment structures. Peonies, colorful butterflies, and cranes serve as the primary decorative motifs, distributed across different areas of the garment, including the body, collar, and cuffs. The patterns are executed using techniques such as liushui (the intentional use of unembroidered spaces), satin stitching, and French knots (see Figure 2). This decorative arrangement highlights the primary motifs while maintaining visual connections among different garment sections, demonstrating the coordination between thematic motifs, embroidery techniques, and garment structures [12].

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Figure 1: Late Qing Dynasty Cantonese Embroidery Floral and Bird Screen with a Rosewood Frame Inlaid with Mother-of-Pearl



Figure 2: Republican-era Red Satin Han-style Front-opening Cloak Embroidered with Flowers, Butterflies, and Cranes



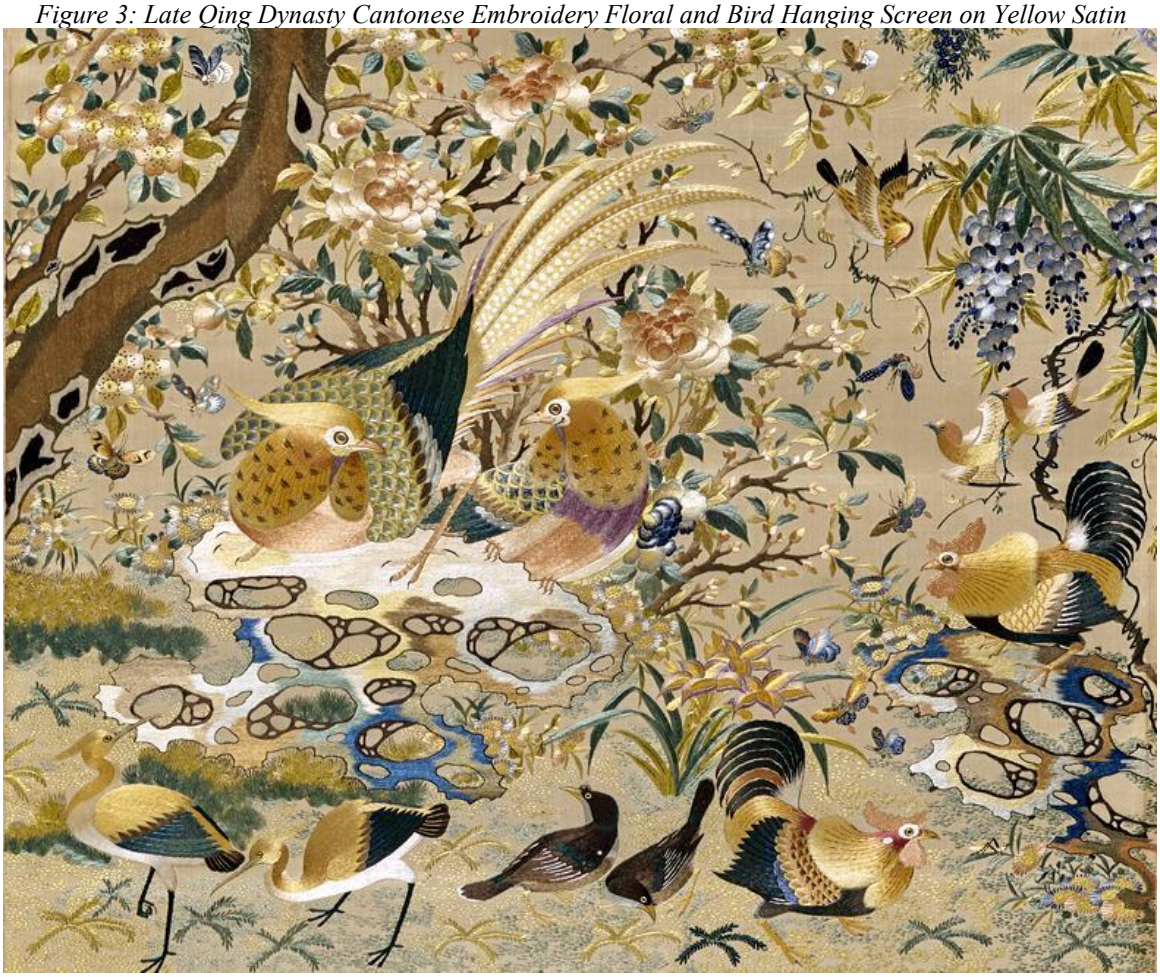
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2.3.2 Craftsmanship Bridging Case: The Liushuilu Technique in Cantonese Embroidery and Openwork Carving in Shadow Puppetry

