

# Building a Semantic Bridge

## The P-A-T-S Model for Reimagining Ming Attire through AI

### Abstract

This study focuses on the attire of Ming dynasty scholar-officials, particularly the archetypal zhiduo garment and its associated cultural-semantic features, with the aim of building a “semantic bridge” between traditional semantics and contemporary visual design. Employing visual analysis and semantic mapping methods, and utilizing the AIGC tool Midjourney, the research investigates how traditional clothing can be translated and reconfigured within modern visual contexts.

The paper proposes a structured four-dimensional semantic model — “Person–Attire–Time–Setting” (P–A–T–S) — which serves as the core framework of this bridge, guiding prompt construction for AIGC and ensuring visual coherence and cultural consistency in the generated imagery. Through this model, the study achieves cross-modal translation from historical textual semantics to AI-generated images, systematically exploring pathways for the visual integration and semantic migration of traditional symbols in modern design environments.

Experiments demonstrate that AIGC functions not merely as a generative tool but as a key cultural interpreter, transforming abstract cultural semantics into perceptible visual language. This research contributes an operational methodology for AI-assisted design, while also providing a theoretical framework and practical approach for the semantic reconstruction of traditional Chinese attire within contemporary visual culture. Furthermore, it establishes a humanistic paradigm for the structured reconfiguration of Eastern visual semantics.



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**#ming dynasty scholar attire #AI-generated design #cultural expression #visual reconstruction #design innovation**

### 1. Introduction

In today’s context of global cultural exchange and diversified design languages, traditional dress is no longer regarded as a static historical relic, but has instead become a dynamic cultural resource open to redesign and recoding. Particularly with the advancement of AI-assisted visual design technologies, designers are now empowered to reactivate historical elements, integrating them into contemporary contexts and enabling them to participate in the construction of new forms of identity expression and lifestyle [1].

However, the fast fashion industry’s intensive extraction and consumption of cultural symbols on a global scale often lead to superficial and de-contextualized treatment of traditional elements, resulting in fragmented visual collages [2]. At the same time, although China’s “Guochao” (national trend) movement has gained widespread popularity among young people, it also faces challenges such as “formal retrospection” and “cultural emptiness” — where design symbols are excessively consumed yet lack semantic depth and cultural embeddedness.

Against this backdrop, avoiding “symbolic piling” and “contextual detachment” has become a critical issue in design revitalization. Previous academic research has suggested that AI is not only a technical tool for generation but also an interface for cultural recoding [3]. It can serve as a “translator” between design language and cultural semantics, helping to explore possible pathways from “symbolic reproduction” to “semantic generation” [4].

As one of the most culturally distinct types of traditional attire, Ming dynasty scholar-official clothing not only embodies the aesthetic ideals and ritual systems of the literati class but also reflects a profound integration between individuals and their environment, as well as between clothing and spatial experience [5]. This paper employs the Midjourney platform to extract visual elements and semantic structures of Ming scholar attire through AI-generated imagery, aiming to achieve formal transformation and cultural regeneration in contemporary fashion design practice [6]. Furthermore, by integrating interdisciplinary research on AI aesthetics and digital heritage [2] [3] [7], it explores the mechanisms of convergence between tradition and modernity in contemporary design.

### 1.1. The Zhiduo (直裰) Robe as a Semantic Medium

This study focuses on the zhiduo (直裰), a distinctive robe widely adopted by Ming dynasty literati, positioning it not merely as a garment but as a dense cultural, semiotic, and philosophical medium. Its significance extends beyond practical function, embodying a complex negotiation of social identity, ethical ideals, and aesthetic values within the nuanced socio-cultural landscape of late imperial China. Central to this analysis are the intertwined dimensions of Person and Attire:

the literati (士人) occupied a unique social position, poised between the formal rigidity of the bureaucratic elite and the pragmatic informality of common life, and their choice of the zhiduo reflected and enacted this ambiguity [8]. Through the robe, the wearer’s social identity, intellectual cultivation, and ethical disposition were visually articulated, making the zhiduo a medium for conveying both personal refinement and collective cultural values [8].

The zhiduo’s material and formal features — the plain, often undyed or lightly colored fabrics (hemp, cotton, or ramie), straight wide sleeves, vertical front closure, and simple ankle-length cut — were deliberate markers of literati status and ethical stance [9]. Color choices, such as subdued blues or jade-like greens, and the absence of decorative flourishes emphasized restraint and modesty, communicating moral integrity, cultivated taste, and philosophical alignment [10]. The standardized structure and functional design supported daily movement and scholarly activities, while subtly differentiating the wearer from both the ornate courtly elite and the purely utilitarian attire of peasants and artisans. In this way, the zhiduo operated as a “negative decoration,” where simplicity itself became a powerful visual rhetoric of intellect, virtue, and social belonging [9].

From a psychological perspective, clothing functions as an extension of self-identity, shaping both the wearer’s self-perception and the social perception of others [11]. The zhiduo enabled scholars to enact their persona across diverse contexts — academies, gardens, lecture halls, and informal gatherings — asserting cultural authority, embodying Confucian and Daoist virtues, and negotiating social ambiguity for those awaiting office, retired, or living in seclusion [8]. Scholars’ sartorial choices were informed by an acute awa-

renewed social visibility and cultural expectation: donning the zhiduo communicated not only moral and intellectual cultivation but also adherence to collective norms while retaining personal distinctiveness.

## 1.2. Integration of Person and Attire

Philosophically, the zhiduo can be interpreted as an embodied extension of ethical cultivation. In Confucian thought, external forms — including attire — serve as expressions of inner virtue, a tangible manifestation of “修身齐家治国平天下” (self-cultivation as the basis for social order). From a Daoist perspective, the robe’s simplicity, natural fiber, and flowing silhouette align with principles of spontaneity (*ziran* 自然) and harmony with the Dao, reflecting a life attuned to nature rather than ostentatious display. This dual philosophical grounding — Confucian moral discipline and Daoist naturalism — allowed the zhiduo to function as a bridge between the inner life of the literati and their outward social persona, situating clothing as a medium where ethical, aesthetic, and social identities converge.

