

# A Study on the Design and Development of Carpet Using Li Textile Patterns

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In Hainan, China, the indigenous Li ethnic group, who have settled in the region since the Stone Age, has preserved the cultural heritage of Li Jin. This tradition involves dyeing threads, weaving, and embroidering patterns to create clothing. To effectively preserve and develop local culture, it is necessary to redesign the Li Jin patterns, thereby creating derivative products and economic value, and breathing new life into the Li Jin culture. This study focuses on analyzing four main patterns of Li Jin—human figure pattern, animal pattern, plant pattern, and geometric pattern—and aims to develop carpet pattern designs for interior decoration. Through the research, three key themes were derived: “Sustainability”, “Classical”, and “Secret”. Sustainability: Designs under this theme abstractly transformed certain elements of the human figure patterns to convey resilience. Classical: This theme delved into the frog motif among animal patterns, abstracting it deeply to express patterns in a classic and sophisticated manner. Secret: Designs under this theme combined animal, plant, and geometric patterns to convey a sense of enigma, delivering a modern interpretation of Li Jin patterns to consumers. By integrating Li Jin patterns with contemporary trends and applying them to fabric design, this study aims to meet diverse consumer needs while enhancing the competitiveness of the fabric industry in the home interior sector.

*Keywords:* Li brocade pattern, fabric design, traditional pattern, carpet design

## Introduction

### Research Background and Objectives

In Hainan, China, the indigenous Li ethnic group, who have inhabited the region since the Stone Age, has preserved a cultural tradition of dyeing threads, weaving, and embroidering patterns to create clothing. This traditional textile craft, known as Li Jin (黎锦), represents the Li people’s ancient weaving techniques. While efforts to integrate ethnic culture into modern design have been ongoing, the application of Li Jin patterns in contemporary fabric product design has progressed at a slower pace.

This study focuses on analyzing four main patterns of Li Jin—human figure pattern, animal pattern, plant pattern, and geometric pattern. Based on this analysis, it seeks to reinterpret these patterns in a modern context to effectively inherit and promote the cultural significance of the local heritage.

By extracting and analyzing these four key patterns, the study examines carpet types, manufacturing methods, and materials, ultimately developing pattern designs suitable for carpets. The goal is to present designs that not only embrace Eastern and ethnic aesthetics but also incorporate modern design language, ensuring their relevance both domestically and internationally.

Li Jin patterns have a long history and are recognized as China's earliest cotton textile craft. They document the history, culture, daily life, and religious activities of the Li people while reflecting the aesthetic concepts of various eras. Therefore, the application and innovation of Li Jin patterns symbolize the inheritance and development of China's ethnic culture. By applying the artistic beauty of Li Jin patterns to design, this study aims to preserve not only the patterns and Eastern traditional culture but also to emphasize the unique beauty of Eastern and ethnic designs on the international stage.

### **Research Methods**

This study examines the development history of Li Jin patterns based on a review of relevant literature and focuses on four main patterns of the Li ethnic group as the main research scope: human figure pattern, animal pattern, plant pattern, and geometric pattern. The characteristics of these four major patterns were analyzed. Additionally, the study investigated and analyzed the development history and evolution of Li Jin patterns.

To provide a theoretical foundation for carpet design, the study classified carpets based on their types, manufacturing methods, and materials to build foundational knowledge about carpets. Subsequently, a visualization process was undertaken to incorporate new Li Jin patterns into carpet designs. Finally, simulations of these designs were conducted in residential spaces, and the study's significance and limitations were summarized.

## **Theoretical Background**

### **Current Status and Characteristics of Traditional Li Jin Patterns**

Hainan in China and Jeju Island in South Korea share commonalities as islands located in the southernmost parts of their respective countries and as places historically used for exile. Both islands also possess unique textile craft cultures. Just as Jeju Island is known for its Gal-ot culture, Hainan has preserved a tradition where the indigenous Li ethnic group, who have lived there since the Stone Age, dyes threads, weaves patterns, and embroiders to create clothing. This traditional textile craft is known as Li Jin, referring to the Li people's weaving, dyeing, and embroidery techniques (黎族傳統紡染織繡技藝). The term "Li Jin" translates to "Li brocade", with "Li" referencing the Li people's homeland of Wuzhishan (One of the iconic mountain ranges of Hainan Island) in Hainan and "brocade" describing the fabric, which is actually cotton.