The *liushuilu* technique in Cantonese embroidery is a decorative method that creates linear negative spaces by controlling the gaps between adjacent embroidered areas. According to relevant documentation from the Guangzhou Thirteen Hongs Museum, this technique typically maintains evenly spaced gaps of approximately 0.5 mm between neighboring embroidered sections. These narrow spaces form distinct lines between motifs such as flower petals and bird feathers, thereby emphasizing pattern contours and enhancing the visual layering of the composition [12].

The late Qing Dynasty floral and bird hanging screen embroidered on yellow satin and the Republican-era black satin jacket and skirt featuring circular floral motifs both demonstrate the application of the *liushuilu* technique in traditional Cantonese embroidery. The former uses carefully controlled gaps between floral, avian, and branch motifs to reinforce pattern boundaries and compositional depth (see Figure 3). The latter employs negative spaces to separate circular floral motifs, establishing clearer visual relationships among individual decorative units (see Figure 4). These two artifacts provide complementary references for examining the negative-space technique and its visual organization in Cantonese embroidery, particularly in floral and bird compositions and circular floral decorations [12].

Figure 3: Late Qing Dynasty Cantonese Embroidery Floral and Bird Hanging Screen on Yellow Satin



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Figure 4: Republican-era Black Satin Two-piece Jacket and Skirt with Circular Floral Motifs in Cantonese Embroidery



2.3.3 Physical Examples of Shadow Puppetry: The Beijing Shadow Puppet Figures "Warrior" and "Monkey King"

The Beijing shadow puppet figures "Warrior" and "Monkey King" demonstrate the artistic characteristics of traditional shadow puppet costumes in terms of pattern organization, carving techniques, and color expression. As shown in Figure 5, both figures feature elaborate decorative patterns on their headdresses, upper garments, waist areas, and lower garments. Geometric motifs, continuous patterns, grid patterns, and localized openwork are combined to create visually rich compositions with varied density and layered effects. Relevant documentation on Beijing shadow puppet craftsmanship indicates that traditional motifs such as *gulunqian'er*, *mantouding*, *shadi'er*, and fish-scale patterns are commonly used to decorate character headdresses and costumes. These patterns demonstrate the importance of repetitive arrangements, line organization, and localized details in traditional shadow puppet carving [7–9].

This case provides a technical reference for the cross-media translation of Cantonese embroidery's cultural genes into shadow puppet costume patterns. On the one hand, the directional characteristics and textures of embroidery stitches can be translated into linear carved patterns in shadow puppetry. On the other hand, the negative-space relationships between motif elements, such as petals and feathers, can be transformed into openwork sections. Meanwhile, during the reconstruction of continuous patterns, the structural stability of shadow puppet materials must be carefully considered. Excessive openwork should be avoided to prevent the disruption of essential connecting sections or the weakening of the overall structural integrity of the figures. This approach enables a coordinated integration of the decorative characteristics of Cantonese embroidery with the carving techniques of shadow puppetry. [7–9]

2.3.4 Embroidered Narrative Costume Case: Qing Dynasty White Gauze Women's Jacket with Theatrical Figures in Couching Embroidery

Bian Xiangyang and Yan Ting examined a Qing Dynasty white gauze women's jacket decorated with theatrical figures in couching embroidery, housed in the China National Silk Museum. Their study identified *The Romance of the Western Chamber* as the central narrative theme of the garment, with embroidered theatrical figures forming a continuous and layered visual narrative (see Figure 6). Although this artifact is neither an example of Cantonese embroidery nor a shadow puppet costume, it provides a comparative reference for translating traditional character narratives into costume patterns. This case suggests that costume pattern design should extend beyond isolated decorative elements and incorporate character identities, narrative plots,

