Textile & Leather Review

ISSN 2623-6281 | www.tlr-journal.com | 10.31881/TLR

Traditional Song Brocade Pattern Art Style Aesthetics Application

Yanying Ma

How to cite:, Ma Y. Traditional Song Brocade Pattern Art Style Aesthetics Application. Textile & Leather Review. 2025; 8:377-403. https://doi.org/10.31881/TLR.2025.012

How to link: https://doi.org/10.31881/TLR.2025.012

Published: 14 May 2025

Traditional Song Brocade Pattern Art Style Aesthetics Application

Yanying MA

Zhejiang Fashion Institute of Technology, Ningbo 315211, Zhejiang, China myy2010702077@163.com

Article

https://doi.org/10.31881/TLR.2025.012

Received 10 April 2025; Accepted 1 May 2025; Published 14 May 2025

ABSTRACT

This study investigates the aesthetic value and modern application of traditional Song brocade patterns, aiming to highlight their cultural significance and potential in contemporary design. By analyzing the historical development, classification, and visual characteristics of Song brocade—including its four main types (heavy, fine, box, and small brocade) and four major pattern categories (geometric, botanical, animal, and figure motifs)—the research reveals the unique artistic features of these traditional patterns. Using a qualitative approach, the study examines their symbolic meanings, colour schemes, and structural aesthetics, and explores how these elements have been adapted for modern use in fashion, packaging, home decor, and other design fields. The findings show that Song brocade patterns, with their refined geometry, elegant colour tones, and culturally rich symbolism, continue to inspire modern aesthetics and bridge traditional craftsmanship with contemporary creativity. The study concludes that while Song brocade holds great potential for cultural inheritance and design innovation, future research should focus more on its technological processes and practical applications in modern contexts to further enhance its relevance and sustainability.

KEYWORDS

Song brocade, pattern, artistic style, aesthetics

INTRODUCTION

Song brocade, a treasure of traditional Chinese silk fabrics, has a history of over a thousand years [1]. Its unique weaving techniques and rich pattern designs demonstrate the high level of ancient Chinese weaving craftsmanship and contain deep cultural heritage and artistic value. Song brocade is usually made of warp twill for the ground and weft twill for the flowers. Due to the distinctive artistic style of the Song Dynasty, it is called Song brocade [2]. Its colours are often rich but not cluttered, giving a sense of elegance that is luxurious yet subtle. Song brocade is one of the three most famous brocades in China. In Suzhou, it was inscribed on the first national intangible cultural heritage list in 2006 and has since become part of the world's intangible cultural heritage. The weaving techniques of Song brocade began to take shape during the Song Dynasty and reached their peak in the Ming and Qing Dynasties. During the Spring and Autumn Period, the rudimentary forms of silk weaving techniques emerged, which laid the foundation for the development of Song brocade [3]. Over time, these

techniques were refined and evolved into the sophisticated art form that Song brocade represents today.

Song brocade pattern carries the historical and humanistic values of Chinese traditional culture, and the aesthetic characteristics behind its values and connotations harbour the aesthetic interests of the people in ancient times. As Qian Xiaoping highlights in Song Brocade, this traditional weaving art is not only a visual delight but also a cultural narrative that embodies the essence of Chinese heritage, making it a vital subject for both historical preservation and contemporary design innovation [4]. Song brocade weaving involves several specialized techniques. The "short-throw shuttle" technique refers to the use of a short-distance shuttle for detailed pattern work, enabling precise and intricate designs. In contrast, the "long-throw shuttle" technique employs a longer shuttle stroke to create broader, more expansive patterns across the fabric. The "retreat halo technique" is a sophisticated method of colour transition, where multiple layers of similar colours are arranged in a gradient from light to dark or vice versa. This creates a harmonious and visually appealing colour blend. These techniques are fundamental to the creation of Song brocade patterns, allowing for the rich visual effects that characterize this traditional fabric.

At a time when the material life of society is becoming richer and richer, the needs of spiritual life are accordingly receiving more and more attention and attention. The value orientation of the public has become richer, and the demand for culture has become more and more diversified. The Song Brocade, as China's intangible cultural heritage, actually represents the situation of a large part of intangible cultural heritage in the modern environment [5]. By studying Song brocade's pattern art style, we can modernize its visual presentation. This effort helps connect the public with traditional culture, fostering a sense of cultural attachment.

This study delves into the artistic style of Song brocade by examining its historical evolution, the categorization and structural organization of its patterns, and conducting an in-depth motif analysis. The aim is to uncover the unique artistic elements within Song brocade designs, to encapsulate the aesthetic essence of its artistic style and its practical applications. Furthermore, we seek to identify innovative strategies for the development of Song brocade patterns within the framework of contemporary aesthetics [6]. This will enhance the competitiveness of Song brocade in today's market. The insights gained from this study will also serve as a valuable reference for applying traditional artistic patterns in modern aesthetic contexts.

This study takes Song brocade as the research object and takes the aesthetic value of Song brocade as the main research direction through a multi-faceted in-depth study to deepen the understanding of Song brocade and its artistic value and fine art style, to further promote the modernization and adaptation of the culture, to promote it to obtain a new development in the current social environment, and to enhance the comprehensive competitiveness of Song brocade as an industry.

This study is organized into six sections, each of which is described below: The First and second sections are an introduction and literature review which mainly introduces the research on the application and study of the aesthetics of the artistic style of traditional Song brocade patterns at home and abroad. Section 3 focuses on the types of Song brocade. It introduces the four major categories of Song brocade divided according to different craft characteristics and use performance: heavy brocade, fine brocade, box brocade, and small brocade, and analyzes in depth the characteristics, uses, and weaving techniques of each category. Section 4 mainly introduces the types of Song brocade patterns. It discusses the rich subject matter and artistic value of Song brocade patterns, divides them into four categories: geometric patterns, botanical patterns, animal patterns, and figure patterns, and analyzes the characteristics and symbolism of each category. Section 5 mainly introduces the visual characteristics of Song brocade patterns. It analyzes the unique visual characteristics of Song brocade patterns in terms of pattern motifs, colour tones, and structural layouts, including geometric abstract patterns, rational and ethereal colour combinations, and structural layouts of formal aesthetics. Section 6 focuses on the application of Song brocade patterns in modern design. The symbolic, living, and artistic applications of Song brocade patterns in modern design are discussed, further emphasizing the value and role of Song brocade patterns in inheriting culture and enhancing modern design. Section 7 is the summary, which mainly summarizes the content of this study, outlines the importance of Song brocade as a carrier of traditional culture, emphasizes the important role of Song brocade in understanding the ancient silk knowledge and Song culture, and at the same time points out the inadequacies of this study, pointing out the direction of future research.

