Research on Cinematic Scene Narrative and New Media Installation Interaction Design in Landscape Environmental Design

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ABSTRACT Contemporary landscape design is shifting from static space construction to dynamic narrative experience. The interdisciplinary integration of cinematic narrative theory and new media installation technology provides systematic methodological support for this transformation. Based on cinematic narrative languages including montage logic, viewpoint control and time-space compression, this paper explores their isomorphic relationships with landscape spatial sequence, tour route perspective and historical narration. With three layers of interaction mechanisms—perception triggering, AI dynamic content generation and multi-sensory emotional feedback, it reveals the functional positioning and integration paths of new media installations in landscape narration. On this basis, an integrated design methodology system covering narrative theme extraction, multi-level space construction and standardized design processes is constructed. The feasibility of the system is verified through typical landscape project cases, supplemented by questionnaires and eye-tracking experiments for effect evaluation, and AI-assisted iterative optimization is realized based on evaluation data. The research shows that the in-depth integration of cinematic narration and new media interaction can significantly enhance the narrative tension of landscape spaces and the depth of public participation, providing innovative paths for the activation, utilization and emotional communication of cultural landscapes.

INDEX TERMS Cinematic Narration; Landscape Environmental Design; New Media Installation; Interaction Design; AI-Assisted Design

I. INTRODUCTION

As a critical field for human-environment interaction, landscape space's narrative function has long attracted attention from planning and design academia.

Nevertheless, traditional landscape design centers on static visual elements and fixed spatial sequences, failing to satisfy the public's demand for in-depth experience and emotional resonance. With the rapid advancement of digital technologies, new media installations and interactive technologies have been widely applied in exhibition, architectural and public space sectors, offering technical conditions for dynamic and personalized expression of landscape narration.

Meanwhile, cinematic narrative theory, with its mature time-space construction logic and emotional mobilization mechanisms, has increasingly become an important cross-disciplinary reference for spatial design. Cinematic languages such as montage editing, scene transition and viewpoint movement share profound structural correspondences with tour route rhythm, visual field control and historical scene reproduction in landscapes. However, systematic integrated research on the two remains insufficient. Currently, how to integrate cinematic narrative thinking and new media installation technologies into landscape design practice to form operable methodological systems is a core proposition driving the upgrade of landscape spaces from visual presentation to narrative experience. This study aims to establish a landscape design framework integrating cinematic narration and new media interaction, so as to provide theoretical support and methodological references for practical work.

II. APPLICABILITY BASIS OF CINEMATIC NARRATIVE THEORY IN LANDSCAPE DESIGN

A. THE NARRATIVE ESSENCE OF LANDSCAPE SPACE—CONCEPT EVOLUTION FROM GENIUS LOCI TO NARRATIVE FIELD

Landscape space is never merely a combination of physical forms; its essence is the spatial expression of cultural

memory and human experience.

The concept of "Genius Loci" proposed by Christian Norberg-Schulz emphasizes that authentic places possess unique identity recognition and meaning belonging, formed by long-term accumulation of natural and humanistic elements. On this basis, contemporary landscape theory introduces the discourse of "narrative field", arguing that landscapes not only carry place memory but also actively organize visitors' travel paths, visual focuses and emotional rhythms through spatial sequences, forming narrative processes with a clear beginning, development, climax and ending.

This conceptual evolution signals a shift in the core task of landscape design: from shaping aesthetic physical environments to constructing narrative experiences that trigger emotional resonance and meaning production. Topographic undulations, vegetation density, water forms, pavement materials and other visual elements in landscapes can all serve as narrative symbols within a narrative framework to transmit information and evoke emotions.

American landscape theorist John Brinckerhoff Jackson pointed out that roads and paths are the most primitive media of landscape narration. Humans perceive space and construct memory while moving, a mechanism highly analogous to how film audiences perceive images over the passage of time.

Thus, landscape space inherently possesses the structural foundation to accommodate cinematic narrative theory[1].

B. ISOMORPHIC RELATIONSHIP BETWEEN CINEMATIC NARRATIVE LANGUAGE AND LANDSCAPE SPATIAL LANGUAGE

1) Corresponding Mechanism Between Montage Logic and Landscape Sequence Rhythm

Montage is the core organizing technique of cinematic narration. By juxtaposing and editing different shots, it generates narrative meanings in the audience's mind that transcend individual shots.