The exact origin of Li Jin patterns is unclear. However, historical records suggest that the inhabitants of Hainan Island during the Shang-Zhou period could produce cotton cloth. The cotton fabrics they created were simple yet practical and refined. By the Qin and Han dynasties, the Li people's cotton weaving had reached a certain scale. The Guangfubu (广幅布), a type of wide cotton fabric produced by the Li, was offered as tribute. As weaving techniques became increasingly sophisticated, alongside innovations in production tools, the quality of cotton fabrics improved. During this period, the jacquard weaving technique emerged, producing intricate patterns. The cotton jacquard woven fabrics came to be known as "Li Jin". The weaving industry reached its peak during the Qing dynasty, alongside the pinnacle of the Li people's textile development.

By this time, the Li people had begun interacting more frequently with the Han Chinese, engaging in trade and cultural exchange. This interaction enriched Li Jin patterns, making them more diverse and vibrant, and further enhanced their artistic and cultural value. However, by the mid-20th century, traditional Chinese handicrafts, including Li Jin, began to decline. After the establishment of the People's Republic of China, the "Four Olds Destruction Movement" targeted traditional practices, severely impacting Li Jin. Notably, the precious "Dragon Quilt" (龙被) was lost during the 1950s.

In contemporary times, the popularity of Western-style clothing and modern fashion trends has further marginalized traditional Li Jin culture. This has led to a decline in interest and a reduction in the number of practitioners carrying forward this heritage.

This study aims to address these challenges and propose strategies to preserve and revitalize the traditional culture of Li Jin.

**Human figure pattern.** Human figure patterns are among the most common designs in Li Jin patterns, as the Li people regard humans as the most significant motif. Since everything is created by humans, they are considered a sacred symbol. Human figure patterns are generally categorized into three types: frog pose human figure patterns, figurative human figure patterns, and simplified human figure patterns.

Figure 1 illustrates a frog pose human figure pattern. As the name suggests, it retains some external characteristics of a frog, such as a diamond-shaped body and limbs bent like a frog's. Some designs even include webbed feet, yet the basic human-like image remains very evident.



Figure 1. Frog pose human figure pattern (Source: Mao, 2017, p. 26).

Figure 2 illustrates a figurative human figure pattern, which builds upon the frog pose human figure pattern by more clearly showcasing human characteristics. This design not only appears closer to the image of a human but also incorporates elements such as accessories and depictions of daily production and life activities, resulting in a more complex pattern.



Figure 2. Figurative human figure pattern (Source: Mao, 2017, p. 27).

Figure 3 illustrates a simplified human figure pattern, where human characteristics are most pronounced, and frog-like traits gradually fade away. The pattern becomes simplified, with arms and legs represented by basic lines.

Among the human figure patterns, the most classic form consists of two geometric motifs resembling diamonds, arranged vertically to represent the upper and lower parts of the human body. The head is depicted as a relatively small diamond shape. The overall design is symmetrical, featuring a simple structure and exaggerated imagery.



Figure 3. Simplified human figure pattern (Source: Mao, 2017, p. 27).

**Animal patterns.** Hainan Island, with its beautiful mountains and rivers, is home to a diverse array of wildlife. The Li people have long lived in harmony with this natural environment, and these animals have been vividly recorded in Li Jin patterns. Due to the unique production techniques of the Li people, these animal patterns are often exaggerated and stylized, transforming them into decorative and artistic motifs.

The themes of animal patterns are primarily derived from the Li people's everyday life and commonly feature animals such as frogs, snakes, turtles, and birds. These patterns are simple in form, diverse in type, and carry various symbolic meanings. Below is a brief explanation of several animal patterns commonly seen in Li Jin and their significance. Frog Patterns: Frog motifs are the most widely used patterns in Li Jin. To highlight their characteristics, they are categorized into three types: figurative frog patterns, modified frog patterns, and simplified frog patterns. Figurative Frog Patterns: As the name suggests, these patterns feature highly detailed and lifelike representations of frogs. The body is diamond-shaped, the head is small, and the torso is large. The forelimbs are short, while the hind limbs are thick and powerful, with clearly defined webbed feet, creating a vivid and dynamic image (See Figure 4). Simplified Frog Patterns: These are abstracted versions of frog motifs that continue to evolve from modified frog patterns. The frog's body shape and basic posture are expressed primarily through clean, simple lines, emphasizing abstraction and artistic expression (See Figure 5).