Moreover, the zhiduo exemplifies the concept of clothing as a cognitive and social scaffold: it structures interaction, directs attention, and subtly influences behavior and perception. From a social-psychological viewpoint, clothing mediates self-concept and social positioning, reinforcing a sense of belonging to the literati cultural sphere while enabling individual differentiation [11]. The visual language of the robe — its color, cut, and drape — served as a non-verbal discourse, communicating intellect, virtue, and cultivated taste without recourse to words. In this sense, the zhiduo becomes both a psychological tool and a philosophical instrument, mediating between self, society, and moral aspiration.

The fusion of the wearer’s social and intellectual identity with the robe’s material and aesthetic properties transformed a functional outfit into a complex cultural and philosophical sign. In this light, the zhiduo is not only sartorial evidence but a semantic and philosophical artifact: a woven ideology through which Ming literati values,

ethical ideals, and cultivated persona were continuously enacted, rendered visible, and embedded into the fabric of daily life, defining a refined cultural tone that prized subtlety, integrity, intellectual cultivation, and alignment with moral and natural order [9] [10] [11].

## 1.3. Historical Context and the Visual Rhetoric of Scholar Dress

In the context of the Great Divergence, the late Ming dynasty (mid-16th to early 17th century) experienced profound transformations across economic, social, and cultural spheres, which directly shaped literati clothing practices. The rise of a vibrant commodity economy, urban cultural centers, and the circulation of printed visual and literary materials coincided with the spread of Neo-Confucian and Wang Yangming’s *xinxue* (心学, Learning of the Heart) philosophy. These developments loosened the rigid hierarchies of official ritual dress, creating temporal and spatial flexibility in daily life that allowed scholars to experiment with attire as a medium for cultural and moral expression. In particular, the timing and situational context of scholarly activities—lectures at academies, poetry gatherings in gardens, or moments of private contemplation in reclusive mountain retreats — were critical in shaping the semantic and symbolic significance of the zhiduo.

The zhiduo’s adoption across various temporal contexts illustrates how clothing encoded social rhythms and cultural expectations. Scholars wearing the robe at different times of day — morning lectures, afternoon tea gatherings, or evening meditation — communicated distinct ethical and intellectual states. Its standardized cut, subdued colors, and plain fabrics (hemp, cotton, or lightly dyed materials) were not only aesthetically restrained but also responsive to the temporal rhythm of literati life: formal enough for public engagement, yet adaptable for private reflection. In this sense, the robe functioned as a temporal marker, signaling both the scholar’s preparedness for civic or social duties and their ongoing cultivation of personal virtue.

Equally important is the spatial or environmental dimension, which situates the *zhiduo* within dynamic, meaningful landscapes. In visual materials such as *A Recluse Beneath the Pines* (松下高士图, Fig. 1) and *Tea Gathering at Huishan* (惠山茶会图, Fig. 2), the robes interact seamlessly with their settings: pine groves, mountain rocks, streams, tea tables, and pavilions. The scholars' gestures, posture, and orientation toward natural elements suggest harmony with the environment, embodying the Neo-Confucian ideal of *tian-ren he-yi* (天人合一, unity of humanity and nature). Subtle variations in light, compositional framing, and figure placement further enhance the impression of temporal progression – morning mist, dappled afternoon sunlight, or evening shadows – underscoring how setting and time together amplify the expressive and symbolic dimensions of the robe.

The fluidity and social mobility of the Ming literati further contextualize these visual dynamics. The intermingling of scholar and merchant classes (*shi-shang xiang hun*, 士商相混) disrupted traditional notions of hereditary status and created anxieties around social legitimacy. Even those advancing through the meritocratic imperial examination system experienced uncertainties: success, failure, or partial achievement in examinations could dramatically alter one's social position. In this context, clothing functioned as a flexible instrument for negotiating social identity, allowing literati to assert cultural authority and ethical refinement independently of official rank. The *zhiduo*, as the most commonly worn everyday robe of the literati, exemplifies this dynamic. Its structured yet understated design enabled scholars to visually communicate intellectual cultivation, moral integrity, and aesthetic sensibility without relying on the elaborate insignia or ceremonial embellishments typical of court attire.

The group-level adoption of the *zhiduo* illustrates its role as a socially and culturally mediated practice. Visual and textual sources demonstrate that the robe was consistently employed across diverse contexts: delivering lectures in



**Fig. 1** *A Recluse Beneath the Pines* (松下高士图).  
Source: Yantai Museum, China.

academies, attending tea gatherings, composing poetry in gardens, or retreating to reclusive mountain settings. This widespread and repeated use points to the collective dimensions of visual rhetoric, wherein clothing becomes a medium for persuasive communication (persuasive communication) at the societal level. Through their choices, scholars reinforced shared standards of decorum, cultivated taste, and moral comportment, transforming individual sartorial decisions into socially intelligible statements of literati identity.

### 1.3.1. Formal Analysis of Visual Materials: Time and Setting

**Fig. 1:** *A Recluse Beneath the Pines* (松下高士图). In this painting, the scholar is depicted standing



**Fig. 2** Tea Gathering at Huishan (惠山茶会图).  
Source: The Palace Museum, Beijing, China.

in a *zhiduo* amidst a grove of towering pines and scattered rocks. The temporal context is conveyed through diffuse morning light filtering through the foliage, suggesting early day reflection or study. The scholar's posture — slightly leaning forward, hands clasped within the wide sleeves — communicates attentiveness and contemplative calm. The robe's straight cut and subdued color palette harmonize with the natural environment, reinforcing the Neo-Confucian ideal of *tian-ren he-yi* (天人合一, unity of humanity and nature). The spatial arrangement, with the figure partially framed by foreground rocks and background pines, creates depth and a rhythm between the human subject and the environment, emphasizing

the scholar's integration with natural time cycles and the ethical meditation associated with the morning setting.

