

AI-Assisted Landscape Design Optimization and Innovation Research based on AI Assistance

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Abstract: - Urban fashion landscape, as an important carrier of urban image communication, is an important content of enhancing urban cultural ecology and promoting the construction of urban cultural tourism. As AI painting is widely involved in design as a tool, AI painting can play a role in urban fashion landscape design, especially in establishing the connection between regional cultural characteristics and fashion to create new creative possibilities. Through literature collation and case analysis of existing design typical cases, the original process of urban fashion landscape design is clarified, AI painting is used for design practice, and the participation of AI painting in urban fashion landscape design is evaluated, to provide innovative design ideas for fashion landscape designers.

Key-Words: - artificial intelligence; landscape design; optimization; innovation; design strategy; Urban Cultural Identity; Creative Fusion; Digital Artistry.

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1 Introduction

The urban fashion landscape is an important carrier to show the regional cultural image, and it is also an important content of art participation in urban public space to meet people's growing needs for a better life and increase people's happiness. Fashion landscape is not only reflected in the bearing of regional characteristics of culture but also an important form of fashion transformation.

Today, AI painting has been widely used in the field of commercial design, especially in the design of shared urban fashion landscapes. As a novel design creation tool, AI painting can use text to generate images or images to generate images and other ways to provide designers with a lot of design inspiration and improve design efficiency.

The subsequent sections of this paper are intricately interlinked and build upon each other to comprehensively address the role of AI painting in urban fashion landscape design. Section 2 delves into the scope and concept of the fashion landscape, underscoring its cultural, social, and aesthetic dimensions. This foundational understanding sets the stage for exploring how AI painting can contribute to the design process. Section 3 provides an overview of AI painting, elucidating its principles, application fields, and design process. This section establishes the technological

framework within which AI painting operates and its potential in design practices.

Subsequently, Section 4 showcases typical cases of AI-assisted landscape design, particularly focusing on festival fashion landscapes. Through historical analysis and case studies, this section demonstrates how AI painting can bridge the gap between traditional cultural elements and modern design practices, thus reinforcing the relevance and feasibility of AI participation in fashion landscape design with special ethnic and regional cultural characteristics. The cases analyzed highlight not only the technical capabilities of AI painting but also its ability to capture and convey cultural nuances, reinforcing the link between AI technology and cultural heritage preservation.

However, in the design of fashion landscapes with national culture and regional typical cultural characteristics, especially the fashion landscape design with festival content, can the use of AI painting tools participate in the design process to meet the need for people to feel the fashion culture from The Times and appreciate the essence of traditional culture in the fashion landscape? It is the key issue of using new technological tools to participate in the design of the fashion landscape with national cultural content.

Based on this problem, this paper makes a practical attempt to design by using AI painting technology to generate images from text. Through the participation of new technology in the practice of fashion landscape design with regional humanistic and artistic characteristics, the feasibility of AI participation in fashion landscape design with special ethnic regional cultural characteristics is further discussed, and through the analysis of the advantages and disadvantages of the design results, more design expansion possibilities are provided for the shaping of the regional characteristic image of the fashion landscape.

2 The Scope and Concept of Fashion Landscape Analysis

Landscape exists in the public space, in addition to its own natural properties, but also has cultural ideology, become a prop in the space and a symbol in the society. In the book, [1], it is argued that landscape does not simply refer to landscape, but is a representation of socio-cultural ideology. In other words, in addition to practical and beautifying functions, it also has a metaphysical cultural representation. Fashion landscape is the expression of cultural symbols and symbols, reflecting the urban community's choice and identification of culture, and reflecting shared values, [2]. The fashion landscape not only has social and cultural attributes but also has popularity, which can attract specific audiences, especially young people who are keen on fashion. Festival fashion landscape refers to the media that carries and reflects regional ideology within the scope of festival activities and is a collection of visual things and social concepts in the regional public space.

3 Overview of AI Painting

3.1 Principles and Application Fields of AI Painting

The generation mechanism of AI painting is to guide the generator to generate high-quality images by recognizing the text input by users, and it can synthesize different styles of images specified by users. The main generation mechanism is to use a language vision model (CLIP) to guide the generation of high-quality images, [3]. This mechanism serves as a bridge between text and image.