Figure 4. Figurative frog pattern (Source: Mao, 2017, p. 30).



Figure 5. Simplified frog pattern (Source: Mao, 2017, p. 31).

Modified Frog Patterns are slightly altered versions of the original frog motifs. Based on a diamond shape, these patterns emphasize distinct features through exaggeration and modification, with a particular focus on the jumping posture and localized characteristics. Despite these changes, the overall image of the frog remains abstract (See Figure 6).



Figure 6. Modified frog pattern (Source: Jia, 2016, p. 17).

The turtle pattern (龟纹) is one of the auspicious motifs in Li Jin, symbolizing longevity and immortality. It is composed of diamond shapes and straight lines, creating a lively and dynamic impression. A distinctive feature of the turtle pattern is the tension expressed in the opening and closing movements of the turtle's legs. Additionally, the turtle's shell often features a Wan (卍) pattern design, signifying wishes for long-lasting happiness and prosperity (See Figure 7).



Figure 7. Turtle pattern (Source: Mao, 2017, p. 31).

**Plant patterns.** Plant patterns are among the most commonly used motifs in Li Jin and are often woven or embroidered alongside human figure patterns and bird motifs. Hainan Island, with its abundant sunlight, warmth, and water resources, is home to a rich variety of plant life. The Li people, who have lived on the island for generations, have drawn inspiration from the beautiful plants around them, incorporating these designs into decorative Li Jin patterns. Over time, these motifs became popular and were imbued with auspicious meanings.

Plant motifs primarily include kapok flowers (木棉花), dragon bone flowers (龙骨花), Ni Neng flowers (泥嫩花), vines (藤), and other plants like trees. Among these, the most common are kapok patterns and flower patterns. Kapok, as one of the primary raw materials for Li fabrics, holds special significance for Li women. Kapok patterns often depict kapok trees with clearly defined roots and branches, accompanied by key-shaped motifs (钥匙纹), also known as “arbitrary patterns” (任意纹), beneath the branches. Flowers and leaves are scattered around, symbolizing lush roots, abundant foliage, and a harmonious and happy family.

Another popular plant motif is the flower pattern, which is particularly prevalent around the Wuzhishan (五指山) region. This pattern typically features a long cylindrical shape that signifies the family lineage. The overall design resembles the Chinese character “巾” in reverse and includes weeds and a series of diamond-shaped patterns. It symbolizes deep roots, abundant leaves, and a prosperous and flourishing family (See Figures 8 and 9).



Figure 8. Kapok pattern (Source: Mao, 2017, p. 31).



Figure 9. Flower pattern (Source: Mao, 2017, p. 31).

**Geometric patterns.** Geometric patterns (幾何紋) are the most prominent motifs in Li Jin, reflecting the rich imagination and profound cultural significance of the Li people. According to Shen Lin (2008) in *Research on Clothing Patterns of the Chuxiong Yi Nationality and Their Modern Application*, geometric patterns refer to a general term for non-representational, rule-based designs. These patterns incorporate stylized transformations and exaggerations of natural landscapes and are composed of basic elements such as dots, lines, and planes, adhering to principles of formal aesthetics to create iconic designs.

Geometric patterns primarily consist of diamonds, triangles, zigzags, squares, grids, and other shapes, characterized by their high abstraction and symbolism. These motifs are often arranged symmetrically and repetitively, forming structured patterns with strong regularity that provide a balanced and harmonious visual experience.

The patterns on the Tungun (筒裙, traditional Chinese skirts) are predominantly geometric (Mao, 2017, p. 32). Diamonds symbolize the land and the living spaces of the Li people, emphasizing the close relationship between land and agriculture. Their repetitive and symmetrical arrangements often express aspirations for harvest and stability. Triangular patterns commonly depict mountains, symbolizing reverence for nature and associations with protection and ancestral worship. Zigzag patterns typically represent water flow or roads, reflecting the flow and continuity of life while encapsulating the Li people's thoughts on natural cycles and life's journey (See Figure 10).



Figure 10. Li Jin Tungun (traditional skirt) (Source: Mao, 2017, p. 32).

Overall, the geometric patterns in Li Jin are not only highly decorative but also encapsulate the Li people's understanding of nature, ancestry, and lifestyle, serving as an essential medium of their cultural heritage. The main characteristics of Li Jin patterns are summarized in Table 1.