In landscape sequence design, the organizational logic of spatial units shares deep isomorphism with montage editing: the sequential arrangement of entrance plazas, transition corridors, core nodes and epilogue spaces is essentially a kind of "spatial montage". By controlling contrast relationships between different spatial units (open vs. enclosed, bright vs. dim, grand vs. delicate), designers arouse a sense of rhythm and anticipation in moving visitors.

Sergei Eisenstein's "conflict montage" theory holds that juxtaposing opposing shots generates a tertiary layer of meaning. An equivalent technique in landscapes is the sudden transition from bustling urban spaces to tranquil gardens, where contrast tension endows the latter with deeper psychological experience. Such "spatial editing" does not rely on linear time, but is realized through precise control of pedestrian flow paths and visual focuses by designers, highly aligning with the meaning-production logic of montage[2].

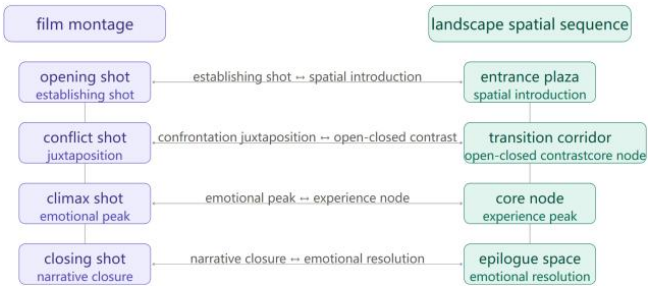

FIGURE 1. Schematic Diagram of Corresponding Relationship Between Montage Logic and Landscape Sequence Rhythm

2) Viewpoint Control and Transformation of Visitors' Perspectives Along Landscape Tour Routes

Films control audience attention via camera movement and lens language, while landscape design guides visitors' perspectives through tour route planning and visual field manipulation. Fixed shots correspond to stationary viewing platforms in landscapes; panning shots correspond to continuous perspective shifts along curved verandas; high-angle and low-angle shots correspond to slope terrain shaping viewing elevation angles. In Cinema 1: The Movement Image, Gilles Deleuze argues that camera movement is essentially the temporalization of spatial perception. In landscapes, visitors' bodily movement transforms spatial perception into temporal experience, with consistent perceptual structures[3].

Designers may draw on cinematic storyboard thinking to set "visual editing points" at key nodes of landscape tour routes: view obstruction via landscape walls, visual containment by forest belts or topographic undulations create abrupt opening and closing of sightlines, simulating the visual impact of shot switching. This thinking of "walkable storyboards" adds a temporal narrative dimension to landscape design[4].

For practical operation, setting "visual editing points" requires precise prediction with GIS terrain analysis and visual field simulation tools (e. g., ArcGIS Viewshed analysis, Rhino Grasshopper sight simulation plug-ins). Designers can simulate changes in visitors' visual fields at different heights and walking speeds within digital models to identify "visual climax points" and "blind spots", enabling accurate placement of obstructive elements or landscape focal points at critical tour route nodes. This digital workflow introduces cinematic storyboard logic into the preliminary analysis stage of landscape design, greatly improving the precision and predictability of viewpoint control design, and represents a typical embodiment of deep integration between cinematic narrative thinking and contemporary digital design tools[5].

3) Translation Methods of Time-Space Compression Techniques in Landscape Historical Narration

Films realize time compression through flashbacks, dissolves, subtitles and other techniques, enabling historical events to unfold within limited narrative duration.

Landscape historical narration faces the same challenge of time-space compression: how to enable the public to perceive hundreds of years of historical evolution within limited physical space?

Traditional methods relying on inscribed plaques and sculpture groups deliver low narrative efficiency.

New media technologies make time-space compression in landscapes feasible: augmented reality overlays historical images onto real scenes to simulate "time flashbacks"; projection technology casts historical visuals onto ruin walls to realize "dissolve-style" historical reproduction. The dynamic projection of Along the River During the Qingming Festival at the 2010 Shanghai World Expo China Pavilion is a typical case of revitalizing ancient paintings into dynamic image narration, attracting over one million individual visits[6].

C. INTERVENTION PATH OF AI-ASSISTED NARRATIVE ANALYSIS TOOLS IN LANDSCAPE NARRATIVE RESEARCH

AI technology is reshaping the methodology of landscape narrative research from a tool perspective. During narrative analysis, natural language processing technology conducts semantic mining on massive tourist travel notes and review texts to identify high-frequency emotional vocabulary and spatial perception patterns, providing data support for narrative theme extraction. In the design stage, generative AI (e. g., Midjourney, Stable Diffusion image generation models) assists rapid visualization of cinematic scene scripts, accelerating the conversion efficiency from concepts to schemes[7].