At present, text-to-image generation models can be divided into sequence-to-sequence modeling and

diffusion-based modeling. The former converts the image into discrete icon marks using the converter-based icon table, while the latter infuses the structured image information into noise through the diffusion process, and then regenerates the image through the reverse diffusion process. The application of AI painting in the field of design has been launched, especially involving illustration, film and television, architecture, and other related fields, and has begun to spread to other fields, [4]. However, in the need for national cultural inheritance and display, the design and creation of fashion landscape is still lacking of relevant design practices.

3.2 Overview of the Design Process of AI Painting

AI painting tools help creators quickly get their creative ideas, making them viable in the art and design world. In addition to the AI painting tool Mid Journey, other AI painting tools are also able to achieve similar purposes, which inspires people to explore how to use AI painting for artistic creation in the field of art and design.

Literature [5] proposed a knowledge-based framework for architectural design based on AI painting. By utilizing AI painting tools, creators can realize their creative ideas more efficiently and explore possibilities and variations in the creative process.

Since AI painting is a way of generating images based on text, the description of the text or the association and generalization of prompt words are the guarantee of the quality of the image generated by AI painting and are also the key factors in the display of the characteristic regional culture, [6].

Therefore, after the application practice of AI painting, the author extracts the design keywords of today's relevant design cases according to historical documents and strives to summarize the key design elements and the design factors, so as to obtain a more comprehensive design description as far as possible and prepare for the design generation of subsequent cases.

4 Typical Case Analysis of AI Landscape

The fashion landscape is not only a concentrated display of culture but also a prominent expression of various non-material cultural elements, carrying important social functions. Taking the festival fashion landscape as an example, the festival fashion landscape is characterized by combining

legends, auspicious patterns, craft materials, and other media with cultural significance, integrating culture and media, and then breeding landscape with traditional significance.

4.1 Textual Records of Festivals in Historical Documents

The Tang Dynasty already had descriptions of festival celebrations, and Song culture promoted the integration of symbolic patterns and symbols in handicrafts. The multicultural integration in the Yuan Dynasty promoted cultural diversity, and the Ming Dynasty paid more attention to the landscape style dominated by character stories. The lanterns in the Qing Dynasty narrated with cultural themes and used mature technology to form works with rich cultural connotations. Through the analysis of historical documents, we can find the festival category

Cultural focus of the landscape (Table 1 in Appendix).

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4.2 Modern Case Design Keyword Module Extraction

However, the description of modern festival landscapes is more contemporary, and these festival landscapes have integrated modern fashion elements. These modern fashion elements not only contain the artifacts and scenes described in historical documents but also combine modern science and technology, new materials, and other related characteristics of The Times, [9].

(1) Key design factors are extracted from the festival landing cases

The author selected a number of innovative festival fashion landscapes, such as "Furong New Year" combining Chengdu hibiscus flowers with lanterns to create an interactive atmosphere; "Miahui Luoshen" which combines Oriental elements and fantasy, presenting Chinese fantasy style; "Weilai View Garden" integrates national style and meta-universe, digital art and AR interaction to create novel experience; "Good State of the New Year" reinterprets traditional lanterns

and presents new visual effects; The Five-Colored Upside Down Rabbit uses traditional zodiac animals to create fashionable shapes to attract young people. These cases integrate tradition and fashion, inject local culture, and create unique national characteristics of the festival fashion landscape (Table 2 in Appendix).

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(2) Extract key design factors from digital creation cases

Ceramic Microbook uses folk techniques to transform traditional landscape paintings into virtual landscapes, while Caisson Creation uses projection technology to present Lingnan caisson culture on miniature models. Based on the Lingnan School of Painting, "Lingnan Landscape Illusion" uses 3D mapping and light projection to create a magical digital art space. "Flower Crown" is inspired by the Cantonese opera crown, through the digital technology of an LED fan screen, to create a media image medium. These works skillfully use digital means to bring traditional skills, painting, and regional culture into new creative ideas, presenting a unique artistic experience, [11].