Table 1

*Characteristics of Li Jin Fabric Patterns*

Category	Theme	Characteristics
Human figure patterns	Frog Pose Pattern	<ul style="list-style-type: none"> <li>• Most common pattern, symbolizing reverence for human sanctity.</li> <li>• Features bent limbs in a characteristic pose.</li> <li>• Figurative patterns depict human forms and scenes from daily life.</li> <li>• Simplified patterns abstract human outlines into simple lines.</li> </ul>
	Figurative Pattern	
	Simplified Pattern	
Animal patterns	Figurative Pattern	<ul style="list-style-type: none"> <li>• Themes include animals like frogs, snakes, turtles, and birds, characterized by simplicity and variety.</li> <li>• Divided into figurative, modified, and simplified forms, progressively transitioning to abstract expressions.</li> <li>• Turtle patterns symbolize longevity and happiness, often incorporating auspicious symbols on their shells.</li> </ul>
	Modified Pattern	
	Simplified Pattern	
	Turtle Pattern	
Plant patterns	Kapok Pattern	<ul style="list-style-type: none"> <li>• Derived from Hainan's natural resources, featuring kapok, dragon bone, and other plant patterns.</li> <li>• Kapok and floral patterns are most common, symbolizing family happiness and prosperity.</li> <li>• Forms such as branches, leaves, and vines represent the propagation of life and the beauty of nature.</li> <li>• Reflects the harmonious relationship between the Li people and nature.</li> </ul>
	Floral Pattern	
Geometric patterns	Diamond	<ul style="list-style-type: none"> <li>• Iconic patterns characterized by abstraction and symbolism.</li> <li>• Includes diamonds, triangles, and zigzags.</li> <li>• Reflects reverence for natural elements such as land, mountains, and rivers.</li> <li>• Diamonds symbolize land and harvest, triangles represent mountains and protection, and zigzags signify the continuity of life and water.</li> </ul>
	Triangle	
	Zigzag	

**Current Status and Future of Fabric Design**

The current state of fabric design can be summarized into four key aspects: sustainability, advancements in digital technology, smart textiles, and cultural diversity. This study integrates these four perspectives to derive its design approach.

(1) Sustainability: As consumers increasingly pursue eco-friendly and ethical consumption, sustainable materials such as recycled fibers, organic cotton, and bamboo fibers have become widely used. Particularly in the fashion industry, there is a growing adoption of recyclable fabrics and vegan materials to reduce carbon footprints.

(2) Advancements in Digital Technology: Digital printing has become a preferred choice over traditional methods due to its cost efficiency and ability to quickly create diverse patterns and colors. It is now widely utilized by small brands and large fashion houses alike. This technology enables personalized and customized designs, making it easier to meet consumer demands. Additionally, advancements in virtual simulation allow designers to preview the texture and patterns of fabrics before production, enhancing precision and reducing waste.

(3) Smart Textiles: Smart textiles incorporate electronic fibers (E-textiles) to enable wearable technologies, such as health monitoring and fitness tracking. Functional materials offering waterproofing, UV protection, and antibacterial properties are also being utilized, increasing practicality and convenience in fields like healthcare, sports, and fashion.

(4) Cultural Diversity: Efforts to reinterpret global cultures and traditional patterns in modern ways are thriving. Traditional motifs and craft techniques from around the world are being integrated into contemporary fabric designs, reflecting unique cultural elements from various regions. This cultural diversity is applied in fields like fashion, interior design, and furniture, blending modern aesthetics with traditional artistry.

The future of fabric design will see revolutionary progress through the convergence of sustainability, digital technology, smart textiles, and cultural diversity. As eco-friendly materials and ethical production methods gain prominence, nanotechnology and biodegradable fibers will become increasingly significant. Digital printing and virtual simulation will expand the scope of customized design, while smart textiles integrated with wearable devices will find applications across various industries. Designs incorporating global cultural elements are likely to dominate the international market. In conclusion, fabric design will evolve in a sustainable and innovative direction, harmonizing environmental consciousness, technological advancements, and cultural appreciation.

### **General Review of Carpets**

This study references recent research to analyze the history, current status, types, and manufacturing methods of carpets. Specifically, the work of Wei Yuqing and Eom Kyoung-hee (2023) was utilized for insights into the design history and status of carpets. For material analysis, the study referenced Li Junyu's research (2019), combining these findings with online resources to draw conclusions.