In the evaluation stage, AI-driven behavior analysis platforms (e. g., computer vision pedestrian heat mapping systems) track visitors' stay distribution and path selection in landscape spaces in real time, supplying objective evidence for evaluating the effectiveness of narrative nodes. MIT Media Lab's Senseable City Lab has applied similar sensor and AI analysis systems to multiple urban public space projects, verifying the feasibility of AI-assisted narrative evaluation. This intervention path effectively combines design intuition with data positivism, substantially improving the precision of landscape narrative research[8].

It must be emphasized that the value of AI tools in landscape narrative research lies not in replacing designers' creative judgment, but in expanding designers' capacity to process complex information. The core advantage of generative AI lies in "rapid prototyping" — quickly translating designers' mental narrative imagery into visual schemes for multi-disciplinary team evaluation and discussion, rather than directly outputting final design results.

This human-machine collaboration model aligns closely with the multi-disciplinary integration characteristics of landscape design practice, and conforms to the mainstream academic positioning of AI-assisted creative design[9].

III. NARRATIVE FUNCTIONS AND LANDSCAPE INTEGRATION MECHANISMS OF NEW MEDIA INSTALLATION INTERACTION DESIGN

A. NARRATIVE CARRIER TYPES AND FUNCTIONAL HIERARCHY OF NEW MEDIA INSTALLATIONS IN LANDSCAPES

New media installations in landscape narration are not single-functional technical tools, but composite systems with hierarchical narrative carrier structures.

Based on their narrative functions and technical forms, landscape new media installations can be divided into three categories: environment-integrated, interaction-triggered and immersion-generating[10].

Environment-integrated installations are embedded into landscape physical environments with low intervention, such as LED light matrices presenting dynamic patterns responding to ambient light, or soundscape installations playing site-history-related environmental sounds in designated zones. Their narrative functions focus on atmosphere creation and background narration. Interaction-triggered installations take visitors' physical behaviors as narrative activation media: pressure-sensitive ground devices trigger projection content upon stepping, or near-field communication (NFC) tags push historical graphics and texts when mobile phones approach, with narrative functions of actively advancing plotlines.

Immersion-generating installations integrate VR/AR, holographic projection and spatial audio to construct enclosed or semi-enclosed immersive narrative environments, where visitors become "immersers" within narrative contexts, delivering the deepest narrative depth[11].

TABLE 1. Comparison of New Media Installation Types and Narrative Functions

Installation Type	Representative Technologies	Narrative Function	Visitor Role	Typical Cases
Environment-Integrated	LED Lighting, Soundscape System	Atmosphere Construction, Background Narration	Passive Perceiver	Gardens by the Bay Light Show, Singapore
Interaction-Triggered	Pressure Sensors, NFC, Somatosensory Recognition	Active Progression of Narrative Plots	Active Participant	High Line Interactive Installations, New York
Immersion-Generating	VR/AR, Holographic Projection, Spatial Audio	Construction of In-Depth Narrative Context	Narrative Immerser	teamLab Digital Art Landscapes

B. DESIGN MECHANISM OF NARRATIVE PROGRESSION DRIVEN BY INTERACTIVE BEHAVIORS

1) Perception Trigger Layer: Narrative Activation Logic of Somatosensory Recognition and Environmental Response

Initiating interactive narration requires a "trigger event" to shift visitors from sightseeing to narrative participation. The perception trigger layer captures visitors' positions, postures and movement directions in real time via depth cameras (e. g., Intel RealSense), millimeter-wave radars, ground pressure matrices and other sensors, converting these physical signals into activation instructions for narrative content[12].

The core design point of this mechanism lies in precise calibration of "trigger thresholds": overly sensitive triggers cause frequent accidental activation of narrative content, disrupting immersion; overly delayed triggers prevent visitors from perceiving system responses, eroding interactive inter-

est. Extending from Fitts' Law in human-computer interaction research, trigger response time should be controlled within 400 milliseconds to maintain visitors' perception of causal correlation (Reference: MacKenzie, I. S., Fitts' Law as a Research and Design Tool in Human-Computer Interaction, 1992). Environmental response design must also account for group triggering scenarios: when multiple visitors enter the sensing area simultaneously, the system should support multi-user collaborative narration rather than only responding to single individuals.