4.4 Urban Fashion Landscape Design Model based on folk culture characteristics

From the perspectives of historical documents and contemporary design, the above content analyzes the text content of the current festival fashion landscape design. AI painting is a design tool based on the text of the image, image to image generation mode to operate, so the accurate grasp of the text, as well as the understanding of contemporary needs, is the key to making good use of AI painting tools. Contemporary visual narration takes the content of folk culture as the design object, uses modern technology as the expression method, and uses innovative ways to translate traditional culture into the fashion landscape, thus enabling viewers to have deep emotional experience and generate emotional resonance with the cultural meaning of the design object. The author thus clarified the design process of using AI painting to participate in the festival fashion landscape and then conducted the verification of this design process according to the design method and design theme, [12], (Table 3 in Appendix).

4.5 Sustainability Evaluation

In the entire process of landscape design, sustainability evaluation is a crucial aspect. It not only focuses on the immediate effects of the design but also on its long-term impact and environmental friendliness. Here is a detailed linguistic analysis of sustainability evaluation:

Sustainability evaluation requires a comprehensive and systematic evaluation framework that typically covers environmental, economic, and social dimensions. Environmentally, it primarily assesses the design's impact on natural resources, ecosystem integrity, energy consumption, and pollution emissions. Economically, it focuses on design costs, long-term maintenance expenses, and contributions to the local economy. Socially, it evaluates the design's impact on community culture, residents' quality of life, and social equity.

To accurately evaluate the sustainability of a design, a series of quantitative indicators need to be established. These indicators can be quantitative. By collecting and analyzing relevant data, the sustainability performance of the design can be objectively evaluated [13].

Sustainability evaluation needs to focus on the entire life cycle of the design, including all stages from planning, design, and construction, to operation, maintenance, and eventual demolition. This helps to comprehensively understand the design's impact on the environment and society at

different stages, thereby developing more comprehensive optimization strategies [12].

Sustainability evaluation should be a participatory process involving multiple stakeholders, such as designers, owners, community residents, government departments, etc. By broadly soliciting opinions from all parties, the comprehensiveness and fairness of the evaluation results can be ensured, while also contributing to enhancing the public acceptance and implementation effect of the design [15].

Sustainability evaluation is a continuous improvement process. Through regular evaluations of the sustainability performance of the design, problems, and deficiencies can be identified in time, and corresponding improvement measures can be formulated. This helps ensure that the design maintains a high level of sustainability during long-term use.

5 Conclusion

Based on the feasibility of AI painting in festival fashion landscape design, the author deeply analyzed the expression form of the festival fashion landscape, clarified the design process and text content of AI painting, and carried out the practice of double-drill model in the Wenzhou region.

AI painting, as a tool to quickly transform creative ideas into images, has the potential to assist creation of festival landscape design. It can read user text input and traditional cultural elements, and combine its own combinatorial ability to generate innovative designs.

AI painting plays a key role in image effects, conveying cultural characteristics and creating creative designs through its application in festival landscape design. As designers engage more with AI painting, they will be able to produce quality work more accurately. However, these works still need to be adjusted twice by the designer and modified in line with actual needs, indicating that AI painting needs to be combined with design needs and process requirements in the design process. Although AI painting has potential in design, it still needs the control and guidance of the designer.

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APPENDIX

Table 1. Textual records of festivals in historical documents

Historical Record	Keywords	Consolidated Summary
<p>Korean Lady placed a hundred-branch lamp tree, eighty feet tall, erected on a high mountain. On the night of the Lantern Festival, it was lit up, and its light could be seen for a hundred miles, outshining even the moonlight. The sons and nephews of Yang Guozhong, every time on the night of the Lantern Festival, each had a thousand red candles surrounding them.</p>	Object - Quantity - Size & Ratio - Color - Person - Scene Description	
<p>Water was hoisted to the top of the lantern booth using a winch, stored in wooden cabinets, and released gradually, resembling a waterfall. The grass was tied into the shape of dragons, covered with a blue curtain, and densely filled with ten thousand lanterns, creating a sight that wound around like two dragons flying away.</p>	Object - Quantity - Color - Scene Description	Festival - Object - Quantity - Content Details - Color - Scene Effect
<p>In the capital, there were lantern arches, made with fine wooden frames and painted with gold lacquer. The upper part was covered with fine gauze, depicting stories and operas [8], with lanterns placed in the middle, spaced out among thirty to forty units, each mounted on a frame. The ones on East Street were particularly exquisite, with lanterns painted with the entire story of Romance of the Three Kingdoms, the characters vividly portrayed.</p>	Object - Quantity - Content Details - Color - Scene Description	