#### **History and Current Status of Carpet Design**

The history of carpets dates back to ancient times, first appearing in the 4th century BCE in ancient Egypt. Early carpets were typically woven from natural fibers such as palm leaves and grasses and were used as floor coverings and wall decorations. Over time, carpet production techniques advanced with the continual improvement of hand-weaving and textile methods. By the Middle Ages, carpets became luxury items among European and Asian aristocracy, frequently used to decorate palaces and noble residences. As trade expanded, carpets were introduced to Europe, where they gained popularity in Western society.

The advent of the Industrial Revolution modernized carpet manufacturing, with the invention of looms significantly reducing production costs. This democratized carpets, making them accessible decorative items for homes and businesses alike. In the early 20th century, modern design concepts and advancements in material technology introduced new ideas and diversity to carpet design. Carpets evolved from being purely functional items to artistic pieces and design elements widely used in residential and commercial spaces, shaping diverse markets. Today, carpets reflect styles and traditions from various regions and eras, becoming a part of global culture.

Currently, carpets demonstrate comprehensive innovation and integration across various aspects, including design styles, material selection, processing techniques, functional applications, and cultural expression. Design Styles: Traditional geometric patterns, floral motifs, and ethnic styles are blended with modern elements such as abstract art, minimalism, and urban aesthetics. Designers emphasize compatibility with interior spaces and personalized customization through complex color schemes, dynamic graphic designs, and meticulous spatial arrangements, creating strong visual impact and unique decorative effects. Materials: Environmental protection and sustainability have become core design concepts. Natural materials such as wool, silk, hemp, and bamboo fibers, along with recycled synthetic fibers, are increasingly replacing traditional chemical fibers. Innovative technologies such as 3D printing, digital printing, hand-knotting, and laser cutting are used to achieve



unprecedented refinement in texture, color depth, and tactile quality. **Functionality:** Carpets have transitioned from simple decorative items to multifunctional products. Features such as antibacterial, stain-resistant, fireproof, waterproof, and noise-reducing properties are increasingly common. Smart carpets are emerging, particularly in public and high-traffic areas, integrating built-in sensors to detect environmental changes, monitor room temperatures, or connect with smart home devices for enhanced convenience and interactivity.

**Cultural Expression:** Carpet design is becoming increasingly globalized. Designers incorporate cultural symbols and traditional techniques from various regions into modern designs, making carpets a medium for expressing ethnic culture, regional characteristics, and even artistic spirit. This transformation elevates carpets from functional household items to art pieces and cultural symbols, reflecting diverse market developments and enhanced aesthetic value worldwide.

### Consideration of Carpet Types

Carpets can be categorized into four main types based on their production and characteristics: handmade carpets, machine-made carpets, tile carpets (block carpets), and plush and short-pile carpets.

**Handmade Carpets:** Representing the luxury market, these are crafted by artisans using traditional techniques involving hand weaving and knotting. The intricate production process is time-consuming, with examples including Persian and Oriental carpets. These carpets are highly valued for their artistic appeal, featuring complex patterns and exquisite craftsmanship, making them beloved by collectors and high-end users.

**Machine-Made Carpets:** Produced in bulk using modern machinery, they are primarily used in commercial or public spaces. They offer fast production and a wide variety of designs to meet large-scale demand. Notable examples include Wilton Carpets and Axminster Carpets, which are created using complex mechanical weaving techniques. These carpets are ideal for high-traffic areas such as hotels and theaters.

**Tile Carpets:** Modular carpets typically composed of square or rectangular units, making installation and replacement easy. They are commonly used in offices, conference rooms, and commercial spaces, offering high flexibility and allowing for creative designs through combinations of various colors and patterns.

**Plush Carpets:** Featuring long, soft surface fibers, these carpets provide a luxurious and comfortable feel, making them suitable for spaces like bedrooms and living rooms where comfort is a priority.

**Short-Pile Carpets (Berber Carpets):** These have short, dense fiber structures that offer exceptional durability, making them ideal for high-traffic areas such as hallways and entrances. The primary types of carpets are summarized in Table 2.

