# Multi-dimensional Creation of Artistic Atmosphere of Soft Decoration under the Technology Empowerment: Practice of Intelligent Matching and Personalized Design

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**Abstract:** Driven by dual forces of consumption upgrading and technological evolution, interior design has transitioned from traditional style replication to an emotionally and personally-driven approach centered on user needs. Technological empowerment has created innovative pathways for crafting artistic atmospheres in soft furnishings. Intelligent matching systems effectively bridge the information gap between design resources and user requirements, while personalized design practices enable spaces to better align with residents' lifestyle needs and emotional expressions. This article examines the core logic and implementation strategies of intelligent matching through practical soft furnishing design scenarios. By analyzing residential and commercial space cases, it demonstrates how technology achieves multi-dimensional synergy through color, material, and lighting to precisely create artistic atmospheres. The study also reflects on the boundaries of technological application concepts, providing practical references for innovation in the soft furnishing design industry.
***Keywords*:** technology empowerment; soft furnishing design; intelligent matching; personalized design; artistic ambiance creation

## 1. Introduction

As human needs for living and functional spaces evolve from basic functionality to spiritual experiences, interior design has become a pivotal medium for creating ambiance and conveying life's aesthetic essence. Traditional soft furnishing design, however, often relies on designers' experience and historical patterns, resulting in homogenized styles, poor demand alignment, and lengthy development cycles—factors that hinder modern users' pursuit of personalized and diverse spatial experiences. The integration of AI, AR virtual simulation, and smart control technologies has revitalized the field. These innovations not only enable efficient resource-user matching through intelligent matching systems but also break down professional barriers with personalized design tools, enhancing spatial ambiance creation with precision and flexibility. Grounded in technological empowerment and contemporary context, this article focuses on two core aspects: intelligent matching and personalized design. By analyzing real-world design scenarios, it explores multidimensional approaches to creating artistic ambiance in interior design, demonstrating how technology can seamlessly integrate spatial aesthetics with user experience.

## 2. Core Changes in Soft Decoration Design Through Technological Empowerment

Technology empowers soft furnishing design not merely as a tool upgrade, but as a paradigm shift in design logic, service models, and value expression. Traditional soft furnishing design was predominantly designer-led, with users often passively receiving outcomes that prioritized aesthetics over practical needs. Through technological integration, the design process now forms a closed-loop system: "precise requirement capture → intelligent resource matching → dynamic solution optimization → scenario-based implementation." This approach enhances design efficiency while ensuring artistic ambiance aligns with spatial functionality and user expectations, achieving harmony between aesthetic and practical values [2].

### 2.1 Moderate Transfer of Design Leadership

The technology has successfully broken designers 'monopoly on professional resources, transforming users from passive observers into active participants in design. Through the intelligent design platform, users can input specific spatial dimensions, general style preferences, and functional requirements according to their preferences. The system automatically generates preliminary design proposals, while users can adjust soft furnishing elements through simple drag-and-drop or replacement operations, enabling personalized optimization of the design. This shift in control does not diminish designers' value but allows them to focus on creative guidance for atmosphere creation and meticulous detail refinement, rather than basic coordination tasks. This establishes a collaborative design model combining "user participation and designer leadership," making soft furnishing solutions more practical and warm-hearted [3].

### 2.2 Dynamic Upgrade of Atmosphere Creation

Once the ambiance of traditional soft furnishings is set, subsequent adjustments become costly and challenging, making it difficult to adapt to users' changing needs across different scenarios. The application of intelligent control technology enables dynamic adjustment of soft furnishings. By integrating smart elements like lighting, curtains, and audio-visual equipment, it allows one-click switching between various scene modes [4]. For instance, a residential living room can switch to a bright and airy daily mode during the day, adjust to a soft and serene leisure mode at night, and transform into a lively and enthusiastic social mode for gatherings. This real-time adaptation of spatial ambiance enhances both adaptability and user experience.