CURRENT SITUATION OF SONG BROCADE'S RESEARCH

At present, there are many scholars in the study of Song brocade has provided a reference and summary. A systematic and comprehensive discussion has been made on the historical development, craftsmanship, organizational structure, pattern and colour characteristics of the three famous brocades, which is of great help in understanding the craftsmanship and artistic features of Song brocades. In addition, there are more scholars on the Song brocade pattern application have been discussed. For example, in the section "Design Research on Song Brocade Patterns in Textile Patterns", Xiaoxiao S mainly discussed the basic concept of Song Brocade, and the characteristics of ornamentation [7]. Subsequently, the possibility of applying Song brocade pattern in textile pattern design is proposed. Jun W, Xueqin W and others took Song brocade as the research object and conducted research and analysis on Song brocade process characteristics and pattern characteristics [8]. After the research and analysis, the Song brocade process was applied to personalized pattern customization. Finally, Song brocade patterns were applied to handbags, dinner bags, scarves, shawls, and other clothing items. In addition, Yuxi W's chapter analyzed the Song brocade pattern, colour, and

so on, and put forward the feasibility analysis of pattern innovation [9]. Then, by analyzing the development status of the traditional Song brocade, he put forward some views on the cultural protection of the Song brocade. Meanwhile, Jiantao N and Qi H discussed the cultural value and social values of Song brocade and also analyzed the geometric patterns, animal patterns, plant patterns, and other subjects [10]. Xiaoqing L, on the other hand, mainly put forward design practice ideas on the value, development principles, and strategies of Song brocade elements applied in business etiquette products [11].

To sum up, the classification analysis of the Song brocade pattern has gained a broader consensus in China, but the application and connotation of the specific pattern are lacking, in addition, the application analysis of the Song brocade pattern mainly focuses on the application of modernization, but lacks the overall condensation of its summary, that is, the practical experience is relatively rich, but the relevant theoretical knowledge is slightly insufficient to support

TYPES OF SONG BROCADE

Song brocade can be divided into four categories according to the fineness of its production process, fabric structure, material, fabric thickness, and use of different performances: heavy brocade, fine brocade, box brocade, and small brocade [12]. Heavy brocade, the most luxurious type, is used for decoration, embroidery, and costumes. It features intricate patterns and vibrant colours created by weaving refined silk, twisted gold threads, etc., with colours arranged in staggered levels for a smooth texture. Fine brocade, the most basic and widely used, employs thin silk threads and a unique "living colour" technique. Its patterns are formed by different colour blocks and it's often used in clothing decoration and gift framing. Box brocade, a mid-range variety, has a distinct structure and uses mulberry silk, cotton, etc. Its patterns are mostly geometric or small natural flowers with strong colour contrast. Small brocade, though not a native variety, is categorized under Song brocade due to its similar uses. It uses a single warp and weft structure and is commonly used to decorate fine craft boxes. According to the organizational structure, and can be divided into heavy brocade, fine brocade categorized as large brocade, because of its organizational structure is the three twills for the ground, and three twills show flowers, Song brocade is in the Tang Dynasty twill weft brocade based on the structure of the changes, the development of the weft of the multiple fabrics, so the large brocade is Song brocade in the longest source, but also the most widely recognized varieties. The box brocade and small brocade evolved from the Song brocade, because of their use in the use of framing, and can be with the Song brocade in the "big brocade" in the same factory for production, so now also the box brocade and small brocade are broadly categorized in the Song brocade category, as shown in Figure 1.



Figure 1. The Phoenix Scroll (partial)

Heavy brocade

Among the Song brocade, heavy brocade is the thickest and most expensive variety [13]. It is mainly used in decoration, embroidery, and various kinds of costumes, and is widely popular among the people [14]. The common weaving process is to use refined and dyed silk, twisted gold threads, or pieces of gold threads as the weft threads, and then form the weft flowers of various colours on the "ground" of the three warp twill patterns. Because of its exquisite patterns and gorgeous colours, it is also known as the flower of wealth and good fortune. As a multi-stranded silk thread weaving material, the gold thread can not only decorate the main flower, but also act as a patterned borderline, so in the process of weaving using a variety of techniques, such as long-throw shuttle, short-throw shuttle, and local special throw shuttle, and also use the colour throw colour change technology, to form a vibrant colour.

The colour levels of brocade are staggered and gradually recede over time, presenting a natural and smooth texture, reflecting the elegant and gorgeous fabric style. In ancient China, heavy brocade is an important decorative silk fabric. Its pattern is colourful, common patterns are plant patterns, flower patterns, tortoise back patterns, dish tapestry patterns, and eight treasures patterns, etc., the representative varieties are "the world of bliss woven brocade shaft", "Baolian tortoise back pattern brocade" and "dragon pattern globe brocade "etc. Because of its thick texture and varied patterns, heavy brocade was widely used in palace halls and various indoor displays, such as scrolls, scrolls, wall carpets, cushions, etc., and became an indispensable work of art [15]. As shown in Figure 1, a Yuan Dynasty woven Yi Feng scroll, now in the Liaoning Provincial Museum, demonstrates the superior weaving techniques as well as the aesthetics of Song brocade during the Yuan Dynasty.

Fine brocade

Fine brocade is the most basic, popular, and representative variety of Song brocade. Fine brocade and heavy brocade show a wide range of similarities in style characteristics, organizational structure, and weaving process. Based on maintaining the original style of heavy brocade, fine brocade has developed some unique features [16]. The silk threads used in fine brocade are relatively thin, and the weight of the long throw shuttle is relatively light, at the same time, the proportion of the ground warp (also called the bottom warp) the surface warp, and the organizational structure have also undergone various changes, and the main flower is usually woven with the short throw shuttle, and the geometric pattern and the flower's branches, leaves, stems as well as the pattern's wrapping line are woven with the long throw shuttle, etc. Without increasing the thickness of the fabric, a group of one or two groups of short throw shuttles are used to carry out the colour changes, and this kind of colour treatment is also known as "living colour". This kind of colour processing is also called "live colour". The pattern of fine brocade is mainly composed of different colour blocks, generally round and square shapes, and can form a variety of patterns in different parts [17]. Mulberry silk is the main material used in the weaving of fine brocade, so the triple weft organization is a common choice. In recent times, people have begun to use mulberry silk warp and rayon weft for interweaving, to achieve the purpose of reducing costs.