Table 2

#### *Main Types of Carpets*

Type	Characteristics	Application areas
Handmade Carpets	Crafted by hand using traditional techniques of weaving and knotting. High artistic value with intricate patterns and exquisite craftsmanship.	Luxury residences, hotels, commercial spaces, cultural and religious spaces
Machine-Made Carpets	Fast production with a variety of designs. Meets large-scale demand. Includes Wilton Carpets and Axminster Carpets.	High-end hotels, theaters
Tile Carpets (Block Carpets)	Composed of square or rectangular units. High flexibility, allowing personalized designs with various color and pattern combinations.	Offices, conference rooms, commercial spaces
Plush Carpets	Long, soft surface fibers providing a luxurious and comfortable feel.	Bedrooms, living rooms
Short-Pile Carpets	Short, dense fiber structures offering high durability.	Hallways, entrances

### Carpet Production Methods

Modern carpet production can be categorized into four main methods: hand weaving, machine weaving, tufting, and needle punching. Hand Weaving: This highly intricate and complex process is primarily used for luxury and artistic carpets. It includes knotting techniques (Persian and Turkish knots) and weaving methods. Artisans weave fibers into the base fabric by hand, creating detailed patterns and textures. The denser the knots, the higher the quality of the carpet. Wilton Weaving and Axminster Weaving: These are two prominent techniques used in machine-made carpets. Wilton carpets are woven using a complex warp and weft system, featuring elaborate patterns and thick textures. Axminster carpets use a horizontal weft system to produce precise, colorful patterns, making them ideal for installations in luxury hotels and theaters. Tufting Process: This is currently the most widely used method for carpet production. It involves inserting fibers into a base fabric with needles, then cutting and securing them at a uniform height. Tufted carpets are fast to produce, relatively cost-effective, and versatile, making them suitable for both residential and commercial use. Needle Punching: This method is mainly used for industrial and commercial carpets. It involves punching fibers through a base material to create durable and resilient carpets, often used in offices, airports, and other high-traffic areas. The production methods for carpets are summarized in Table 3.

Table 3

#### *Representative Carpet Production Methods*

Type	Production method	Application areas
Handmade	Artisans manually weave fibers into the base fabric, creating intricate patterns and textures.	Luxury residences, hotels, commercial spaces, cultural and religious venues
Machine Weaving	Wilton Weave: Woven using a complex warp and weft system.	High-end hotels, theaters
	Axminster Weave: Uses horizontally stretched weft to create precise, colorful patterns.	
Tufting	Fibers are inserted into the base fabric with needles, then cut and secured at a uniform height.	Residential and commercial spaces
Needle Punching	Short fibers are punched into the base fabric using high-speed needle punching machines, creating durable carpets.	Offices, airports, and other high-traffic areas

### Consideration of Carpet Materials

Carpet materials can be divided into three main categories: natural fibers, synthetic fibers, and blended fibers.

Natural Fibers: Wool: One of the finest natural fibers, known for its excellent elasticity, durability, and natural stain resistance. Cotton: Lightweight, soft, eco-friendly, and highly absorbent, making it suitable for thin carpets. Jute: Strong and durable, ideal for outdoor spaces such as balconies and gardens. Silk: Renowned for its unique sheen and luxurious texture, primarily used in high-end decorative carpets.

Synthetic Fibers: Nylon: The most widely used synthetic fiber, known for its exceptional durability, stain resistance, and elasticity. Polypropylene: Offers excellent stain resistance and moisture protection, making it suitable for outdoor or humid environments, and is cost-effective. Polyester: Soft, glossy, and highly stain-resistant, ideal for aesthetic appeal. Acrylic: Provides a wool-like soft feel, is economical, and resists fading.

Blended Fibers: Blended fibers combine the strengths of natural and synthetic fibers, providing a balance of performance, durability, and aesthetics. These materials cater to both the high durability required in commercial spaces and the comfort desired in residential settings. The types of carpet materials are summarized in Table 4.