Fig. 2: Tea Gathering at Huishan (惠山茶会图). This work depicts multiple scholars, all wearing *zhiduo*, gathered for a tea session. The temporal cues — soft afternoon light casting gentle shadows — convey leisure and social engagement rather than formal ceremony. Gestures and body orientation establish social relationships: some figures bend slightly toward one another in conversation, while others engage with tea implements, highlighting coordination and shared cultural practices. The environmental setting — a pavilion surrounded by manicured rocks, trees, and distant



hills — frames the group and contextualizes their activity within an aesthetically cultivated space. The repeated visual motif of flowing robes, calm facial expressions, and coordinated postures produces a collective harmony, illustrating how the *zhiduo* mediates both personal and social identity across time and space.

### 13.2. Integration of Time and Setting

Across both paintings, the *zhiduo* functions not merely as clothing but as a temporal and environmental mediator. Its restrained form and color allow it to integrate seamlessly with changing light, natural surroundings, and the rhythms of scholarly life — from morning meditation to afterno-

on leisure. The materiality of the robe, combined with gestures, posture, and composition, conveys subtle variations in mood, ethical stance, and social interaction. Through these visual elements, the scholars' attire becomes a dynamic participant in both temporal experience and spatial narrative, reinforcing the broader semantic structure of Person-Attire-Time-Setting.

A comparative examination with the Daoist robe (*daopao*) further clarifies the nuanced function of the *zhiduo*. Whereas the *daopao* conveys spiritual detachment suited to monastic or meditative environments, the *zhiduo* negotiates both private and social spaces, allowing scholars to signal cultivated virtue and social belonging across

a variety of times and locations. Its adoption in multiple visual and textual contexts demonstrates a sophisticated integration of Person, Attire, Time, and Setting, transforming the robe from functional clothing into a versatile medium for temporal and environmental expression.

Textual sources complement visual analyses, highlighting repeated references to scholars “sitting in a zhiduo at dawn, observing bamboo shadows” [12] or “arranging scrolls in the zhiduo as the evening light waned” [13]. These accounts emphasize that the robe’s meaning was inseparable from the temporal and environmental contexts in which it was worn, demonstrating that Ming scholar dress evolved into a dynamic cultural rhetoric, embedding moral cultivation, social identity, and aesthetic taste into daily practice.

In sum, the late Ming zhiduo exemplifies how temporal cycles, spatial settings, social mobility, and collective sartorial practices coalesced to shape literati visual culture. By integrating Time and Setting into the analysis, the robe emerges as a dynamic medium that mediates scholarly identity, ethical stance, and aesthetic expression, producing a culturally intelligible visual language that harmonizes individual action, environmental engagement, and the rhythms of daily life.

## 2. Purpose

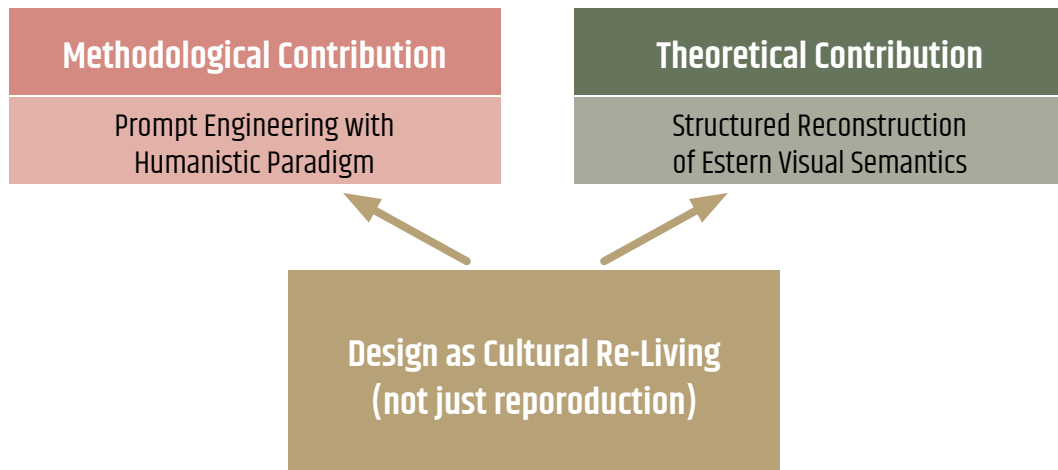
This study aims to explore how traditional dress culture can achieve semantically driven re-expression within contemporary visual systems

under the framework of AI-Generated Content (AIGC). Using Ming dynasty scholar-official attire as a central case, the research constructs a four-dimensional semantic model — “Person-Attire-Time-Setting” (人-衣-时-境) — to delineate the internal logic of identity and temperament, structural language, spatio-temporal context, and cultural connotations.

Leveraging the Midjourney image generation platform and semantic prompt construction functions, the study establishes a translation mechanism from historical semantics to visual generation, and employs experimental imagery to explore pathways for the visual representation of cultural meaning in AI-generated visuals.

The research emphasizes that cultural expression in design should extend beyond symbolic replication toward the reconstruction of semantic structures and the refinement of affective and aesthetic expression. In doing so, it provides both theoretical support and a methodological framework for the integration of AIGC into cultural visual systems.

On a methodological level, this study introduces a humanistic paradigm to prompt engineering through the delineation of structured semantic dimensions, enabling a traceable generative logic from “text → semantics → image.” This not only offers an experimental model for semantic construction in future human-AI collaboration but also opens new pathways for interdisciplinary research in design methodology.



**Fig. 3** Methodological and Theoretical Contributions Overview.  
Source: Own study.

Theoretically, the research proposes a structured reconceptualization of Eastern visual semantics. Through the digital translation of scholarly attire semantics, it demonstrates how cultural heritage can transition from “reproduction to revitalization” in contemporary expression. This approach not only addresses the challenge of “de-symbolization” in cultural heritage studies but also provides new case studies and methodological inspiration for digital humanities and visual culture research (as summarized in Fig. 3).

### 3. Method

Building on the detailed visual and semantic analysis of the Ming Dynasty *zhiduo* scholar attire and the proposed P-A-T-S (Person-Attire-Time-Setting) framework (Section 1), this study translates insights from cultural heritage and AI-driven design into an empirical investigation of audience perception. Cultural heritage designers and researchers not only interpret the historical and semantic meanings of traditional attire but also consider how these meanings can be effectively communicated and transformed through contemporary technological media such as AIGC. This study leverages these interdisciplinary insights to examine how both professional practitioners and general audiences perceive the cultural, aesthetic, and innovative values of AI-generated interpretations of Ming scholar attire. By connecting structured semantic modeling with audience research, the study aims to bridge the gap between expert knowledge and public appreciation, providing guidance for culturally informed and technologically integrated design strategies.