Fine brocade pattern exquisite style, simple and elegant, usually with geometric patterns as the skeleton, filled with flowers, auspicious grass and artefacts and other auspicious motifs, such as the eight treasures (ancient money, Fang Sheng, qin, chess, calligraphy and painting and so on), the eight immortals (swords, fans, cypresses, gourds, green, flute, lotus and so on) and the eight auspicious (umbrellas, jugs, knots, wheels, double fish, lotus, conch) and so on [18]. In Figure 2, the Song brocade with mandarin ducks and Swiss flowers is a typical fine brocade with thin silk threads and a geometric skeleton filled with various patterns. Due to the appropriate fineness, moderate thickness, and ease of production of the silk threads used in fine brocade, it is widely used in clothing decoration, high-end calligraphy, and painting, as well as precious gifts and other framing areas.



Figure 2. Song brocade with mandarin ducks and Swiss flowers

Box brocade

Box brocade, as the Song brocade development and evolution of the formation of mid-range varieties, its organizational structure does not strictly follow the laws of Song brocade, but the use of the weft twofold or weft threefold structure, with mulberry silk, cotton, and silk colour velvet (that is, without twisting or adding a small amount of twisted refined dyed mulberry silk) intertwined and become, weaving the use of a group of long or two groups of shuttle weaving patterns and patterns, and then join a group of short shuttle to embellish, to change the patterns of the Colour [19]. As shown in Figure 3, the box brocade is woven with silk and a small amount of yarn, and most of the patterns are based on geometric patterns on the ground or natural small flowers, which are continuous and symmetrical, with strong colour contrasts.

The patterns of the box brocade are mostly full of geometric patterns or small natural-type flowers, using horizontal stripes and symmetrical arrangement, showing a rough and chic style with strong colour contrasts, similar to the ethnic minority brocades. Due to the use of natural raw materials and advanced technology, it has high artistic value and practical value [20]. The representative varieties are "water pink ground folding flowers and butterflies mixed treasure brocade", "yellow and green ground four Tianhua brocade" and so on. Box brocade warp and weft layout sparse, loose, and soft texture, often in the finished fabric on the back of a thin layer of paste, so that it is straight, for low-grade calligraphy and painting, capsule box, screen for framing.



Figure 3. Magazine

Xiaojin

Xiaojin, which is not a native variety of Song brocade, is categorized under the broad category of Song brocade because it is used for framing as well as Song brocade and is produced in the same factories as Song brocade. Xiaojin appeared in the Song Dynasty and began to be produced on a large scale in the Ming Dynasty, reaching its peak in the Qing Dynasty [21]. The construction of small brocade usually adopts a single warp and single weft, using colour-refined silk as the warp and raw silk as the weft, interwoven with different colours and patterns, made of plain or single-layered satin, variegated twill, or small jacquard fabrics, and the warp threads are used to show the flowers, for example, Yuehua brocade and Shuiwang brocade, and there are cases in which two sets of warp threads are used to intertwine the weft and warp and weft, and the warp and weft are used to show the flowers together, for example, Wanzi brocade [22]. There are also cases where two sets of warp and weft threads are interwoven and the warp and weft are woven together to show flowers, such as Wanzi brocade.

The colour of the brocade shows a calm texture, and its pattern pattern is mainly geometric and symmetrical small pattern, such as Figure 4 is a typical brocade, with clear colour and sparse pattern, which is a single-layer small jacquard fabric. The warp and weft density of brocade is low, the texture is light and thin, and also the warp line colour velvet shows flowers, usually using the traditional stone yuan bao for calendaring of the finished product [23]. Kobayashi, as the most common brocade in the decorative field, is usually used to decorate fine crafts brocade boxes, such as fan boxes, silverware boxes, coloured egg boxes, etc., and its edges are usually treated with inlay.



Figure 4. Xiaojin

TYPES OF SONG BROCADE PATTERN

As one of the important representatives of China's intangible cultural heritage, the Song brocade pattern contains profound artistic and humanistic values [24]. Through the artistic analysis of the Song brocade pattern from the surface to the inside and the artistic interpretation of Song brocade pattern, we can re-examine the survival and development status of the Song brocade pattern in the present time, and at the same time, provide a useful historical reference for how to inherit and innovate it in the modern design context.

The motifs of Song brocade have a long history, inheriting the historical motifs of Shu brocade, but with the change of time, the promotion of the Silk Road, the fusion and convergence of Chinese and Western cultures, and the artistic style of each dynasty, the motifs of Song brocade have become more colourful and diverse, and some of them even have the epitome of the times.

Generally speaking, the pattern is divided according to the theme, because of the wide variety of subjects, rich and varied content and form, the application function also has its focus, part of the subject matter of the pattern is often not presented separately, but through the combination of various subjects, the comprehensive application of the formation of peculiar and ingenious artistic characteristics and specific symbolic meaning, this study will be divided into four categories of Song brocade pattern, respectively, geometric pattern, botanical pattern, animal pattern, and character motifs.

Geometric patterns

The geometric pattern is the most prominent and common type of Song brocade pattern. As a traditional pattern with an important position in Chinese traditional embroidery patterns, it can reflect the culture of the times in different historical backgrounds [25]. The geometric pattern usually takes

points, lines, and surfaces as the basic symbols, and under the basic framework of geometric forms (with vertical lines, horizontal lines and diagonal lines as the basic framework of squares and meters), the intersections of vertical lines, horizontal lines and diagonal lines are covered with geometric shapes to form the pattern patterns, including the ball and ball road pattern composed of intersecting and cutting with circles, and the disk and tapestry pattern composed of overlapping circles, etc [26]. The geometric pattern is the most important and common type of Song brocade pattern, and it reflects the culture of different times in different historical backgrounds.

The use of pure geometric forms in Song brocade is relatively rare, often through panning repetition, symmetrical interlacing, size change, superposition, and other techniques to show that the form can not only highlight the main pattern, but also cover up the texture of the Song brocade may be flawed, such as the Bada halo pattern, Tianhua brocade pattern and composite pattern, etc., and their interlocking overlap and the design of the auspicious meaning, which together constitute this unique pattern [27]. Common geometric patterns include:tortoise-back pattern, ball and road pattern, ten thousand characters pattern, square chess pattern, four-da halo pattern, six-da halo pattern, eight-da halo pattern, and so on.