2) Content Generation Layer: Dynamic Filling of Narrative Plots via Real-Time AI-Generated Content

Traditional interactive installations rely on fixed preset material libraries for narrative content, limiting visitors' options and leading to homogenized experiences during repeated visits. Real-time AI content generation technology breaks this limitation: large language model (LLM)-based narrative engines dynamically adjust unfolding directions and detail depth of narrative plots according to visitors' movement trajectories, stay durations and preference selections; image generation models render visual scenes matching narrative themes in real time, enabling differentiated experiences within a unified narrative framework for each visit[13]. The core value of this mechanism lies in transforming landscape narration from a "broadcast mode" to a "dialogue mode" — the narrative system no longer unilaterally outputs fixed content, but establishes dynamic responsive relationships with individual visitors, delivering truly personalized narrative paths. This aligns with the core proposition of constructivist learning theory that "learners actively construct knowledge"[14].

Nevertheless, the application of real-time AI content generation in landscape contexts has boundaries. Narrative content for historical and cultural landscapes is constrained by historical facts, requiring AI-generated content to be "controlled generation" within knowledge bases reviewed by professional historians rather than unrestricted free generation. This demands a "Narrative Guardrails" mechanism at the system architecture level: structured representation of historical events, character relationships and timelines via Knowledge Graphs, within which AI generation engines produce narrative variants, balancing personalized experience with historical authenticity. This "controlled generation" model constitutes the core principle for responsible application of AI technology in cultural heritage landscape narration.

3) Emotional Feedback Layer: Paths for Multi-Sensory Output to Strengthen Narrative Emotional Resonance

The generation of narrative emotional resonance relies on coordinated activation of multi-sensory channels. Beyond vision-dominated traditional landscape narration, the emotional feedback layer of new media installations should systematically integrate auditory, tactile and even olfactory dimensions. Research indicates that audio-visual collaborative experiences boost subjects' memory retention of narrative content by approximately 40% compared to visual stimulation alone[15]. In emotional feedback design for landscape new media installations, spatial audio systems adjust sound field directions in real time as visitors move, creating an immersive effect of "sound following the body"; vibrating floor devices transmit low-frequency vibrations to visitors during narrative climaxes to activate tactile channels; simulated plant or soil scents for specific historical scenes further awaken site memory. Multi-sensory collaborative emotional feedback design is the core competitive advantage distinguishing new media installations from ordinary information display systems[16].

C. USER DATA COLLECTION AND INTELLIGENT ADAPTATION OF NARRATIVE PATHS IN LANDSCAPE INSTALLATION INTERACTION

Sustained optimization of landscape interactive systems depends on systematic collection and analysis of user behavior data. Three categories of data sources can be integrated at the data collection stage: first, sensor behavior data (stay duration, movement trajectories, interaction frequency), reflecting visitors' attention levels toward different narrative nodes; second, questionnaire feedback data capturing visitors' subjective emotional experience and narrative comprehension; third, eye-tracking data revealing visitors' attention distribution across visual content.

Based on the above multi-source data, AI adaptation engines identify "experience breakpoints" within narrative paths — spatial nodes where visitor attention drops sharply, stay time is abnormally short or interactive behaviors are interrupted. Targeted optimization of content and forms is implemented for breakpoints, forming a closed-loop iteration mechanism of "collection — analysis — optimization — re-verification". Drawing on agile development iteration concepts, this mechanism converts optimization processes originally dependent on designers' subjective judgment into data-driven objective workflows, greatly improving the reliability of design decisions[17].

IV. INTEGRATED DESIGN METHODOLOGY FOR CINEMATIC LANDSCAPE NARRATION AND NEW MEDIA INTERACTION

A. NARRATIVE THEME EXTRACTION AND SCRIPT TRANSLATION OF SCENES—CONSTRUCTION PROCESS FROM CULTURAL CORE TO SPATIAL SCRIPT

The starting point of cinematic landscape narrative design is extracting thematically compelling themes from the site's cultural core, analogous to extracting the "Story Core" in film scriptwriting: identifying core propositions that connect all scene elements and trigger emotional identification. Identification of cultural cores requires comprehensive consideration of the site's historical context, natural characteristics and social memory, forming a narrative theme matrix through literature research, field investigations and stakeholder interviews.