Informed by this perspective, the study specifically aimed to investigate how contemporary audiences perceive and evaluate AI-rendered traditional attire in today’s cultural and digital context. As a semantically rich artifact, Ming scholar attire carries layered meanings related to identity, ethics, temporality, and environment — yet it remains unclear whether these meanings are perceptible and resonant when mediated through AI-generated imagery. Specifically, the study sought to examine (1) whether professionals in design and cultural heritage hold perceptions that differ from those of general audiences, and (2) how both groups assess the modern applicability, authenticity, creative potential, and semantic coherence of AI-reconstructed attire.

To operationalize this inquiry, a questionnaire was developed focusing on five dimensions derived from the P-A-T-S semantic framework: understanding of heritage’s modern applications, views on authenticity versus adaptation, perception of AI’s creative potential, optimism for the future of semantic design, and comprehension of the P-A-T-S framework’s logic. By comparing responses from professional and non-professional participants, the study aimed to reveal how AI-mediated cultural heritage can be effectively designed and communicated to modern audiences while preserving semantic depth and engaging public interest.

#### 3.1 Research Design

This study adopted a quantitative cross-sectional survey design to systematically compare professional participants (design, art history, or cultural heritage practitioners) and non-professional participants (general audiences without specialized training). The research was informed by the four-dimensional P-A-T-S semantic model, aiming to connect theoretical analysis of traditional attire with empirical audience perception.

The survey focused on five dimensions of audience perception:

- **Understanding of heritage’s modern applications**
- **Views on authenticity versus adaptation**
- **Perception of AI’s creative potential**
- **Optimism for the future of semantic design**
- **Comprehension of the P-A-T-S framework’s logic**

By examining these dimensions, the study explores how professional expertise influences the perception and evaluation of AI-rendered cultural heritage, and how semantic-driven design frameworks can mediate engagement across audience types.

#### 3.2. Participants and Sampling Procedure

A total of 100 participants were recruited, divided into two distinct groups:

- **Professional group (n = 50):** individuals with academic or professional backgrounds in design, art history, or cultural heritage.
- **Non-professional group (n = 50):** general audiences without specialized training in related fields.

Participants were recruited via purposive and snowball sampling to ensure balanced representa-

tion between groups. Informed consent was obtained from all participants prior to data collection.

### 3.3. Instruments and Measures

A self-developed questionnaire was used to capture participants' perceptions across the five dimensions. All items were rated on a 5-point Likert scale (1="strongly disagree" to 5="strongly agree"). The questionnaire design was informed by the P-A-T-S semantic framework, linking identity, attire, temporal context, and environmental setting to audience perception and evaluation.

To systematically capture perceptual and cognitive responses, participants were exposed to a series of AI-generated images of Ming scholar attire created using Midjourney under the P-A-T-S prompt framework. Example images included scenarios such as:

- **A scholar in a zhiduo in a morning bamboo grove (Person–Attire–Time–Setting integration)**
- **A recluse in a zhiduo by a river in twilight**
- **Scholars in zhiduo engaged in conversation in a garden setting**

These images were generated using standardized parameters (Midjourney v6.1, fixed seed=1024, scenic style) to ensure visual and semantic consistency.

### 3.4. Data Collection Procedure

Participants completed the questionnaire after viewing the AI-generated image series. The images were presented in a fixed sequence reflecting variations along the P-A-T-S dimensions. This approach ensured that responses were grounded in concrete visual examples and allowed analysis of how semantic-driven image generation influences perception and appreciation. Data were collected both online and in-person, depending on participant availability and preference.

### 3.5. Data Analysis Plan

Data were analyzed using SPSS 27. Descriptive statistics (means and standard deviations) summarized overall sample characteristics and response patterns. Independent-samples t-tests were conducted to compare professional and non-professional responses across all five dimensions, assessing differences in perception, valuation, and comprehension. One-way ANOVA was

further applied to confirm the robustness of group effects. The analysis aimed to identify whether professional knowledge aligns with or diverges from general audience perspectives, and to evaluate the role of semantic modeling in mediating cultural heritage engagement in the age of AIGC.

## 4. Result

### 4.1. Bridging the Semantic Gap: How Professionals and Non-Professionals Perceive AI-Driven Cultural Heritage Reconstruction via the P-A-T-S Model

Independent-samples t-tests were conducted to examine the differences between professional and non-professional participants across five perceptual dimensions. The results revealed statistically significant differences in four of the five dimensions measured ( $*p^* < .001$ ), indicating substantially divergent perspectives between the two groups (Tab. 1).

Specifically, professionals demonstrated significantly greater awareness of heritage's modern applications ( $M = 3.92$ ,  $SD = 0.72$ ) compared to non-professionals ( $M = 2.48$ ,  $SD = 1.13$ ),  $*t^*(98) = 7.591$ ,  $*p^* < .001$ . Professionals also showed markedly more stringent views on authenticity versus adaptation ( $M = 4.54$ ,  $SD = 0.50$ ) than non-professionals ( $M = 2.34$ ,  $SD = 1.00$ ),  $*t^*(98) = 13.870$ ,  $*p^* < .001$ .

Conversely, non-professional participants expressed stronger belief in AI's creative potential ( $M = 3.56$ ,  $SD = 0.79$ ) compared to professionals ( $M = 2.44$ ,  $SD = 0.58$ ),  $*t^*(98) = -8.117$ ,  $*p^* < .001$ . Non-professionals also showed greater optimism for the future of semantic design ( $M = 4.02$ ,  $SD = 1.19$ ) than professionals ( $M = 3.02$ ,  $SD = 1.17$ ),  $*t^*(98) = -4.245$ ,  $*p^* < .001$ .

Notably, no significant difference was found between groups in their comprehension of the P-A-T-S framework's logic ( $M = 3.82$  vs.  $4.12$ ),  $*t^*(98) = -1.543$ ,  $*p^* = .126$ , suggesting comparable understanding of the methodological approach across expertise levels.