### 2.3 Precision Implementation of Supply-Demand Matching

In traditional soft furnishing design, the alignment between user needs and individual pieces often relies on designers 'subjective judgments, frequently resulting in issues like "incompatible aesthetics" or "misaligned functionality." The intelligent matching system addresses this by digitally analyzing user requirements and categorizing soft furnishing resources through tagging. It precisely matches supply with demand by filtering suitable items based on users' lifestyle habits, aesthetic preferences, and spatial functions, while avoiding style conflicts and size mismatches. This approach enhances the feasibility of design proposals and reduces the cost of subsequent modifications.

## 3. Intelligent Matching: The Precise Path to Soft Furnishing Atmosphere Creation

### 3.1 Core Logic of Intelligent Matching: Synergy Between Tagging and Algorithms

Tagging serves as the foundational condition for intelligent matching, requiring dual-tag decomposition of user needs and soft furnishing resources. User demand tags encompass spatial types, functional requirements, style preferences, and emotional tendencies—for instance, "residential bedroom—sleep priority—minimalist style—warm and soft"; while soft furnishing resource tags include item types, color attributes, material textures, style positioning, and suitable scenarios, such as "linen curtains—light gray—matte texture—minimalist style—bedroom/living room". The algorithm model compares and analyzes these two types of tags to screen high-matching soft furnishing combinations, while optimizing solutions by considering spatial dimensions and color coordination principles to ensure both rationality and aesthetic appeal [5]. This collaborative tagging logic not only prevents designers' subjective biases but also enables rapid responses to personalized user needs. For example, for users with a preference for traditional culture, the system automatically matches soft furnishing items featuring Chinese elements like embroidered cushions, ink-wash paintings, and solid wood furniture, while coordinating colors and materials to create a space atmosphere that blends traditional charm with modern comfort. This eliminates the need for users to manually select items, significantly improving design efficiency.

### 3.2 Implementation scenarios of intelligent matching: From solution generation to implementation optimization

Smart matching technology permeates the entire soft furnishing design process, from initial concept development to final implementation and optimization, forming a complete service chain. During the conceptual phase, users input basic information through an intelligent platform, enabling the system to generate multiple differentiated proposals within seconds. This allows users to intuitively compare ambiance effects across options and quickly identify preferred styles. In the adjustment phase, the system supports real-time replacement of individual soft furnishing items and parameter adjustments—such as changing curtain colors or repositioning furniture—while simultaneously optimizing overall coordination to ensure harmonious ambiance. During the validation phase, AR virtual simulation technology projects design proposals into physical spaces, allowing users to visually assess how soft furnishing ambiance integrates with actual environments. This preemptively addresses potential visual incongruities, ensuring designs better align with real-world scenarios.

Using commercial space cafe design as an example, the intelligent matching system identifies cafe positioning (e.g., artistic freshness, light luxury, or minimalist), target demographics (e.g., young adults or business professionals), and functional zones (e.g., dining or relaxation areas) to recommend tailored soft furnishings. For artistic cafes, the system prioritizes natural wood furniture, greenery, and linen textiles, using low-saturation tones like beige, pale green, and light blue to create a natural, comfortable ambiance. For business-oriented cafes, it pairs minimalist metallic furniture with neutral-toned decor and soft spotlights to foster a tranquil yet efficient communication environment, achieving precise atmosphere positioning.

### 3.3 Limitations and Optimization Directions of Intelligent Matching

Current AI-driven matching systems still face limitations. For instance, the existing tagging framework struggles to address all personalized needs, particularly emotional or unique requests like "feeling nostalgic for childhood" or "aligning

with family ambiance." These nuances often fail to be accurately digitized, resulting in solutions that lack human touch. Moreover, most algorithm models rely on existing design experience for training, leading to repetitive matching patterns and hindering innovation beyond traditional design frameworks.