The Wanzi brocade (Figure 5), is a special symbol in ancient times, symbolizing the sun or fire, and it is also one of the thirty-two phases of Sakyamuni in Buddhism, which represents the meaning of good fortune, and means "the collection of good fortune" in Sanskrit, and possesses the meaning of "ten thousand blessings and ten thousand lifetimes". It has the meaning of "ten thousand blessings and ten thousand lifetimes" [28]. Meanwhile, because of its symbolism of prolonging ten thousand generations and having all things go well, it has been gradually applied to daily life and has become a common pattern on all kinds of fabrics, artefacts, and embroideries.



Figure 5. Vanguard pattern

Turtleback pattern, i.e. pattern shaped like turtle armour texture, with hexagonal joint beads or straight lines as the skeleton, the middle is usually filled with twining branches or folded branches and other floral subjects in a quadrilateral continuous repetitive arrangement (Figure 6). Symbol of longevity, the ancient pursuit of immortality wishes [29]. And because the hexagon itself has a strong adaptability, so in the Song Dynasty when the application reached a peak.

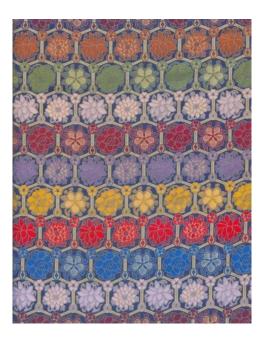


Figure 6. Turtleback flower brocade with blue background

Bada halo pattern, is a complex geometric pattern, its structure is centred on a circle, through vertical lines, horizontal lines, and diagonal lines to extend in all directions, showing the shape of the word "m", such as Figure 7, that is, a typical Bada halo pattern, this kind of pattern implies that all directions and eight roads are connected [30]. The Tianhua brocade derived from the Bada halo pattern is also the same, with secondary patterns filled with flowers. Similarly, there are four halo patterns, six halo patterns, etc., showing a dignified and dignified, rich in the characteristics of change, widely popular in the Song Dynasty, and loved by the royal nobles.



Figure 7. Bada halo pattern

Botanical patterns

In traditional Song brocade patterns, in addition to geometric patterns, many of the motifs are also derived from plants and flowers in nature. Most of the floral motifs are based on floral elements, supplemented by plant veins, usually in the form of clusters of flowers, twining branches, and folding branches, which have been refined and simplified to retain the characteristics of traditional flowers while maintaining their dynamic beauty [31]. The motifs continue the botanical motifs of the Sui and Tang dynasties, mostly flower varieties that signify good fortune or elegant sentiment, with common botanical motifs such as the treasure phase pattern, the lotus pattern, the peony pattern, the pomegranate pattern, and the Yinan (daylily) pattern, etc. As in Figure 8, the deformed trailing-vine pattern graphic as a skeleton and as a motif appears to be original.



Figure 8. Autumn fragrance ground with trailing grass pattern and gold fine brocade

One of the botanical patterns worth mentioning is the treasure phase pattern, from Figure 9, a typical treasure phase pattern in Song brocade. Treasure phase pattern is not natural, but a combination of various flower patterns [32]. This pattern was originally a fine gold production technique embedded in gold, silver, and jewels during the Wei, Jin, and North and South Dynasties, and was creatively applied to brocade patterns in the Tang Dynasty, becoming a classic feature of Song brocade patterns with its rich structure and splendid shape [33]. At the same time, the treasure phase pattern, as an auspicious motif in Chinese Buddhism, also has an auspicious symbolic meaning and is known as the "Three Treasures of Auspiciousness" together with the Money Tree and the Jubao Basin.



Figure 9. Treasure phase pattern

Animal Patterns

Animal motifs appeared relatively early in history, in the early stage of China's craftsmanship., containing auspicious symbols of dragons, phoenixes, horses, cranes, unicorns, and other animal images are often geometrized, in the form of abstract totems in the brocade, the form is relatively simple but has a high degree of recognition (As presented in Figure 10), the fish motifs, and algae patterns, wave pattern combination of use, the fish motifs carved lines briefly clear and full of a sense of dynamism, has a strong degree of recognition. It has a strong degree of recognizability. With the development of time, the shape of the pattern usually changes, and the same animal pattern in each period also shows different shapes and styles.



Figure 10. Flying fish patch

Like geometric and botanical motifs, animal motifs hold auspicious symbolism. The most common animal patterns are fish and turtles. If like a turtle, symbolizing longevity; if like a fish, symbolizing the precipitation of the years, implying the abundance of wealth, such as Figure 11, navy blue goldfish algae brocade, goldfish algae brocade by seven different colours of the goldfish composition, with algae, water snails, shells, lotus and other auxiliary patterns, as a metaphor for living a happy life, living in peace and prosperity of a harmonious atmosphere; Crane symbolizes the noble virtues and high integrity. Common animal motifs include:lion, dragon, parrot, and deer.



Figure 11. Goldfish and algae brocade on Tibetan blue ground

During the Northern Dynasty, the lion pattern began to appear on silk fabrics. And by the Tang and Song Dynasties, it had become a widely circulated pattern. As the level of socio-economic and cultural development was not high at that time, the requirements for the decorative style of the pattern were

not strict, so the lion pattern was widely spread. The lion is a kind of high-profile animal pattern, not only because it is known as "the king of beasts", a symbol of courage and fearlessness, but also because people give it the symbolism of warding off evil spirits, the Song Dynasty will be more used in the court dress of the officials, showing its unique charm.

Character Patterns

Character patterns in murals, coloured pottery, and other artefacts are the application of a wide range, while the application of the Song brocade silk material is relatively small, the performance of the people living, working, and playing the scene. Most of the character patterns are dominated by Buddhist figures, children, and so on. In the figure pattern, the most famous is the Qianlong period of heavy brocade "Western bliss world scroll", it is to Amitabha Buddha as the centre, in the Buddha's light, auspicious clouds around, the palace stand in the environment, present 278 different demeanour, Buddha, can be regarded as a rare treasure.

In addition, the baby play figure, and a hundred children figure are also common character patterns, the character scene is full of childish fun, and the picture is simple and lovely, sending the ancient people for the "grandchildren" of the good thoughts. As shown in Figure 12, Song Brocade's "Hundred Children Play" hanging scroll, the characters in the picture have vivid images, movement, and colour, showing a relatively high level of Song Brocade skills.

In addition, with the prosperous development of the commodity economy, the rise of the market class, and the gradual popularization of secular culture in the Song Dynasty, people began to combine the worship of immortals and Buddhas with folk customs, which were presented on brocade through the form of patterns. In the Song Dynasty, brocade patterns were rich in themes and varieties, mainly including three categories of auspicious decorations, animal and plant patterns, and religious decorations. In addition to geometric, plant, animal, and character patterns, there were also artefacts, meteorology, text patterns, and other types of patterns, and this diversity of patterns constituted a blossoming scene.