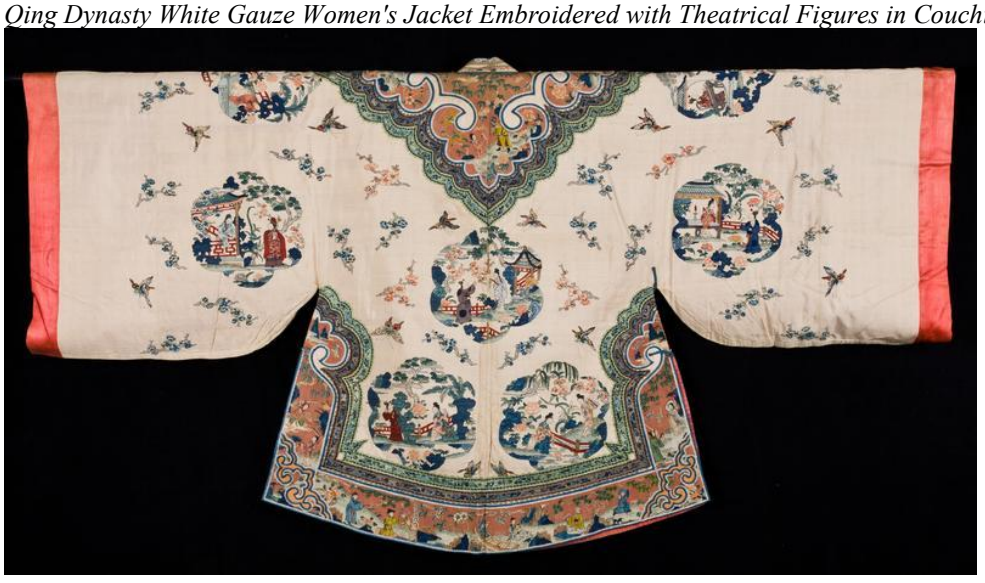
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and cultural symbolism into an integrated visual composition, thereby enhancing the narrative dimension and cultural expression of costume imagery [13].

Figure 5: Costume Patterns and Carved Decorations of Beijing Shadow Puppet Figures: "Warrior" (Left) and "Monkey King" (Right)



Figure 6: Qing Dynasty White Gauze Women's Jacket Embroidered with Theatrical Figures in Couching Stitch



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2.3.5 Export Embroidery Shawl Case: Yellow Satin Embroidered Shawl with Pavilions and Towers

The mid-18th-century yellow satin embroidered shawl featuring pavilions and towers, housed in the China National Silk Museum, represents a typical example of traditional Chinese embroidery adapted to the aesthetic preferences of overseas markets. The square-shaped shawl features a yellow satin ground and is decorated with colored silk threads using satin stitching techniques. Its decorative motifs include traditional Chinese architectural structures, theatrical figures, flowers, and birds. Traditional architectural motifs occupy the central area and four corners, while theatrical narrative figures are arranged symmetrically and repetitively at the corners. Floral and avian motifs are interspersed among the architectural elements, creating a well-organized composition with a clear visual hierarchy and balanced decorative density. The edges of the shawl are further embellished with woven mesh patterns and tassels, demonstrating the integration of traditional Chinese embroidery techniques with Western costume aesthetics [14, 15].

This case illustrates how Chinese export embroidery in the 18th century underwent comprehensive design adaptation in terms of traditional cultural themes, decorative composition, and product form during cross-cultural dissemination. Its relevance to this study lies primarily in its organization of visual hierarchy and decorative layout. In particular, its compositional arrangement, combining a central focal motif, auxiliary motifs at the four corners, and peripheral decorations, provides a reference for the layered design of primary character figures and secondary decorative elements. However, when applying this approach to shadow puppet costumes, the positions, scales, and spatial density of patterns must be appropriately adjusted to accommodate movable joints, light transmission, and projection areas. Such adaptations facilitate the transformation of traditional embroidery decorative language into the visual design of shadow puppet costumes [14, 15].