To address this scenario, optimization can be approached through two key strategies. First, expand the tag system by adding emotion-driven and context-specific labels, while enabling users to customize tags for more precise needs. Second, leverage designers' expertise to enhance the algorithm by incorporating the logic of successful design cases into the model, while maintaining manual intervention channels. This allows designers to adjust algorithmic recommendations based on actual requirements, balancing technical precision with creative design elements to ensure matching solutions are both practical and distinctive.

# 4. Personalized Design Practice: Multi-dimensional Creation Path of Soft Furnishing Atmosphere

## 4.1 Color Personalization: Dynamic Adaptation Oriented by Emotion

Color serves as the cornerstone of soft furnishing ambiance, directly influencing human emotions and spatial experiences. Technology-driven color customization transcends traditional fixed color schemes, enabling dynamic emotional adaptation. The smart dimming system allows precise adjustments to color temperature, brightness, and hue to match different moods and scenarios. For instance, warm yellow lighting creates a cozy and tranquil sleep environment, while soft blue tones help alleviate anxiety and soothe emotions, allowing users to switch freely based on their state. Meanwhile, variable-color soft furnishings (such as smart curtains and color-changing murals) enable flexible adjustment of the space's dominant color scheme. When paired with fixed-color furniture, this creates a richly layered and dynamic color system.

In personalized design, color coordination must balance user preferences with spatial functionality. For families with children, the living room can adopt soft pastel tones as the base, complemented by color-changing ambient lighting and vibrant soft furnishings (e.g., colorful cushions, cartoon-style carpets). This approach not only satisfies children's aesthetic preferences but also allows for versatile scene creation through color adjustments. For young singles' apartments, neutral tones serve as the foundation, paired with smart color-changing light strips. These strips switch to cool tones at night to create a serene atmosphere for solitude, while transitioning to warm tones during visits to enhance social interaction, thus adapting to diverse scenarios for solo living.

## 4.2 Material Personalization: Dual Adaptation of Texture and Function

Materials fundamentally determine the tactile experience and visual texture of soft furnishings, serving as a crucial medium for creating spatial ambiance. When empowered by technology, material personalization focuses on achieving precise texture expression and functional alignment, while enhancing spatial depth through strategic material combinations. The intelligent matching system recommends suitable material components based on users' tactile preferences (e.g., soft, firm, or delicate) and functional requirements (e.g., wear-resistant, easy-to-clean, or breathable), while optimizing material combinations according to style positioning to prevent texture conflicts.

In practical design, material selection should harmonize with spatial context and user preferences. For residential bedrooms, prioritize breathable fabrics like cotton, linen, and silk, paired with natural wood and fabric furnishings to create a soothing sleep environment. Kitchens and dining areas require durable, easy-to-clean materials such as leather and stone, balancing functionality with aesthetic appeal. For pet-friendly homes, the system recommends waterproof and scratch-resistant materials, complemented by soft furnishings to achieve a warm yet practical feel. Additionally, intelligent material simulation technology allows users to visualize tactile and visual effects during the design phase, helping avoid material selection errors.

## 4.3 Personalization of Light and Shadow: Atmosphere of Scene Narrative

Light and shadow serve as the "invisible brush" in soft furnishing atmosphere creation. Through variations in brightness, warmth, and spatial perception, they shape spatial hierarchy and convey emotional narratives. When empowered by technology, personalized lighting design centers on intelligent control to deeply integrate illumination with scenes and emotions, making light a vital component of spatial storytelling. Smart lighting systems enable precise adjustments tailored to specific scenarios: living room reading areas require bright and even illumination, while relaxation zones demand soft, hazy lighting. Decorative spaces can highlight soft furnishings' textures through targeted spotlights. Different spatial types require distinct lighting design priorities. In hotel guest rooms, lighting solutions must accommodate multiple functions including rest, reading, and work. Bedside smart control panels allow seamless mode switching—automatically adjusting to

low-brightness night lights during sleep mode to avoid disturbing sleep while meeting bathroom needs, or integrating local cultural elements into lighting designs for homestay spaces. Similar to traditional Chinese homestays, these spaces utilize smart lighting designed to mimic lanterns, paired with warm yellow illumination and soft wooden furnishings, to recreate the cozy ambiance of traditional dwellings. In commercial exhibition halls, dynamic light and shadow effects from intelligent systems guide visitors 'gaze, highlighting the exhibits' unique features while creating an immersive viewing experience.