Figure 12. Hanging scroll "Hundred sons playing"

VISUAL CHARACTERISTICS OF SONG BROCADE PATTERNS

Lukacs spoke from the perspective of art philosophy, "pattern itself can be defined as such, it is aesthetic for emotional stimulation of its complete image, its constituent elements are composed of rhythm, symmetry, proportion and other forms of abstract response". The patterns of Song brocade are colourful, which is the aesthetic reflection and artistic connotation of each era. In the long process of historical development, the Song brocade pattern has formed its unique visual characteristics.

Geometric Abstract Patterns and Motifs

As far as we can see, geometric pattern is the most long-standing and common pattern in the history of Chinese patterns. It relies on the structural layout under the law of form and beauty and has continued for thousands of years without fail [34]. From the initial Spring and Autumn and Warring States before the basic geometric shapes composed of points, lines, and surfaces through the repetition, superposition, transformation, symmetry, and other techniques to enrich the then more single geometric ornamentation, forming a new continuous pattern, such as Figure 13, the main pattern skeleton using a simple combination of geometric shapes, became the main idea of the Song brocade pattern design. Since then, successive emperors have begun to take it as the mother of the pattern along the development of the Song brocade pattern to the Ming and Qing Dynasties and even modern, so that it has a unique artistic aesthetic.



Figure 13. Song brocade with colourful woven dragons on blue ground

Therefore, the geometric abstract pattern studied in this study not only includes simple squares, circles, and other similar pure geometric form patterns but also covers the pattern with geometric characteristics of the expression, which is also the most significant difference between the Song brocade pattern and another brocade pattern.

Geometric abstract pattern is mainly expressed by the basic dots, straight lines, short lines, curves, blocks, and other geometric elements, through the design language of shaping, constitute a circle, triangle, quadrilateral, rhombus, polygon, hexagon, octagon, etc. Rules well, complicated but not chaotic geometric pattern, in the visual generally presents for the structure of the regularity of the layout of the layout of the balance of the form of the pattern characteristics of the rigorous.

By organizing and summarizing the geometrically abstracted pattern patterns, they can be roughly divided into two categories. The first category is the geometric skeleton pattern. Most of the patterns of this type to "m" for the skeleton structure (such as four haloes, six haloes, eight haloes, square and round composite pattern, etc.), to the intersection as the centre of the horizontal, vertical and diagonal lines and extended and decorated with square, round or polygonal geometric patterns, and at the same time in the structure of the flower pattern or geometric pattern filling, and based on the geometric number of the skeleton line to determine the name of the pattern [35]. The name of the pattern is determined by the geometric number of the skeleton lines. Regardless of the complexity or simplicity of the pattern, the overall composition of the pattern is supported by a simple and clear geometric skeleton, which is dignified and solemn without losing the changes, presenting the visual sense of the pattern within the pattern, rich in rhythmic beauty.

The second category is the skeleton pattern, which adopts continuous patterns or graphics and simple and clear form, through clever geometric changes in the regular, continuous, symmetrical arrangement, showing a rich, continuous visual effect, such as in Figure 14, the yellow earth road vulture pattern brocade, that is, the continuous geometric pattern as the main body, which can stand

alone, but also can show a rich continuous visual effect. This type of pattern can be used either alone or as the ground pattern of other main patterns, such as the above-mentioned "Wanzi brocade pattern", which has a strong decorative effect and is full of vitality.



Figure 14. Yellow Earth Road brocade with vulture pattern

With time, the enhancement of aesthetic interest, and the evolution of geometric patterns, a form of brocade started to appear through the interlocking arrangement of the multi-level skeleton, which is filled with a variety of complex patterns, such as the Hui pattern, the ancient money pattern, and the curved water pattern, presenting a kind of geometric pattern known as "Tianhua brocade". The basic geometric skeleton of the pattern will not change too much, but through the continuous injection of new patterns to make the main flower prominent, the brocade style and brocade pattern is full of changes, to achieve the content of the red tape, the composition of the atmosphere, the form of dignified, sophisticated pattern features.

Rational and elegant colour tone

Colours have always contained strong philosophical ideas and symbolism, especially in the development of arts and crafts. But as the unique aesthetic style of Song brocade, colour also influences the visual effect and characteristics of its patterns. Influenced by the thought of Cheng-Zhu rationalist "talking about the reason but not emotion", Song brocade presents distinctive colour layers, calm and subtle, and seems to be in pursuit of a kind of elegant and rigorous rational beauty [36]. At the same time and because of the influence of Confucianism on the idea of desire, Song brocade

pattern colour often presents a light, soft, elegant, solemn temperament, mainly in cold tones, occasionally using saturated colours to enhance or embellish patterns, more use of green, green, brown, black and other cold tones, or teal, lotus root and other complex colours with white, so that the pattern level is richer, to seek the serenity of the meaning of the deep and far-reaching. Compared with the gorgeous and colourful Tang brocade, two very different artistic styles were formed.

Song brocade pattern focuses on the coordination between the main colour and the secondary colour. The use of softer ground colours, such as vermilion, beige, blue-grey, vermilion-grey, mud gold, lake colour, etc., with contrasting main colours, so that it is colourful but not vulgar, simple, and elegant [37]. Its colour processing techniques mainly for the retreat halo technique, that is, through the transition from shallow to deep, from deep to shallow several levels of similar colours, generally do not use strong complementary or contrasting colours, and are decorated with gold wire hook to reconcile, the overall presentation of simple and elegant, harmonious and beautiful effect.

In the way of colour harmony, the Song brocade pattern uses saturation and brightness contrast expression, rather than using the contrast of hue, and more use of the intermediate harmonic colour, in the harmony of change, the change of harmony, not the pursuit of strong contrast effect, the overall presentation of grey but the not boring grey tone, to achieve coordination and calm, calm and elegant colour effect.

In terms of colour layout, through the flexible use of "long-throw colours", "short-throw colours" and "interval colours", the pattern style is simple, harmonious, and elegant. Generally speaking, the global colour distribution is mainly based on the long-throw colour, which sets the tone; at the same time, after appropriate adjustments and modifications on the flower pattern, the whole work is more harmonious and unified. The short and compact throw colours are used as the base to create a vibrant, bright, and lively atmosphere; the intermediate colours are used as embellishments and foils to create a harmonious and warm atmosphere [38]. By alternating different colours to achieve the effect of coordinated transition, thus creating a calm and elegant colour atmosphere.