Table 2. Case fusion diagram

Case Name	Theme Design	Keywords	Symbolic Elements	Symbolic Meaning
Furong Spring Festival (Chengdu)	Integration of Chengdu's Characteristics and Spring Festival Celebrations	Tangible Culture, Symbolic Meaning	Lantern Shapes, Hibiscus Flowers, Warm Atmosphere, Futuristic Feel, Folk Crafts, City Flower	<p>Lanterns symbolize festive joy and blessings; Hibiscus flowers, as the city flower, represent the refined and elegant city spirit; Warm atmosphere creates a cozy and festive mood; Futuristic elements showcase the fusion of modernity and tradition</p>
Enchanting Meeting with the Goddess of the Luo River (Beijing)	Combination of the Legend of the Goddess of the Luo River and Spring Festival Celebrations	Traditional Culture, Traditional Architecture, Auspicious Patterns	Image of the Goddess of the Luo River, Heavenly Palaces and Towers, Auspicious Clouds and Mythical Beasts, Chinese Fantasy Style	<p>Traditional elements such as the goddess's image, heavenly palaces, auspicious clouds, and mythical beasts symbolize the joy and blessings of the Spring Festival; They convey wishes for good fortune and happiness</p>
Future Garden (Guangzhou)	Collision of Future Technology and Traditional Culture	Metaverse, Fan, Gourd, AR Interaction, Internal Lighting, Futuristic Feel, Auspicious Patterns, Popular Culture, Traditional Crafts, Garden Aesthetics	Fan, Gourd, Metaverse, AR Interaction, Internal Lighting Design	<p>Blending traditional auspicious patterns with popular culture, utilizing metaverse and AR technology to showcase a futuristic feel, symbolizing blessings, good luck, and beauty, while embodying the garden aesthetic idea of changing scenery with each step</p>
Good State for the New Year (Shenzhen)	Lanterns and Blessing Messages Light Up the New Year's Momentum	Traditional Crafts, Calligraphy	Lanterns, Festive Atmosphere, Blessing Messages	<p>Lighting up lanterns symbolizes igniting one's good state, combined with calligraphy to convey blessings and festive wishes, symbolizing new hopes for the new year</p>

Case Name	Theme Design	Keywords	Symbolic Elements	Symbolic Meaning
Colorful Upside-down Rabbit (Shanghai)	Innovation of Traditional Zodiac Rabbit Image with Modern Design	Traditional Zodiac Rabbit Image, New Colors, Exaggerated Design, Festive Atmosphere, Modern Feel, Folk Symbol	Traditional Zodiac Rabbit, New Colors, Exaggerated Design	Based on the traditional zodiac rabbit, incorporating new colors and exaggerated design to showcase a modern feel, serving as a folk symbol that connects the emotions and culture of the Chinese nation, conveying the joy and happiness of the festival

Table 3. Integrated AI-driven Design Assistance Aspects and Their Benefits

Aspects	Description	Benefits
Initial Concepts	Rapid generation based on AI analysis of design cases	Reduces workload and focuses on creativity
Layout and Planning	Automated based on preset rules and conditions	Improves efficiency and ensures rationality and aesthetics
Real-time Simulation	Simulates effects in real-world environments	Provides an intuitive understanding of feasibility and effectiveness
Material Selection	Intelligent recommendations based on material analysis	Ensures aesthetics while considering practicality and economy
Cross-domain Knowledge	Integrates knowledge from multiple fields	Provides comprehensive and in-depth design support

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors equally contributed to the present research, at all stages from the formulation of the problem to the final findings and solution.

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Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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