These quantitative findings set the stage for a deeper qualitative interpretation. The consistent and significant divide in four out of five dimensions suggests that professionals and non-professionals may be applying fundamentally different evaluative frameworks when engaging with AIGC-rendered cultural heritage — a divergence that the following discussion will explore in relation to the P-A-T-S model's capacity to mediate between semantic depth and visual accessibility.

**Tab. 1** Independent-Samples t-Test Results Comparing Professionals and Non-Professionals Across Five Survey Questions. Source: Own study

Variables	Group	M	SD	t	df	p
Understanding heritage's modern applications	Professional	3,92	0,72	7,591	98	<0,001
	Non-Professional	2,48	1,13			
Views on authenticity versus adaptation	Professional	4,54	0,50	13,870	98	<0,001
	Non-Professional	2,34	1,00			
Perception of AI's creative potential	Professional	2,44	0,58	-8,117	98	<0,001
	Non-Professional	3,56	0,79			
Optimism for the future of semantic design	Professional	3,02	1,17	-4,245	98	<0,001
	Non-Professional	4,02	1,19			
Grasping the P-A-T-S framework's logic	Professional	3,82	0,87	-1,543	98	0,126
	Non-Professional	4,12	1,06			

**Note.** M and SD represent mean and standard deviation, respectively.

## 5. Discussion: Semantic Values and Contemporary Design Implications

The survey findings reveal a clear divergence between professional and non-professional perceptions of AIGC-assisted cultural design. Professionals emphasized the semantic integrity and historical coherence of AI-generated images, whereas non-professionals responded more strongly to their visual appeal and contemporary creativity. This contrast underscores the dual nature of AIGC as both a semantic and aesthetic mediator — capable of linking historical knowledge with modern visual sensibilities.

These results validate the analytical potential of the P-A-T-S framework: by organizing “Person-Attire-Time-Setting” relationships into a coherent structure, AIGC can communicate different layers of meaning to distinct audiences. For experts, this framework activates hermeneutic and historical

dimensions of dress culture; for general viewers, it enhances accessibility through visual engagement. The model therefore bridges academic interpretation and public perception, aligning with the study’s broader goal of transforming traditional attire from static heritage into a living semantic system.

### 5.1. The P-A-T-S Framework in Historical and Contemporary Context

By integrating historical accounts, literary descriptions, and visual evidence from Ming-era paintings, this study demonstrates how the zhiduo embodied a dynamic interplay between the individual and their cultural milieu. The dimensions of Person-Attire-Time-Setting were not arbitrary but emerged through repeated observation and cross-referencing of primary sources. The documented sartorial choices of Wang Yangming provide a compelling illustration of how ethical principles, social

identity, temporal context, and environmental setting collectively shaped the meaning of attire:

*“As a young man, Duke Jingchuan abhorred luxury. When dressed in bright or fashionable clothing, he would blush and avoid going outside, and the garments would soon be soiled. Even in his later years, despite his rank, he never had even a single piece of fine silk made for himself. After being dismissed from office, he wore only a plain blue zhiduo, the same turban and shoes for over a decade. He would travel in a small boat, lowering his head and tucking his legs to sit cross-legged. Passersby, not knowing who he was, would often mock him. Fellow passengers, incensed on his behalf, watched as he remained calmly indifferent.”*

— Jianwen lu, Vol. 3, compiled by Chen Jiru, Ming dynasty, Wanli edition, p. 17.

This account traces Wang’s aesthetic consistency from youth to retirement, demonstrating the zhiduo’s deployment as visual language across all P-A-T-S dimensions. From the Person dimension, Wang’s clothing choices reflected profound moral deliberation. Despite achieving high office, he consistently rejected luxurious adornment, making his attire a visible manifestation of ethical discipline that embodied the Neo-Confucian ideal of “self-restraint and ritual restoration.” The plainness, durability, and unadorned quality of his zhiduo aligned precisely with his philosophical commitment to innate knowledge and the unity of knowledge and action.

The Attire dimension reveals how the plain blue zhiduo operated within a precise social semiotics — distinct from both ceremonial robes with their explicit insignia and commoners’ purely functional garments. This intentional simplicity, rooted in Confucian aesthetics of restraint, transformed the robe into a vehicle of symbolic subtlety. Wang’s consistent adherence to this attire over more than a decade constituted not mere habit but a sustained rhetorical performance — a continuous expression of values materialized through fabric.

The Time dimension illuminates how Wang’s clothing practice transcended temporal changes in his official status. His maintained attire across the transition from political prominence to rural seclusion suggests a deliberate resistance to external status markers and a profound commitment to inner virtue as the true constant. Thus,

clothing served as a medium for temporal continuity of identity, asserting moral consistency amidst changing circumstances.

The Setting dimension captures Wang’s strategic use of environment and posture. His depiction in a boat — head lowered, cross-legged, visually indistinguishable from commoners — demonstrates a sophisticated attunement to vernacular context. This spatial practice, combining ordinary dress with modest behavior, effectively dissolved class distinctions through what might be termed a strategy of “non-performance,” where social humility itself becomes culturally potent.

These historical cases illustrate how everyday attire in Ming society helped construct an integrated identity-morality-environment nexus. Clothing thus transcended social protocol to become a symbolic field where individual cultivation, historical awareness, and visual expression intersected.

## 5.2 Semantic Modeling and Prompt Logic in AIGC

To address the challenges of manual interpretation and potential cultural bias in traditional visual-semantic analysis, this study developed a structured four-dimensional prompt system based on the “semantic-driven” P-A-T-S model. This approach leverages AIGC to efficiently generate large volumes of image samples, enabling systematic observation of how traditional meanings couple with contemporary visual forms. By translating cultural semantics into structured prompts, the method reduces reliance on manual modeling and mitigates subjective distortions, while facilitating the extraction of cross-situational semantic patterns — an approach aligned with recent advances in cross-domain design [14].