Traditional Song brocade is mainly for the royal relatives and court nobles, so its pattern colour scheme by the ruling class, follows the Chinese yin and yang "five elements doctrine", the colour is mostly yellow, white, green, red, and black five colours. Among them, the yellow tone symbolizes the noble imperial power, presenting the authority of the ruling class. With the progress of the times, the modern Song brocade pattern in the colour configuration has maintained an elegant and low-key style, because modern people respect simplicity and freedom, so the colour tone has become simple and casual.

STRUCTURAL LAYOUT OF FORMAL AESTHETICS

Layout forms of variation and harmonization

Change and unity are the general law of the development of formal beauty, also known as "variety and unity". "Change" refers to the differences in the details of the pattern, so that the pattern is different from the pattern; "unity" refers to the overall visual connection of the pattern, so that the pattern as a whole produces a sense of harmony. If the work as a whole presents a disorganized state, and in the local present a fragmented state, then such works can not be regarded as true artistry. Song brocade pattern will be through the change and unity of the law of formal beauty, so that its unity in the changes, changes in the unity, in a coordinated and unified structural layout contains a subtle change so that the whole pattern is rich in beauty and unique and rich in connotations.

Structural rules of symmetry and balance

Symmetry and balance mean that the parts of the overall pattern correspond to the same volume according to the actual or imaginary symmetry axis and symmetry point, which has the balanced beauty of stability and unity. This balanced beauty, on the one hand, is reflected in the visual sense of balance, on the other hand, is reflected in the human heart to pursue a stable and safe psychological feeling. "Symmetry" is about solemn beauty, which means that the pattern will be according to a certain law or rule to produce the corresponding relationship so that the two sides of the graphic pattern are the same, this same embodied in the same shape or the same area of the same balance, give a person a sense of rigorous structure, harmony, and stability. "Balance" refers to the beauty of harmony, which means that the size of the pattern, the colour tone, and the composition of the picture, all pay attention to harmony and uniformity, so that the pattern has a sense of change and vividness in the stability of the pattern.

The organizational rhythm of continuity and repetition

Continuity and repetition a more important ways of expression in the Song brocade pattern composition, which forms a continuous pattern through the repeated presentation of some morphological elements or graphic elements in an organized and regular manner, so that people can feel the dynamic regularity visually and produce a corresponding sense of rhythm psychologically. "Continuity" refers to the connection between repetitions, and "repetition" refers to the extension between repetitions. In traditional Chinese patterns, the composition of continuity and repetition is used in a large number of ways, and later developed into two-square continuity and four-square continuity of brocade patterns, and this continuity and repetition of strong and repeated in the vertical

and horizontal arrangement of the pattern pattern, but also be given to the people of the endless and uninterrupted good symbolism.

More common in Song brocade is the four-way continuous arrangement, this arrangement not only allows the pattern to stand alone as a pattern for the brocade but also allows the pattern to act as a ground pattern or accompaniment. As shown in Figure 15, the eight Ruyi dragon Tianhua brocade, the pattern to the diamond pattern for the unit graphics, to the surrounding repeated extension, pattern harmony and unity, the rhythm of proportionality, but also rich in change [39]. The dragon pattern on top of the lattice, whether as the main pattern filler pattern or accompanying pattern, uses the technique of continuity and repetition, so that the whole brocade surface presents a stable order and rhythmic beauty.



Figure 15. Eight Harmonies of Ruyi Dragon Pattern Tianhua Brocade

AESTHETIC ANALYSIS OF SONG BROCADE PATTERN IN PRACTICAL APPLICATION

Application of symbolization

As an ancient decorative symbol, the most basic geometric pattern in the Song brocade pattern has been handed down to the present day, which is the aesthetic creation of people in the process of production and labour practice, and has been continuously fused and developed and deformed over a long period in the history, and finally evolved into a part of Song brocade, which has become a special visual symbol full of its cultural connotation and scientific and technological content [40]. The value of Song brocade cultural symbols is much more important than the specific design behaviour. The

significance of cultural symbols is not only the most effective act of designing direction through designing ideas but also the most concentrated and generalized theoretical basis for revealing the beauty of human designing behaviour.

In modern decorative fabric design, Song brocade's geometric patterns, rich in cultural heritage, not only create a striking visual impact but also enhance national and cultural identity. These patterns form a unique cultural emblem, linking people and objects in a symbolic world. The world of symbols is composed of geometric patterns of Song brocade.

Through the extraction and re-interpretation of the colours, patterns, connotations, and other symbols of the geometric patterns of Song brocade to inherit and promote the culture of Song brocade, through this symbolic reappearance to evoke the cultural value of Song brocade that had been ignored, to give people the most intuitive feeling and impact of Song brocade in terms of the external modelling, and to transmit the characteristics and atmosphere of Song brocade created by the patterns of Song brocade through the two major carriers of symbols and decorative fabrics. The "programmed" and "rationalized" features and atmosphere created by the Song brocade pattern are conveyed through the two carriers of symbols and decorative fabrics.

Application of Living

With the richness of modern material and cultural life and changes in people's aesthetic interests, geometric patterns, and abstract patterns are increasingly favoured by modern consumers. This kind of pattern subject matter is simple and bright, unique decorative interest, often with points, lines, surfaces, and other simple graphic elements, quite interesting combinations, arrangements, changes, the formation of light and lively, or bold and bold, or warm rubbing and elegant and other decorative interests of the pattern, presenting a static in the appropriate, rhythmic and rhythmic distinctive decorative features. Geometric pattern subjects not only have a traditional style but also a very modern decorative sense, are loved by many young people, and are one of the modern decorative fabrics increasingly popular in school. Decorative fabric design originates from life, serves in life, is people's love of life and the pursuit of the spirit of the performance, with the progress of social productivity and the development of spiritual civilization, people for the decorative fabric design put forward higher requirements, including for the demand for a higher taste, emotional support, status embodiment and so on.

Song brocade pattern comes from the great artistic creation of the ancients in the production life, is the result of the labouring people in the "view of the object to take the image", is through the observation and perception of life, in the form of artistic expression, through the combination of technology and art to convey the performance of the limited form of the ancients of the production life, ideology, ideology and culture, social system, aesthetic interests and the desire for a better life is

a figurative expression of the abstract ideas. In its limited form, it highly condenses the production life, ideology, thought and culture, social system, aesthetic taste, and aspiration for a better life of the ancient people, and is the figurative expression of abstract ideas. Originating from life and higher than life has a strong flavour of life. In the design of decorative fabrics, people's psychological and emotional integration, comprehensive artistic infectivity, and affinity between objects and people far exceed the value and charm of the design itself, Song brocade patterns emanate a rational, cultural, artistic atmosphere decorative and enriching life, but also to make the semantics of culture more full. The combination of Song brocade geometric patterns and decorative fabrics tries to reproduce rational thinking, scholarly culture, and the unique connotation with Jiangnan flavour behind Song brocade through the external image of Song brocade geometric patterns, giving people a new taste of life.