After theme confirmation, designers translate abstract cultural propositions into concrete "Spatial Scripts".

Referencing cinematic storyboard structures, each narrative node within the landscape is assigned scene atmosphere (visual tone, lighting conditions), plot content (historical events, ecological stories), interaction modes (trigger mechanisms, installation types) and emotional objectives (curiosity, contemplation, empathy). This script translation process converts vague conceptual design intentions into executable design instructions, providing a unified basis for subsequent multi-disciplinary collaboration[18].

FIGURE 2. Schematic Diagram of Cinematic Landscape Narrative Design Process

In practical operation, construction of the narrative theme matrix can be deepened via Emotional Mapping methods.

Emotional Mapping corresponds different zones of the site to specific emotional experience objectives: entrance zones correspond to "curiosity and anticipation", core ruin zones to "shock and awe", epilogue zones to "reflection and belonging". Through Emotional Mapping, designers complete macro planning of narrative rhythm at the spatial layout stage, ensuring the overall narrative curve features distinct undulating structures rather than flat information accumulation. Creation of Emotional Mapping must incorporate target audiences' cultural backgrounds and psychological expectations, utilizing Empathy Map tools from user research to reversely deduce required narrative intensity and emotional trigger mechanisms for each node from visitors' perspectives. This enables spatial scripts to center on "visitor experience" rather than solely "designer intention".

B. CONSTRUCTION STRATEGIES FOR MULTI-LEVEL NARRATIVE SPACES

Drawing on the narrative hierarchy theory proposed by interactive narrative scholar Marie-Laure Ryan, construction of cinematic narrative landscape spaces can also be divided into three progressive dimensions: formal layer, interaction layer and cognitive layer, which jointly form a complete narrative experience structure from shallow to deep.

1) Formal Layer: Cinematic Lens Thinking Guiding Landscape Visual Composition and Light & Shadow Design

The formal layer constitutes the sensory foundation of narrative experience. Application of cinematic lens thinking in landscape visual composition manifests in three dimensions: composition framing, depth of field relationships and light & shadow narration.

In composition framing, designers may borrow the cinematic "frame-within-frame" technique, utilizing landscape wall openings, tree trunks framing views or architectural doorways to create natural "camera frames" for core landscape elements, strengthening the dramatic quality of visual focuses. For depth of field, hierarchical treatment of foreground, middle ground and background endows landscape spaces with wide-film depth, generating a spatial experience for visitors of "scenes extending infinitely into the distance". In light & shadow narration, daylight analysis tools (e. g., Rhino Grasshopper sunlight simulation) assist designers in predicting light & shadow forms at specific times, incorporating the textural quality of the "Golden Hour" into narrative design so that the same space carries different narrative moods at different times of day[19].

2) Interaction Layer: Non-Linear Narrative Path Design and Layout of Multimedia Installation Nodes

The interaction layer marks the critical interface where visitors shift from passive perception to active participation.

Design of non-linear narrative paths in landscapes abandons single preset visiting sequences, instead setting multiple optional branch lines under a main narrative framework, where visitors' route selections constitute active intervention in narrative direction[20].

Layout of multimedia installation nodes follows the principle of narrative rhythm: high-density interactive nodes concentrate in narrative climax zones, while low-density or installation-free zones serve as narrative buffers to avoid perceptual fatigue caused by sustained high-intensity stimulation. Visual or auditory connecting clues should exist between installation nodes to maintain internal narrative coherence for visitors traveling along different paths.

The core difficulty of non-linear path design lies in balancing "narrative integrity" and "path freedom".

Excessively fragmented branch narratives may disorient visitors lacking overall narrative clues; overly rigid main narratives negate the significance of non-linear design. An effective solution introduces the concept of "Narrative Anchors": several mandatory nodes are set within the non-linear path network to carry core narrative information, ensuring visitors receive essential content for a complete narrative regardless of route choice; branch nodes deliver supplementary, emotion-deepening narrative content that enriches rather than sustains the overall narrative structure.

3) Cognitive Layer: Personalized Tour Routes and AI-Driven Content Pushing Mechanisms

The cognitive layer represents the final stage where narrative experience transforms into meaning construction. Realization of personalized tour routes relies on precise identification of visitor types and matching content. Through short pre-visit preference questionnaires (age group, cultural background, interest fields) or real-time collection of behavioral data during visits, AI pushing engines dynamically adjust content depth and presentation forms for different

narrative nodes: image-based, gamified content for child visitors; document-level historical materials for history researchers; emotional story narration for ordinary citizens.