Table 4

*Analysis of Three Representative Carpet Materials*

Material	Characteristics	Application Areas
Natural Fibers	Wool: Elastic, durable, naturally stain-resistant.	Luxury homes, commercial environments
	Cotton: Lightweight, soft, eco-friendly, and absorbent.	Decorations, temporary spaces
	Jute: Durable and sturdy.	Outdoor and semi-outdoor areas
	Silk: Glossy and luxurious.	Ornamental use, low-traffic areas
Synthetic Fibers	Nylon: Durable, stain-resistant, and elastic.	High-end hotels, theaters
	Polypropylene: Stain-resistant, moisture-proof, and economical.	Outdoor and humid environments
	Polyester: Soft, glossy, and stain-resistant.	Residential spaces
Blended Fibers	Acrylic: Wool-like softness, economical, and stain-resistant.	Residential spaces, children's rooms, leisure areas
	Combines high durability for commercial use with comfort for residential use.	Commercial environments, homes, educational institutions, public spaces

### Research on Carpet Design Development Using Li Jin Patterns

#### Design Concept

Based on traditional Li Jin patterns, this study integrates the characteristics of the four main motifs—human figure patterns, animal patterns, plant patterns, and geometric patterns—with modern design techniques to create new carpets for home interiors. The proposed designs aim to preserve the legacy of traditional Chinese patterns while meeting the needs of contemporary consumers and adapting them for modern home decor.

#### Sustainability

The theme of the carpet design based on Li Jin human figure patterns is “Sustainability”. The Li people regard humans as the most significant motif, as they believe everything in the world is created by humans, making humanity a sacred symbol. In modern society, despite significant pressures, people continue to harbor a deep desire for a fulfilling life, supporting themselves with resilience and determination. In this design, elements of simplified and figurative human figure patterns from Li Jin are preserved. Four primary human motifs were abstracted, transformed, and evolved to create new patterns. Design techniques such as repetition, symmetry, and arrangement were employed to express visual order and rhythm, creating a dynamic and harmonious composition. The interconnection of human motifs placed symmetrically around the design conveys the theme of sustainability and the spirit of continuous cultural inheritance. The color palette features a modern and sophisticated blue-gray tone as the base, with orange accents adding a touch of contemporary aesthetic sensibility. The material chosen for the carpet is wool, renowned for its excellent elasticity, durability, and natural stain resistance, enhancing the elegance and functionality of living spaces. The carpet is designed with dimensions of 180 cm × 200 cm and has been visualized in residential spaces to effectively express the “Sustainability” theme. Table 5 summarizes the design’s key features.

#### Classical

The theme of the carpet design based on the frog motif of Li Jin animal patterns is “Classical”. For generations, the Li people have lived in Hainan alongside animals, drawing inspiration from this coexistence to create motifs. Due to their unique production processes, the Li people exaggerated these animal patterns, transforming them into artistic and decorative designs. In this design, three types of frog motifs were abstractly transformed and flexibly utilized to create a new design. A symmetrical structure was employed to convey a strong sense of form. The overall design is based on diamonds with exaggerated modifications, and different

patterns were spaced apart to create a strong sense of rhythm. Repetition, consistent variation, and irregular changes in the motifs maintain coherence throughout the design. A brown color palette was chosen to enhance the classic feel of the design, with accents of orange and ochre to avoid monotony. The intention is to reflect on the classics of the past in the rapidly changing modern world and provide a sense of comfort to the mind. The material used is cotton, which is lightweight, soft, eco-friendly, and highly absorbent, making it suitable for decorative spaces. The carpet design was created with dimensions of 180 cm × 240 cm and was visualized in living spaces to embody the “Classical” theme. Table 6 summarizes the key features of this design.

Table 5  
 “Sustainability” Carpet Design










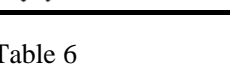








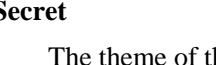
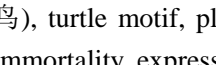
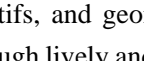
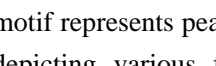
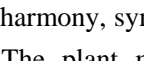
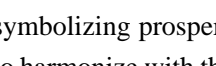
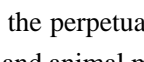
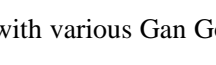
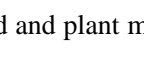
Design	Color	Design
	 PANTONE 14-4315TPG	
	 PANTONE 17-4724TPG	
	 PANTONE 15-4715TPG	
	 PANTONE 12-5302TPG	
	 PANTONE 16-1150TPG	

Table 6  
 “Classical” Carpet Design

Design	Color	Design
	 PANTONE 11-0105TPG	
		
		
		
		
		