Application of Artistic

The process of Song brocade pattern design is also the process of artistic creation and artistic expression, the designer based on their design level of cultural cognition, according to the aesthetic taste and interests of the consumer object, the design intention in the mind into reality. In this process, it is necessary to consider the requirements of the material level as well as to meet the needs of people's spiritual and cultural aspects [41]. A prime example of Song brocade's modern application is the "Modern Heritage" collection by the brand "Orient Trends." Launched in spring 2023, this collection reimagined traditional Song brocade patterns through a contemporary fashion lens. Designers selected classic Song brocade geometric and floral patterns, simplifying and enlarging them to fit modern aesthetics. They were digitally printed onto lightweight fabrics like silk and cotton, making the patterns more accessible for everyday wear. In Chinese traditional art, context is an important criterion for artistic creation, Chinese traditional art emphasizes both God and form, and the current new Chinese home textile product design pays special attention to the conveyance of traditional Chinese cultural meaning, whether in the use of elements, combinations, or colour collocation, all pay attention to the expression of which Songfang cultural connotations, conveying the artistry of traditional culture. Taking the art of painting as inspiration and applying it in decorative art is a common means of expression in the modern new Chinese style.

CONCLUSION

This study discusses in depth the aesthetics of the pattern art style of traditional Song brocade and its application in modern design, revealing the unique artistic value and cultural significance of Song brocade as China's intangible cultural heritage through a meticulous analysis of its historical background, weaving techniques, pattern types, and visual characteristics. This study first outlines the four major categories of Song brocade, as well as their respective characteristics and uses. On this

basis, the study further explores the types of Song brocade patterns, including geometric patterns, botanical patterns, animal patterns, and human figures, and provides an in-depth analysis of the artistic characteristics and symbolic meanings of each pattern. In addition, the study also analyzes the visual characteristics of Song brocade patterns, including geometric abstract patterns, rational and elegant colour tones, and formal aesthetics of structural layout, showing the uniqueness of Song brocade patterns in terms of aesthetics and historical evolution. Finally, the article discusses the symbolic, living, and artistic applications of Song brocade patterns in modern design, emphasizing their important value in cultural heritage and modern design.

Although this study comprehensively analyzes and researches the aesthetics of the Song brocade pattern art style, there are still some shortcomings. Firstly, the specific application cases of Song brocade patterns in modern design are not sufficiently analyzed, and secondly, this study is more macroscopic in exploring the cultural value and aesthetic characteristics of Song brocade patterns, and not deep enough in exploring the details of the pattern's technological skills and production process. In future research, we can further collect and analyze the practical cases of the Song brocade pattern in modern design to show its application effect and innovation way in contemporary design more specifically, in addition, we can pay more attention to the production process and technological innovation of Song brocade pattern, to promote the inheritance and development of Song brocade art. To summarize, future research can carry out more in-depth discussions on the modern application, technology, and international dissemination of Song brocade patterns, to provide more comprehensive and specific theoretical support and practical guidance for the inheritance and innovation of Song brocade art.

Conflicts of Interest

The author declares no conflict of interest.

Funding

This research received no external funding.

REFERENCES

- [1] Wen R, Wang G, Wu S, Shen H. Design of song brocade products based on the raw fabric piece dyeing process. Adv Text Technol. 2022; 30(2):141–145. https://doi.org/10.19398/j.att.202012012
- [2] Zhang X, Jin Z, Hu L, Zhou X, Yang K, Kremenakova D, Militky J. A silver yarn-incorporated song brocade fabric with enhanced electromagnetic shielding. Materials; 2021, 14(14):37–79. https://doi.org/10.3390/ma14143779

- [3] Zhang F, Krotova T. The influence of silk road culture on modern design:artistic features of chinese brocade patterns. Art Des. 2024; 5(1):56–67. https://doi.org/10.30857/2617-0272.2024.1.5
- [4] Qian X. Chinese Song Brocade. Jiangsu: Suzhou University pres, 2012.
- [5] Feng H, Sheng X, Zhang L, Liu Y, Gu B. Colour analysis of brocade from the 4th to 8th centuries driven by image-based matching network modeling. Appl Sci. 2024; 14(17):7802. https://doi.org/10.3390/app14177802
- [6] Wang J. Land and people: the sixteen prefectures of yan and yun during the liao-song-jin transition. Journal of Song-Yuan Studies. 2022; 51(1):73–124.
 https://doi.org/10.1353/sys.2022.0007
- [7] Shui X, Wu H, Gong M. The pattern design of Song Jin and its application in clothing . Jiangsu Silk. 2021; 1(05):14–20. https://doi.org/10.3969/j.issn.1003-9910.2021.05.005
- [8] Wang J, Wang X, Jin Z, Wu J, Liu Y. Feasibility and design cases of applying Song brocade craftsmanship to personalized pattern customization. Silk. 2018; 55(06):59–63. https://doi.org/10.3969/j.issn.1001-7003.2018.06.010
- [9] Wang Y. The innovative design development and significance of new Song brocade patterns. Industrial Design. 2018; 1(08):107–108. https://doi.org/10.3969/j.issn.1672-7053.2018.08.041
- [10] Nie Z, Huang Z. Digital technology promotes innovative design and development of silk intangible cultural heritage products. Shanghai Apparel. 2024; 1(05):105–107.
- [11] Liu X. The artistic aesthetics and innovative design of Song brocade patterns. Western Leather. 2024; 46(17):94–96. https://doi.org/10.20143/j.1671-16024.2024.17.094
- [12] Zhang Y. The value manifestation and living heritage strategy of the pattern of chinese zhuang brocade. Kurdish Studies. 2023; 11(2):2544–2559.
- [13] Zhao W, Cui R, Li N. Design and cultural aspects of 20th century chinese xiangjin brocade. Fibres & Textiles in Eastern Europe. 2022; 30(3):116–129. https://doi.org/10.2478/ftee-2022-0030
- [14] Zhu J, Winagle L, Kao HL. EcoThreads: Prototyping Biodegradable E-Textiles through Thread-Based Fabrication. Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems. CHI '24 Association for Computing Machinery: New York, NY, USA, 2024, 1–17. https://doi.org/10.1145/3613904.3642718
- [15] Lakshmi V, Shirin Hima Bindu E. History of interior design. Asian Journal of Philosophy. 2023; 34(45):94–110. https://doi.org/10.58321/AATCCReview.2023.11.02.94
- [16] Aurora N, Chrysoberyl T, Rudiansyah R. The uniqueness of sichuan brocade and batik solo artwork.