Figure 7: Yellow Satin Export Embroidered Shawl Featuring Pavilions and Towers



2.3.6 Contemporary Transformation Case: Modern Fashion and Visual Design Incorporating Shadow Puppet Elements

The graduation design project “Connecting Shadow Puppetry with Modernity” from the School of Art and Design at Guangdong University of Technology uses traditional Shaanxi shadow puppet forms and decorative motifs as design resources, integrating shadow puppet visual elements into contemporary character costumes and cultural and creative product design (see Figure 8). This case demonstrates the potential of traditional shadow puppetry for application in modern fashion design and cross-media visual expression, providing

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methodological references for the extraction, recombination, and innovative application of shadow puppet design elements. It should be noted that this project does not involve the translation of cultural genes from Cantonese embroidery. Therefore, it is considered in this study solely as a reference for the contemporary adaptation of shadow puppet elements, rather than as direct physical evidence of the integration of Cantonese embroidery and shadow puppetry [7, 9].

Figure 8: Connecting Shadow Puppetry with Modernity



3. Extraction and Cross-Media Translation of Cantonese Embroidery Patterns

3.1 Selection and Classification of Cantonese Embroidery Pattern Samples

The extraction of Cantonese embroidery patterns provides the foundation for reconstructing shadow puppet costume patterns. This study selects samples from museum collections, works by intangible cultural heritage inheritors, and traditional embroidery images with documented sources. The samples are evaluated based on cultural representativeness, visual recognizability, and craftsmanship adaptability, with their key characteristics extracted in terms of subject matter, morphology, color, and technique. Accordingly, typical Cantonese embroidery patterns are classified into four categories: floral and botanical motifs, birds, auspicious animals, and combined auspicious motifs. Their visual characteristics and corresponding translation approaches for shadow puppetry are analyzed to provide a basis for subsequent pattern reconstruction (see Table 3).

Table 3: Extraction of Cultural Genes from Typical Cantonese Embroidery Motifs and Their Translation into Shadow Puppet Costumes

Cultural Gene Category	Typical Motifs	Core Visual Characteristics	Translation into Shadow Puppet Design
Floral and Botanical Motifs	Peonies, lotus flowers, lychees	Petal, branch, leaf, and fruit structures	Petal openwork and linear branch decorations
Avian Motifs	Phoenixes, peacocks, cranes	Wings, tail feathers, and body contours	Layered feather structures and curved carving lines
Auspicious Animal Motifs	Dragons, lions, qilin	Scales, manes, and dynamic contours	Geometric simplification and localized openwork
Combined Auspicious Motifs	Floral and bird combinations; auspicious animal combinations	Symmetry, continuity, and composite compositions	Central symmetry and continuous decorative borders

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3.2 Translation Mechanism from Cantonese Embroidery Patterns to Shadow Puppet Carving Language

The translation of Cantonese embroidery patterns into shadow puppet costumes involves four key aspects: preserving cultural meanings, simplifying morphological structures, transforming craftsmanship techniques, and adapting patterns to costume areas. First, the cultural symbolism and key identifying features of the original motifs are retained. Second, contour extraction, detail simplification, and partial geometric abstraction are applied to improve their suitability for carving. Third, embroidery stitches, textures, and color gradations are translated into carved lines, openwork structures, and combinations of color blocks. Finally, pattern dimensions, proportions, and layouts are adjusted according to costume structures to avoid interfering with joint connections and character movements. The specific translation methods are summarized in Table 4.

Table 4: Correspondence Between Cantonese Embroidery Features and Their Visual Translation into Shadow Puppetry

Original Cantonese Embroidery Features	Translation Methods	Visual Expression in Shadow Puppetry
Petal contours	Contour extraction and morphological simplification	Carved outlines of petals
Feather stitches	Directional abstraction and layered treatment	Wing lines and openwork
Gold and silver thread decoration	Line enhancement and continuous arrangement	Decorative carved lines
Raised embroidery texture	Layer simplification and structural segmentation	Combined openwork patterns
Branch and leaf composition	Linear reorganization and continuity	Decorative borders on sleeves and hems
Circular floral motif structure	Central symmetry and motif-unit recombination	Main motifs on the front panels and back