Using Midjourney, this study implemented the P-A-T-S framework to simulate contemporary reinterpretations of Ming scholar attire. Each dimension was operationalized through targeted keyword combinations:

- **Person:** cultural identity and temperament (e.g., Ming Dynasty scholar, Confucian gentleman)
- **Attire:** garment type and materiality (e.g., zhiduo robe, plain blue cloth)
- **Time:** temporal and emotional context (e.g., early spring morning, after demotion)
- **Setting:** spatial and cultural environment (e.g., bamboo grove, wooden boat)

Dimension	Semantic Aspect	Sample Prompt Terms
Person	Identity / Disposition	Ming Dynasty scholar, Confucian gentleman, moral refinement, restraint
Attire	Garment / Pattern	Zhiduo robe, plain blue cloth, wide sleeve, no pattern
Time	Temporal Context	Early spring morning, retirement, after demotion
Setting	Spatial Environment	Bamboo grove, riverside, wooden boat, lecture hall

Fig. 4 Person–Attire–Time–Setting. Source: Own study.

This semantic prompt logic was further systematized through a Python-based automatic prompt composition function:

```

python
def generate_prompt (identity, attire, time, environment):
    return f"{identity}, wearing {attire}, in {time}
           {environment}..."
    
```

By inputting keywords from different semantic dimensions, this function generates structured prompts that ensure semantic consistency, enabling Midjourney to produce images that reflect both humanistic values and coherent cultural structures (Fig. 4).

By inputting keywords from different semantic dimensions into this function, it produces prompt sequences that adhere to the principle of semantic consistency, enabling Midjourney to generate images that reflect both humanistic values and cultural structures. This semantic-driven prompt construction approach indicates that AIGC tools are not merely generative technologies, but also serve as design interfaces that bridge traditional semantics and contemporary visual expression.

To more clearly demonstrate the practical efficacy of the “human-attire-time-setting” semantic-driven generation model in image construction, the author compiled visual and textual materials from classical Chinese sources depicting Ming dynasty scholar-officials in everyday zhiduo. Centered on four semantic dimensions – Human (identity/temperament), Attire (form/material), Time (temporal context), and Setting (spatial scene) – a structured and combinable system of Midjourney prompt logic was developed.

By writing semantic combination functions in Python, symbolic elements from traditional contexts were converted into image generation instructions for AIGC, resulting in a large collection of culturally coherent visuals, as shown in the figures.

Building on this foundation, the author conducted semantic ranking and structural analysis of the generated images to construct a logically coherent image semantic matrix. This matrix is not only a visual compilation, but also a spatial mapping of semantic logic. Based on two axes – “personal temperament/social identity” and “scene dynamics/temporal context” – the images were classified into four culturally symbolic quadrants. In the figure (Fig. 5), the horizontal axis represents the tension between dynamic and static contexts, while the vertical axis reflects the Confucian-Daoist disposition in body posture, forming a two-dimensional semantic coordinate system. The upper-left quadrant features static portraits in the style of classical painting, emphasizing the material quality of attire and the representation of identity; the lower-right quadrant, by contrast, presents dynamic everyday scenes such as travel, social visits, and boating, highlighting the visual interplay between clothing, setting, and light.

These images not only faithfully recreate the Ming scholar-official archetype – zhiduo robe paired with Scholarly headwear / Headgear of literati [15] – but also validate the theoretical structure of the semantic-driven generation model at a visual-semiotic level. The generative path from “keywords to image” reflects a procedural design logic that bridges cultural text with contemporary expression. This demonstrates that AI-assisted image generation is not merely



**Fig. 5** Findings Derived from Images Generated by the Author Using Midjourney. (Generated via Midjourney v6.1 (seed=1024,v-style scenic), demonstrating semantic coherence across quadrants.)  
Source: Own study.

a technical process of form production, but a mechanism for the co-construction of visual language and cultural meaning.

### 5.3. Bridging Expert and Public Expectations: AIGC as a Semantic Mediator in Cultural Design

In today's rapidly evolving visual design landscape, traditional cultural elements have experienced an unprecedented proliferation across diverse fields including product design, fashion, spatial design, and interaction design. This trend reflects a profound societal desire to reconnect with cultural identity, heritage, and aesthetic lineage in an increasingly globalized and digitally mediated world. However, this very proliferation has brought to light a critical and persistent challenge: the pervasive tendency towards superficial revivalism, decorative "cultural packaging," and aesthetic mimicry that fundamentally

fails to engage with the deeper semantic, contextual, and experiential dimensions of tradition. The central question confronting contemporary designers has evolved beyond simply how to reference traditional motifs, to how to internalize cultural principles in ways that resonate meaningfully across different audience expectations – satisfying both professional demands for semantic authenticity and historical accuracy, while simultaneously meeting public preferences for accessible visual engagement and contemporary relevance.

A genuine sense of "cultural depth" in design should arise not merely from the mechanical reuse of patterns, the simplistic mimicry of forms, or the arbitrary collage of symbolic colors, but rather through the careful cultivation of aesthetic temperament, situational coherence, and empathetic alignment with diverse users' lives and values [16].



Culture, understood in this more profound sense, becomes not simply something to be displayed or observed, but something to be authentically worn, meaningfully inhabited, and truly lived — a dynamic and participatory construct that actively engages the senses, cognition, and emotion across different user groups with varying levels of cultural literacy.

Against this complex backdrop, Artificial Intelligence-Generated Content (AIGC) technologies are emerging not merely as tools of stylistic reproduction, but as crucial mediators and enablers of a profound methodological shift in how designers engage with cultural heritage. While professional experts and scholars typically seek historical accuracy, semantic integrity, and cultural authenticity in heritage reinterpretation, general audiences often respond more strongly to visual novelty, emotional resonance, and immediate contextual relevance.

This fundamental divergence in expectations and evaluation criteria has traditionally created a significant challenge for cultural design. However, AIGC strategically addresses this divide by serving as both an analytical and generative platform that enables designers to systematically decode complex cultural semantics while creatively recomposing them into visual forms that speak effectively to contemporary sensibilities across this spectrum of expectations.