This personalized mechanism upgrades landscape narration from "public broadcast" to "private narration", maximizing the depth of narrative resonance for each visitor. User-generated content (UGC) mechanisms further encourage visitors to share personal narrative experiences on social platforms, forming self-diffusion of narrative communication.

C. STANDARDIZED CONSTRUCTION OF DESIGN PROCESSES—FROM DEMAND ANALYSIS AND SCRIPT WRITING TO SCENE CONSTRUCTION AND ITERATIVE OPTIMIZATION

Standardized design processes serve as the organizational foundation guaranteeing quality for integrated cinematic landscape narration and new media interaction.

The complete workflow contains four core stages:

Demand Analysis Stage: Big data technologies collect online reviews and behavioral data of target audiences, combined with field surveys and stakeholder interviews to form User Personas and a site narrative demand list.

Script Writing Stage: Based on narrative themes, storyboard translation of landscape narrative scripts is completed, clarifying narrative content, interaction modes, technical carriers and emotional objectives for each spatial node to form a "Landscape Narrative Storyboard Table" executable by multi-disciplinary teams.

TABLE 2. Example of Landscape Narrative Storyboard Script (Taking Historical Cultural Landscapes as a Case)

Node No.	Spatial Location	Narrative Content	Interaction Mode	Technical Carrier	Emotional Objective
N-001	Entrance Plaza	Introduction to site historical evolution	Somatosensory trigger	LED Ground Projection	Curiosity / Anticipation
N-002	Historical Ruin Zone	Reproduction of historical event scenes	AR scan trigger	Mobile AR Application	Shock / Awe
N-003	Core Narrative Corridor	Multi-branch historical storylines	Touch screen selection	Interactive Touch Wall	Immersion / Empathy
N-004	Climax Experience Zone	panoramic historical scenes	somatosensory interaction	Holographic Projection + Spatial Audio	Emotional Peak
N-005	Epilogue Garden	Connection between personal memory and site memory	UGC message interaction	Digital Message Installation	Belonging / Reflection

Scene Construction Stage: Integrate design outcomes from the formal, interaction and cognitive layers to complete installation assembly, system debugging and content loading. Small-scale user testing verifies the integrity of narrative workflows and fluency of interaction logic.

Iterative Optimization Stage: Collect eye-tracking data, questionnaire data and sensor behavioral data to identify narrative breakpoints, implement content adjustments and system upgrades based on data feedback, establishing an agile iteration mechanism for continuous operation.

V. DESIGN PRACTICE VERIFICATION AND EFFECT EVALUATION

A. CASE ANALYSIS OF INTEGRATED CINEMATIC NARRATION AND NEW MEDIA INSTALLATIONS IN TYPICAL LANDSCAPE PROJECTS

This paper analyzes the digital narrative practice of Liangzhu Ancient City Ruins Park (opened 2019, inscribed as a World Cultural Heritage) in Liangzhu Cultural Village, Hangzhou as a case study.

The project introduces multimedia installations within a 5,000-year-old ruin landscape, translating remote ancient urban civilization into perceptible spatial experiences for the public via cinematic narrative techniques. At the formal layer, the project adopts a light & shadow narrative strategy utilizing rammed earth ruins as "natural film screens". Night projections cast 5,000-year-old totem patterns and urban construction scenes onto ruin walls, leveraging the inherent historical texture of ruins to strengthen the historical weight of visual narration. At the interaction layer, the AR tour application "Light of Liangzhu" allows visitors to overlay digitally restored ancient city architecture onto real landscapes via mobile phone screens, realizing "montage overlay of history and reality". At the cognitive layer, the system automatically pushes historical explanations of varying depths based on visitors' stay behaviors.

The core value of this case lies in that cinematic narrative techniques do not obscure the material authenticity of ruins, but reinforce the narrative dimension of ruins through digital overlay. This is the key principle distinguishing cinematic landscape narration from pure digital entertainment: narration serves the site rather than replacing it.

B. AUDIENCE EXPERIENCE EVALUATION METHODS—APPLICATION OF QUESTIONNAIRES AND EYE-TRACKING EXPERIMENTS IN VERIFYING LANDSCAPE NARRATIVE EFFECTS

A mixed research method integrating quantitative and qualitative analysis is adopted for effect evaluation, combining questionnaire surveys and eye-tracking experiments.