3.3 Reconstruction Design of Shadow Puppet Costume Patterns

The reconstruction of shadow puppet costume patterns aims to preserve the cultural characteristics of Cantonese embroidery while meeting the technical requirements of shadow puppet carving. The design follows four principles: cultural authenticity, morphological adaptability, visual coordination, and technical feasibility. Based on the characteristics of floral, avian, auspicious animal, and continuous motifs, contour extraction, detail simplification, geometric abstraction, and motif recombination are employed to transform embroidered elements, such as petals, feathers, scales, branches, and circular floral patterns, into carved lines, openwork structures, and continuous decorative units. Pattern layouts, color gradations, and light-transmission effects are also adjusted according to costume structures, while ensuring joint connectivity, material strength, and manufacturing feasibility. These methods facilitate the integration of traditional embroidery aesthetics with the visual language of shadow puppetry.

Based on these principles, three shadow puppet costume pattern reconstruction designs are proposed (see Figure 9). **Design 1, the Phoenix Feather Costume**, extracts the phoenix's head, body, and radiating tail-feather structures from Cantonese embroidery, using layered carved lines and circular openwork to create the main decorative elements. It is suitable for female characters of noble status. **Design 2, the Peony Medallion Costume**, draws on traditional peony motifs and employs central symmetry, petal segmentation, and localized openwork to create circular floral patterns that emphasize the main decorative areas of the costume. **Design 3, the Peacock Feather Border**, extracts the rachis, barbs, and eyespot structures of peacock feathers and uses mirroring, rotation, and repetition to create continuous patterns suitable for sleeve cuffs, skirt hems, and the edges of flowing scarves. Together, the three designs explore the translation of Cantonese embroidery's cultural genes into shadow puppet costumes through three approaches: focal motif composition, centralized decorative arrangement, and continuous border patterns.

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Figure 9: Integrated Illustration of Cantonese Embroidery Pattern Extraction and Shadow Puppet Costume Reconstruction (Research Design Illustration; Not a Historical Artifact)



4. Discussion and Conclusion

This study develops a research framework for the cross-media translation of traditional Cantonese embroidery patterns into shadow puppet costumes, encompassing cultural gene extraction, visual feature deconstruction, artistic language translation, and costume pattern reconstruction. The core cultural characteristics of Cantonese embroidery are identified through four dimensions: thematic symbolism, morphological structure, color systems, and stitching textures. By considering the contour carving, openwork structures, and light-and-shadow effects of shadow puppetry, the study proposes design methods involving pattern simplification, structural recombination, craftsmanship transformation, and costume adaptation. Through the reconstruction of representative floral, avian, auspicious animal, and continuous motifs, this study explores practical approaches for translating the traditional decorative language of Cantonese embroidery into the visual language of shadow puppet costumes. The findings demonstrate that the cross-media integration of Cantonese embroidery and shadow puppetry not only expands the application of traditional embroidery patterns but also offers new perspectives for innovative design in traditional arts and crafts. Meanwhile, such design translation should be grounded in reliable historical images and cultural documentation, preserving the core forms and cultural meanings of traditional motifs. Professional input from intangible cultural heritage inheritors and shadow puppet artisans should also be incorporated to avoid the misuse of cultural symbols and the distortion of traditional craftsmanship.

This study has several limitations. The systematic collection and coverage of Cantonese embroidery pattern samples require further expansion, while the proposed translation methods need additional validation through physical shadow puppet carving, projection experiments, and expert evaluation. Future research could integrate computer vision, deep learning, and generative artificial intelligence to establish a Cantonese embroidery cultural gene database and a digital resource library of shadow puppet decorative patterns. Intelligent design methods combining cultural semantic constraints with carving-related structural constraints could also be explored. Furthermore, digital modeling, physical production, and dynamic projection experiments could be conducted to evaluate the cultural expressiveness and technical adaptability of reconstructed patterns. These efforts would promote the digital and collaborative innovation of Cantonese embroidery and shadow puppetry, providing methodological references for the digital preservation, innovative expression, and living transmission of traditional Lingnan arts and crafts.

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Conflicts of Interest

The author(s) declare no conflicts of interest.

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