Moving substantially beyond basic image generation or superficial surface rendering, AIGC supports rapid iteration, semantic recombination, and context-aware prototyping, allowing designers to explore how traditional principles can be authentically maintained while simultaneously adapting to modern functional requirements and aesthetic expectations. This dual capacity makes AIGC particularly valuable for meaningful cultural revival

— it transcends mere replication to enable principled reinterpretation, creating sophisticated design languages that honor traditional meaning while genuinely engaging modern audiences across the professional-public divide.

The Person-Attire-Time-Setting (P-A-T-S) model plays a particularly pivotal role in systematically reconciling these different audience expectations and requirements. For professionals and cultural experts, it provides a structured, rigorous framework for maintaining semantic fidelity and historical accuracy through clearly defined dimensions of analysis. For public audiences and general users, it ensures visual coherence, contextual relevance, and immediate accessibility. This sophisticated model allows designers to systematically address the concerns of both groups: professionals can trace how historical meanings and cultural values are carefully preserved and translated through the four interconnected dimensions, while general users experience culturally grounded yet visually engaging and emotionally resonant outputs. The framework thus functions as an effective translation mechanism — converting expert knowledge and cultural understanding into publicly accessible forms without compromising essential cultural depth or historical authenticity.

From a comprehensive practical perspective, AIGC serves multiple distinct but interconnected functions in bridging this critical gap between expert standards and public accessibility. It acts as an efficient semantic testing ground where abstract cultural concepts, philosophical principles, and social values can be systematically encoded into structured prompt language, generating diverse outputs that carefully balance historical principles with contemporary appeal and relevance. It supports iterative visualization and comparative

analysis, allowing designers to rapidly generate and objectively evaluate multiple variations in form, proportion, color, texture, and contextual presentation, thereby testing how semantic fidelity interacts with functional requirements, ergonomic constraints, and diverse aesthetic expectations across different user groups. Most importantly, it facilitates collaborative reflection and user engagement – generated images and prototypes can be easily shared with diverse audiences including community stakeholders, cultural experts, and end-users to assess cultural intelligibility, emotional resonance, and perceptual authenticity, creating continuous feedback loops that progressively align design outcomes with both expert validation and public acceptance.

The psychological dimension of this approach further reinforces AIGC's mediating role between different user expectations. Clothing and design fundamentally function as extensions of self and identity, significantly shaping how individuals perceive themselves and are perceived by others across different cultural contexts and user groups [11]. AIGC-enhanced semantic design strategically strengthens this psychological relationship by embedding cultural values and identity narratives into material and digital artifacts that help users navigate their personal position within cultural continuums. For professionals and cultural practitioners, this maintains meaningful connection to tradition and historical authenticity; for public users and general audiences, it provides accessible entry points to cultural identity and heritage appreciation.

Philosophically, this integrated approach resonates deeply with classical Eastern traditions where outer form consciously reflects inner virtue, and material expression embodies spiritual values. The zhiduo robe, with its deliberate austerity, organic materials, and structural clarity, powerfully exemplifies this essential unity of ethics and

aesthetics. AIGC-enabled semantic translation allows contemporary designers to capture such philosophical coherence without resorting to stylistic imitation or historical pastiche, creating innovative designs that embody traditional values like restraint, balance, and contextual harmony while remaining genuinely relevant to contemporary life and diverse user expectations. This solid philosophical foundation ensures that even highly experimental or technologically mediated designs retain their essential cultural authenticity while appealing to modern sensibilities across the professional-public spectrum.

In terms of cultural sustainability and continuity, this methodology importantly redefines tradition as a dynamic, renewable system rather than a static collection of forms to be preserved. Rather than treating cultural heritage as fixed artifacts or rigid forms to be mechanically reproduced, it enables continuous cultural reconstruction through creative engagement and adaptive reinterpretation. AIGC strategically facilitates this sustainable process through what might be termed digital craftsmanship – a process where cultural semantics are thoughtfully recomposed rather than slavishly copied, allowing for endless variation and innovation while preserving core meanings and values. This approach is particularly important in addressing the different priorities of professionals and public audiences – the former typically seeking to preserve cultural essence and historical accuracy, the latter often desiring contemporary relevance and immediate accessibility.

Ultimately, this integrated approach fosters the development of a new design literacy where designers become sophisticated cultural interpreters and users become active participants in the continuous remaking of living tradition. Through context-aware wearables, temporally responsive spaces, and culturally intelligent interfaces, design evolves

into an ongoing conversation between heritage and innovation, tradition and contemporaneity. This represents a significant evolution from industrial-era paradigms that prioritized standardization, mass production, and formal novelty over cultural meaning and personal belonging. In this new framework, truly successful design must satisfy both professional criteria for cultural accuracy and historical authenticity, while simultaneously meeting public expectations for engaging experiences and contemporary relevance — becoming not just visually appealing but culturally meaningful and existentially fitting for diverse audiences with different backgrounds, knowledge levels, and expectations.

This powerful synergy between AIGC and semantic modeling enables a crucial shift from simple cultural revival to active cultural reconstruction. Heritage becomes a living, breathing system continuously adapted to contemporary experience and diverse user needs, with AIGC providing the necessary representational flexibility and technical capability to navigate complex cultural meanings across different audience expectations. Through this comprehensive approach, designers can create artifacts that are functionally sound, aesthetically compelling, culturally authentic, and publicly accessible — fostering a revitalized relationship between tradition and modern life where culture is continuously enacted, embodied, and evolved through use across different segments of society, thereby ensuring its continued relevance and vitality in an increasingly globalized world.

## 6. Conclusion and Future Research

This study has demonstrated how AI-generated content (AIGC) can empower the visual reactivation and contemporary reinterpretation of traditional Ming-dynasty scholar dress. By functioning as both a generative tool and an experimental interface, AIGC enables designers to explore the complex relationships between historical knowledge, aesthetic principles, and cultural meaning. Instead of relying on superficial replication or decorative imitation, designers can engage with the underlying semantics of traditional attire, reconstructing its cultural logic and translating it into contemporary forms and contexts.

The Person-Attire-Time-Setting model introduced in this research provides a structured methodology for integrating historical dress culture into modern design workflows. By explicitly lin-

king identity, garment form, temporal context, and environmental setting, designers are able to create outputs that are not only visually coherent but culturally and ethically informed. In practical terms, AIGC accelerates this process: it allows rapid iteration of design concepts, experimentation with color, texture, and form, and immediate visualization of how traditional elements interact with contemporary design scenarios.