### 4.4 Scenario-based Personalization: Integration of Function and Emotion

The essence of personalized soft furnishing lies in its application within specific scenarios, where functionality and emotion converge. Technological advancements have made scenario-based customization more achievable. By coordinating smart soft furnishing elements, one can craft bespoke experiential settings. For instance, a "Work Mode" adapts to remote work needs—simply press a button to brighten desk lights, lower curtains, and switch to soothing background music, creating a focused and productive environment. Similarly, a "Family Mode" caters to parent-child bonding: soft warm lighting, open curtains for natural light, and child-friendly furnishings in play areas foster a warm and interactive atmosphere.

Contextualized personalized design demands a deep understanding of users' lifestyle habits and emotional needs, moving beyond mere technical formalism. For elderly users, the design should prioritize convenience and comfort: smart home devices must be intuitive, lighting should be dimmed to prevent glare, and materials should be soft and non-slip. For younger demographics, trend-driven and interactive elements are key—smart murals that dynamically change scenes, or lighting and music synchronized to create a party vibe—can effectively cater to their individuality and social needs.

## 5. Reflection and Prospect of Soft Decoration Design under the Empowerment of Technology

### 5.1 Boundaries of Technology Application: Avoiding Over-Tooling

Technology has become a powerful tool for interior design, yet over-reliance on it risks reducing design to mere functionality. This approach often strips designs of human warmth and creative individuality. Some designs obsess over technical features while neglecting users 'emotional needs and the aesthetic essence of spaces, turning soft furnishings into showcases of technology that lose their home-like warmth and uniqueness. Therefore, in design practice, it's crucial to recognize technology's service-oriented role—supporting creativity and meeting functional demands. By balancing technical precision with design artistry, we can avoid homogenized and sterile design expressions.

Meanwhile, it is crucial to prioritize user engagement and experience, avoiding accessibility barriers caused by technical limitations. Smart home automation products should feature intuitive operation and easy-to-understand design. Design adjustments must be flexible and user-friendly, ensuring that people of all ages and technical proficiency levels can benefit from technological convenience. This approach truly embodies the original design philosophy of 'technology serving people.'

### 5.2 Industry Development Outlook: Synergy of Personalization and Standardization

In the coming years, empowered by technological advancements, interior design will evolve toward a synergy of personalization and standardization. AI and big data technologies will continuously refine intelligent matching systems, enabling more precise customization that captures users' latent needs to craft bespoke spatial atmospheres. Meanwhile, the trend toward intelligent and modular soft furnishings will drive standardized production, reducing costs and making technology-enhanced interior design accessible to more households.

Meanwhile, designers are evolving beyond their traditional role as mere styling specialists into creative visionaries who craft atmospheres and build emotional connections. They must master technical tools while preserving design's humanistic essence, blending technology with creativity to create spaces that fulfill functional needs while conveying life's aesthetic and emotional values. Furthermore, the industry needs to establish comprehensive technical standards that balance design innovation with user experience, steering the soft furnishing design sector toward healthier and more sustainable development.

## 6. Conclusion

The integration of technology has revolutionized the creation of artistic ambiance in interior design. Intelligent matching systems precisely connect user needs with available resources, providing efficient support for personalized design. Practical applications of color, material, and lighting customization further enhance spatial atmospheres to align with users' requirements and emotional needs. The true value of technology lies not in its tools themselves, but in breaking traditional design constraints through technological means. This enables a deep fusion of aesthetics, functionality, and emotion, creating

soft furnishings that are both distinctive and warm, grounded in everyday life. Amid rapid technological iterations, interior design must adhere to the core principle of "human-centered design," balancing technical precision with artistic creativity to avoid excessive tooling and homogenization.

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