 J Lang Lit Arts. 2024; 4(10):1074–1083. https://doi.org/10.17977/um064v4i102024p1074-1083
- [17] Cheng X, Ma H. Fine Gauze, Silk, Raw Silk, Satin, Brocade ProQuest. 2022; 12(6):23-35.
- [18] Su X, Liu J, Tang C. Research on the creative design of tujia brocade pattern based on the principle

- of artistic conception drawing. ITM Web Conf. 2022; 45(6):10–95. https://doi.org/10.1051/itmconf/20224501095
- [19] Huang Y, Pan Y. Discovery and extraction of cultural traits in intangible cultural heritages based on kansei engineering:taking zhuang brocade weaving techniques as an example. Appl Sci. 2021; 11(23):11403. https://doi.org/10.3390/app112311403
- [20] He Z, Mayusoh C. Research on the development strategy of hainan li brocade cultural and creative products . Humanit Soc Sci Nakhonsawan Rajabhat Univ Acad J. 2023; 11(1):198–216.
- [21] Shao Q, Wen X, White P. Design Thinking under the Qing Dynasty. A Brief History of Chinese Design Thought. Springer Nature: Singapore; 2022. p. 225–272. https://doi.org/10.1007/978-981-16-9408-0 8
- [22] Su Y, Yang Z. Study on the innovative application of zhuang brocade dress patterns in women's products . Sci Soc Res. 2024; 6(3):254–260. https://doi.org/10.26689/ssr.v6i3.6490
- [23] Sun Y, Liu Z, Silberman J. Fabric composition and wearability analysis of zhuanghua. Fibres & Textiles in Eastern Europe. 2022; 30(4):9–20. https://doi.org/10.2478/ftee-2022-0033
- [24] Zhao Y. Research on smart teaching method of fashion innovation and development of creation aesthetics in lingnan nine intangible cultural heritage. Front Art Res. 2021; 3(4):1–22. https://doi.org/10.25236/FAR.2021.030413
- [25] Wang W, Wei J, Wang F, Zhang X, Ren X. Preference analysis of traditional handicraft brocade pattern in fashion art. J Phys:Conf Ser. 2021; 1790(1):12–28. https://doi.org/10.1088/1742-6596/1790/1/012028
- [26] Yu Z. "Five Stars Rising in the East":The Story of the Mysterious Brocade Arm Protector. All About Chinese Culture: An Illustrated Story of China in 10 Cultural Relics. Springer Nature: Singapore; 2023. p. 147–186. https://doi.org/10.1007/978-981-99-3451-5 6
- [27] Ma H. Research on the globalized dissemination and cultural "dialogue" function of silk goods in jiangnan of China in the late ming dynasty. Eng Adv. 2023; 7(4):772–779. https://doi.org/10.26855/jhass.2023.04.023
- [28] Li J. Imagery in buddhist art:the evolution of the worship of buddha vairochana and the five buddha families. Eng Adv. 2024; 34(33):12–19.
- [29] Zhao H, Xie G, Gao Z. Automatic generation method of turtle back pattern based on mathematical rules. J Beijing Univ Posts Telecommun. 2022; 45(4):110–119. https://doi.org/10.13190/j.jbupt.2021-100
- [30] Zhou G. Cultural implication of jiarong tibetan brocade belt. Sci Soc Res. 2021; 3(1):22–42. https://doi.org/10.36922/ssr.v3i1.1054
- [31] Liu X, Zhang J. Research on Digital Design of Tujia Brocade Patterns Based on Style Migration Algorithm. 2024 6th International Conference on Communications, Information System and

- Computer Engineering (CISCE). 2024. p. 607–611. https://doi.org/10.1109/CISCE62493.2024.10653156
- [32] Wang L. A Study on the Baoxiang Flower Pattern in the Decorative Art of Tibetan Carpets. Atlantis Press. 2021; 543–547. https://doi.org/10.2991/assehr.k.210106.106
- [33] Tomasic Z. Traditional chinese art and culture in contemporary chinese fashion. Traditional Chinese Art and Culture in Contemporary Chinese Fashion. 2023; 3(4):24–29.
- [34] Qing G, Nor Z, Ghazali R. Research on the application of tang dynasty round flower pattern in modern fashion design. Int J Adv Res Educ Soc. 2023; 5(3):194–200.
- [35] Mo J, Jiang X, Li Z. Analysis of the artistic characteristics of lotus patterns and digital innovative design methods. Front Art Res. 2023; 5(7):11–25. https://doi.org/10.25236/FAR.2023.050705
- [36] Liu J. The metaphysical as the ethical:a pragmatist reading of wang yangming's "the mind is the principle". Asian J Philos. 2024; 3(1):15–20. https://doi.org/10.1007/s44204-024-00149-8
- [37] Aragon L. Pluralities of power in Indonesia's intellectual property law, regional arts and religious freedom debates. Anthropol Forum. 2022; 32(1):20–40. https://doi.org/10.1080/00664677.2022.2042793
- [38] Huang Y, Wen X, Xing R, Wang Y, Wu L, Song W. Design and Implementation of Brocade Ash Pile Exhibiting Platform Using Human-Computer Interaction and Web-Based Technologies. Atlantis Press. 2023; 221–228. https://doi.org/10.2991/978-2-38476-170-8 23
- [39] Talati N, Ye H, Yang Y, Belayneh L, Chen K, Blaauw D, Mudge T. Accelerating Graph Pattern Mining Using near Data Processing. Proceedings of the 49th Annual International Symposium on Computer Architecture. ISCA '22 Association for Computing Machinery: New York, NY, USA, 2022. p. 146–159. https://doi.org/10.1145/3470496.3527437
- [40] Tian Y, Sikka S. In the context of social memory:a historical study of the guangxi zhuang brocade.

 J Multidiscip Humanit Soc Sci. 2024; 7(5):2924–2942.
- [41] Chen X. The enablers and challenges in using parameterized graphic design method to create innovation in the guangxi zhuang brocade graphics from a multiple perspective. J Roi Kaensarn Acad. 2024; 9(7):291–304.