Beyond efficiency, AIGC offers a methodological advantage for cultural heritage innovation. It facilitates exploration of multiple design pathways that maintain historical fidelity while adapting to modern usability, aesthetics, and social contexts. Designers can test hypothetical combinations of traditional motifs, materials, and silhouettes, observing which configurations effectively convey historical meaning without resorting to mere pastiche. This process helps avoid common pitfalls of cultural appropriation or shallow revivalism, ensuring that heritage-informed designs remain authentic, resonant, and contextually relevant.

The divergent perceptions between professional and general audiences revealed in this study point to an important consideration for future heritage innovation. While professionals tend to prioritize semantic integrity and historical accuracy, non-professionals show stronger receptivity to creative adaptation and visual modernity. This suggests that successful cultural revitalization requires a balanced approach — one that preserves essential cultural semantics while embracing contemporary expressive forms. The P-A-T-S model provides precisely such a framework, enabling designers to maintain core cultural values while exploring innovative visual expressions that resonate with diverse audiences.

Looking to the future, the integration of AIGC into design practice opens several promising directions. First, interactive and immersive design environments — such as VR or AR applications — can leverage AI-generated imagery to allow users to experience traditional garments dynamically, understanding how identity, form, and context interact in real time. Second, AIGC can support cross-disciplinary cultural research, combining historical archives, visual records, and textual sources to generate new insights about historical aesthetics and social practices. Third, AI platforms can serve as collaborative partners, enabling designers to focus on conceptual inno-

vation while using AI to explore variations, test visual coherence, and evaluate user perception efficiently. Fourth, future studies could develop adaptive AIGC systems that automatically adjust output styles based on different audience preferences, creating personalized cultural experiences that bridge the gap between expert standards and public accessibility.

In this way, the future of AIGC-assisted design emphasizes responsible cultural innovation: a careful balance between historical understanding, semantic depth, and creative adaptation. Traditional dress, architecture, and other heritage elements can be reactivated in ways that respect their original meaning, while also addressing contemporary aesthetic and functional requirements. This approach transforms cultural heritage from static artifacts into living, adaptable design resources, allowing designers to generate works that are simultaneously historically informed, socially meaningful, and visually compelling.

In conclusion, AI-generated technologies provide designers with unprecedented tools for reimagining cultural heritage. By combining structured semantic models with AIGC workflows, designers can create innovative, authentic, and contextually sensitive interpretations of traditional forms. The future of cultural design lies in leveraging AI not merely as a production tool, but as a dynamic partner in cultural discovery, experimentation, and responsible innovation, enabling heritage to thrive within contemporary visual and social landscapes while respecting the diverse expectations of both specialized and general audiences. ■

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## References

1. Kang Y., Wu S., Ko Y. A., Martin K., & Ko H. S. (2013). Digital production of traditional costumes. In 2013 Digital Heritage International Congress (DigitalHeritage), pp. 239-242, IEEE. <https://doi.org/10.1109/DigitalHeritage.2013.6743742>
2. Giaccardi, E. (2012). *Heritage and social media: Understanding heritage in a participatory culture*. Routledge.
3. Manovich, L. (2019). *AI aesthetics*. Moscow: Strelka Press. <https://strelka.com/en/book/ai-aesthetics>
4. McCormack, J., Bown, O., & Dorin, A. (2022). Creative AI: Human-machine creativity. *Artificial Intelligence*, 305, 103662. <https://doi.org/10.1016/j.artint.2022.103662>
5. Deng, M., & Chen, L. (2025). CDGFD: Cross-Domain Generalization in Ethnic Fashion Design Using LLMs and GANs: A Symbolic and Geometric Approach. *IEEE Access*, 13, pp. 7192-7207. <https://doi.org/10.1109/ACCESS.2024.3524444>
6. Liu, K., Gao, Y., Zhang, J., et al. (2022). Study on digital protection and innovative design of Qin opera costumes. *Heritage Science*, 10, 127. <https://doi.org/10.1186/s40494-022-00762-x>
7. McCormack, J., Gifford, T., & Hutchings, P. (2019). Autonomy, authenticity, authorship and intention in computer generated art. *Proceedings of the 2019 Conference on Creativity and Cognition (C&C, 19)*, pp. 185-196. <https://doi.org/10.1145/3325480.3326552>
8. Wu, Y. (2022). Discussion on the fashion of literati and officialdoms in the Song dynasty. Atlantis Press. <https://www.atlantis-press.com/article/125970424.pdf>
9. Zhang, R. (2023). Zhiduo: Ancient Chinese writers' clothing. Zhang Ruying. <https://www.zhangruying.com/en/549>
10. Xu, Y. (2018). The aesthetization of moral education in traditional literati painting. Atlantis Press. <https://www.atlantis-press.com/article/55908286.pdf>
11. Ren, G. (2024). Traditional value identity and mental health correlation among Chinese adolescents. *PMC*. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11591459/>
12. Wen, Z. (2001). *Chang wu zhi 长物志* (H. Wang, Ed.). Shanghai Bookstore Publishing House. (Original work published ca. 1630), p. 118.
13. Chen, J. (Ed.). (1610). *Jian wen lu 见闻录* [Records of Observations] (Vol. 3, p. 17). Shanghai Zhai. (Original work published in Wanli period)
14. Meizhen, D., & Ling, C. (2025). CDGFD: Cross-domain generalization in ethnic fashion design using LLMs and GANs: A symbolic and geometric approach. *IEEE Access*, 13, 7192. <https://doi.org/10.1109/ACCESS.2024.3524444>
15. Ji, S. (2001). The hair-holding cap for man and the hairnet for women in the Ming Dynasty. *Wenwu*, 7, pp. 62-83.
16. Wuri, W. (2021). Research on the protection and inheritance of intangible cultural heritage industry of ethnic minorities with small population in China. *The Frontiers of Society, Science and Technology*, 3(8), pp. 86-91. <https://doi.org/10.25236/FSST.2021.030815>