	 PANTONE 17-4724TPG	
	 PANTONE 16-1348TPG	
	 PANTONE 19-1541TPG	
	 PANTONE 18-1355TPG	






**Secret**

The theme of the carpet design based on Li Jin traditional motifs, including the Gan Gong bird motif (甘工鸟), turtle motif, plant motifs, and geometric motifs, is “Secret”. The turtle motif symbolizes longevity and immortality, expressed through lively and intriguing forms using diamonds and straight lines. The Gan Gong bird motif represents peace and harmony, symbolizing unity. This motif was utilized in the design with simple lines depicting various forms. The plant motif incorporates continuous floral patterns and diamond shapes, symbolizing prosperity and the perpetuation of generations. Geometric motifs were exaggerated and abstracted to harmonize with the plant and animal motifs. The design centers on a geometric floral motif, radiating outward, with various Gan Gong bird and plant motifs interwoven around it to enhance the central visual effect. Flowers

were added to the four corners to increase the structural stability of the design. The color palette is based on mysterious teal tones, combined with gray, green, and other hues to create a cool color scheme. This provides a tranquil and calming atmosphere in residential spaces, effectively reducing stress. The material used is blended fibers, offering both high durability for commercial environments and comfort for residential settings. This design is suitable for high-traffic commercial spaces as well as home environments. The carpet design dimensions are 180 cm × 240 cm, and the design, centered on the “Secret” theme, was visualized in living spaces to enhance its conceptual expression. Table 7 summarizes the key features of this design.

Table 7

*“Secret” Carpet Design*

Design	Color	Design
 	 PANTONE 14-1307TPG PANTONE 17-5430TPG PANTONE 19-3953TPG PANTONE 15-5220TPG PANTONE 18-1450TP PANTONE 18-4143TPG PANTONE 19-4111TPG	 

### Conclusion

Li Jin patterns are a cultural heritage of the Li people in Hainan, China, dating back to the Stone Age. These patterns originated from the Li people’s tradition of dyeing threads and weaving or embroidering motifs into fabrics for clothing. Through observation, interaction, and emotional experience, the Li people have created auspicious and richly imaginative patterns using methods such as generalization, exaggeration, association, and beautification. To ensure the continuation of this tradition, this study aims to infuse vitality into Li Jin patterns, making them widely relevant to modern consumers. This research analyzed the four main Li Jin motifs—human figure, animal, plant, and geometric patterns—and examined carpet types, production methods, and materials. By combining these insights with modern trends, the study developed abstract, geometric, and linear surface fabric designs for interiors. The conclusions are as follows: Sustainability Theme: Based on Li Jin human figure patterns, the theme emphasizes sustainability, reflecting the belief that every person is their own foundation. Despite pressures in modern society, people harbor a longing for a fulfilling life. The design incorporates techniques like repetition, symmetry, and arrangement to convey visual order and rhythm. A blue-gray palette with orange accents lends a contemporary aesthetic. Wool was chosen as the material for its elasticity, durability, and natural stain resistance, enhancing the elegance of living spaces. Classical Theme: Inspired by the frog motif in Li Jin animal patterns, this theme captures the classical spirit. The Li people have long coexisted with animals, and their distinctive production processes have exaggerated animal motifs into artistic, decorative designs. Frog motifs were abstracted and symmetrically arranged to create a dynamic and classical feel. The design uses brown tones with orange and ochre accents to avoid monotony. Cotton was selected for its lightness, softness, eco-friendliness, and moisture absorption, making it suitable for decorative spaces. Secret Theme: Drawing from the Gan Gong bird motif, turtle motif, plant motifs, and geometric motifs, this theme combines these elements to

represent mystery. Geometric patterns are exaggerated and abstracted to harmonize with plant and animal motifs. A central geometric floral pattern radiates outward, with intersecting Gan Gong bird and plant motifs enhancing the visual impact. Flowers in the four corners add structural stability. A teal color palette with gray and green accents creates a calm and cool aesthetic, offering a tranquil environment to reduce stress. Blended fibers were chosen for their durability in commercial spaces and comfort in residential settings. This design is ideal for high-traffic areas such as commercial spaces and homes. In conclusion, integrating Li Jin patterns with modern design trends can meet diverse consumer needs in fabric design for home interiors. This harmonious fusion of traditional motifs and contemporary aesthetics also promotes cultural exchange between nations and enhances the competitiveness of the home fabric industry. Future research should explore the synergy between diverse cultural elements and the latest design trends to develop solutions that cater to a broader range of consumer expectations.

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