For questionnaire design, referencing Edward Tufte's data visualization principles, Likert five-level scale items are designed around three dimensions: narrative information communication efficiency, emotional resonance intensity and spatial orientation clarity to collect visitors' subjective evaluation data.

In eye-tracking experiments, a Tobii Pro eye tracker tests 20 subjects to record fixation hot spot distribution, average fixation duration and sight trajectories across landscape narrative installation interfaces. Experimental results show that placing core narrative information of installation visual content in the upper-central area of the frame increases fixation concentration by approximately 35%; zones with historical image cues record an average 42% longer fixation duration than text-only zones, demonstrating that image-based narrative carriers deliver significantly higher information communication efficiency than text-only carriers.

TABLE 3. Core Statistical Indicators of Eye-Tracking Experiments ($n = 20$)

Test Visual Type	Average Fixation Count	Average Fixation Duration (ms)	Central Zone Fixation Ratio (%)	Historical Image Zone Fixation Duration Ratio (%)
Mixed Text & Image (Group A)	28.4	3120	52.3	61.8
Text-Only (Group B)	19.6	2180	48.7	—
Image-Only (Group C)	24.1	2870	67.4	78.2
Panoramic Immersive (Group D)	35.7	4340	43.5	85.6

Data indicates panoramic immersive installations achieve optimal total fixation duration and attention toward image zones, yet low central concentration — consistent with the full-spread characteristic of immersive content, where visitors actively scan the entire scene instead of focusing on single focal points. This confirms the comprehensive advantage of immersive narration in mobilizing visitors' attention.

C. DESIGN FEEDBACK AND AI-ASSISTED ITERATIVE OPTIMIZATION MECHANISM BASED ON EVALUATION DATA

The value of evaluation data lies in elevating narrative optimization from the level of "designer intuition" to "data positivism". The operational logic of the AI-assisted iterative optimization mechanism is as follows: first, the AI analysis engine cross-compares three categories of data to identify experience disparities among different visitor types at identical narrative nodes; second, for breakpoint nodes, the AI engine proposes content adjustment recommendations based on historical optimization case libraries, including depth downgrade/upgrade of narrative content, adjustment of installation trigger modes and reinforcement of path guiding clues; finally, adjusted schemes are implemented in the next operational cycle, with data collected again for comparative verification to form a continuous iterative optimization closed loop.

The key innovation of this mechanism lies in introducing AI pattern recognition capacity into the post-evaluation stage of landscape design, breaking the efficiency limitation of traditional post-evaluation relying on manual data interpretation by designers, and endowing narrative landscape systems with self-learning and adaptive optimization characteristics.

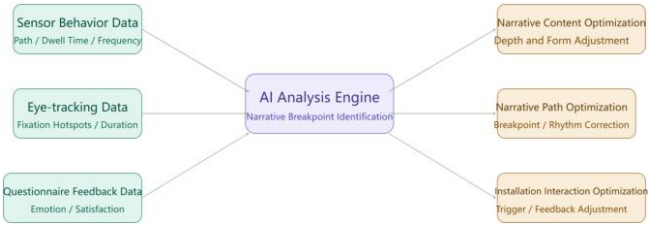

FIGURE 3. Schematic Diagram of AI-Assisted Iterative Optimization Mechanism Driven by Evaluation Data

VI. CONCLUSION

The narrative transformation of landscape environmental design represents an inevitable trend for spatial design disciplines in the digital age.

The in-depth integration of cinematic narrative theory and new media installation interaction technologies provides a systematic framework for constructing landscape narration: a complete logical closed loop is formed across links from cultural core extraction and spatial script translation, multi-level narrative space construction to data-driven iterative optimization. The research verifies actionable translation paths for cinematic narrative techniques including montage logic, viewpoint control and time-space compression within landscape design contexts. Meanwhile, the three-layer interaction mechanism of perception triggering, AI content generation and multi-sensory emotional feedback effectively empowers dynamic and personalized expression of landscape narration. The core value of this integrated paradigm lies not in technical stacking, but in a philosophical shift of design centered on narration, oriented toward experience and grounded in data. In the future, with continuous advancement of generative AI and spatial computing technologies, landscape narrative systems will further evolve toward real-time generation, in-depth personalization and multi-sensory immersion. Designers' roles will shift from shapers of spatial forms to screenwriters and system architects of narrative experiences.

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