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Mechanisms and Logic of AIGC Empowering Theatrical and Film-Television Concept Design

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ABSTRACT
In the digital age, theater, film and TV concept design not only translates visual narratives but also needs to boost creative efficiency and precision. However, traditional methods face growing limitations in handling complex scenes and iterating materials. AIGC, with strengths in data and image processing, brings new opportunities to this field.Most current AIGC research in film and TV focuses on special effects and efficiency, while there is an obvious gap in exploring concept design's logical transformation mechanism and creative control system. Thus, this study is of great theoretical and practical value: theoretically, it fills gaps and enriches the digital-era film-television creation theoretical system by analyzing AIGC-concept design integration; practically, it offers designers ways to balance AIGC and original design, improving concept design quality and efficiency. Focused on technical foundation, creative logic and optimization path, the study analyzes AIGC's core technical modules and evolution, concept design logic changes driven by technology, as well as application solutions and development paths, aiming to promote in-depth, healthy integration of the two.

KEYWORDS
Theatrical and film-television concept design; AIGC technology; Digital age; Creation logic; Creative control; Intelligent design

1 Introduction

In the digital age, theatrical and film-television concept design must simultaneously fulfill two roles: transforming script text into concrete visual narratives and enhancing creation efficiency and precision. However, with the audience's increasing expectations for visual effects, the limitations of traditional concept design in constructing complex scenes, processing materials, and achieving rapid iteration have become increasingly prominent. AIGC technology, with its powerful data analysis and image generation capabilities, has brought transformative opportunities to this field. Currently, research on AIGC in the film and television industry mostly concentrates on special effects generation (rapidly producing realistic elements to reduce costs and production cycles) and efficiency improvement (assisting in material screening and preliminary editing). Nevertheless, there is a significant gap in the concept design segment—especially in studies on "how AIGC changes traditional creation logic" and "how to control its creative direction to align with film and television styles"—which fails to meet practical demands.

Therefore, this study possesses both theoretical and practical value: theoretically, it analyzes the integration mechanism between AIGC and concept design to fill research gaps and enrich the theory of film-television creation; practically, it provides designers with methods to balance technological application and original design, avoiding the loss of creativity and improving design quality. The study unfolds around three dimensions: the technical foundation dimension analyzes the core technical modules and application evolution of AIGC; the creation logic dimension explores the changes in design logic caused by technological intervention; and the optimization path dimension proposes solutions to application problems, ultimately promoting in-depth and healthy integration between AIGC and theatrical/film-television concept design.

2 Technical foundation and application evolution of AIGC in theatrical and film-television concept design

2.1 Core technical modules: intelligent support units for concept design

AIGC technology participates in the entire process of theatrical and film-television concept design by relying on the collaboration of multiple intelligent units, gradually becoming a core force in concept design. This section focuses on four categories: Generative AI Technology: Represented by programs such as Midjourney, Stable Diffusion, and Jimeng, it serves as the core engine of design. Based on massive visual materials, it generates diverse schemes for scenes, characters, and props according to keywords and style references input by designers, enabling rapid divergence of creativity. Computer Vision Technology: Including intelligent matting, image restoration, style transfer, and dubbing editing, it provides support for material processing. It can accurately extract character or prop elements from scenes, restore old photos, and improve overall adaptability while solving key pain points. Language Processing Technology: Realizing the accurate transformation from textual demands to visual schemes, this technology can parse descriptions from designers, playwrights, and directors into recognizable visual references, thereby stimulating the evolution of concepts and works.

Multimodal Fusion Technology: Integrating data such as images, text, and voice to support integrated operations throughout the entire design process, enhancing the coherence of the workflow.

2.2 Stages of application evolution: transformation from single assistance to full-process participation

The application of AIGC in theatrical and film-television concept design can be divided into three stages:

Initial Auxiliary Phase (2018-2020): Focused on single technical tools to reduce the cost of repetitive work. For example, basic matting tools were used to process image materials, and simple dubbing tools to generate audio clips. Although their functions were limited and unable to meet complex demands, they reduced the time designers spent on repetitive tasks, laying the foundation for subsequent development.

Efficiency Improvement Phase (2021-2022): The emergence of multi-technical integrated platforms (e.g., Runway ML, Adobe Firefly) integrated image processing, voice processing, and other technologies into an integrated auxiliary system. In terms of design workflow, multiple links such as material screening and image editing could be completed on a single platform without frequent tool switching. For instance, when creating scene concept designs, the platform could continuously complete material extraction, optimization, dubbing, and subtitle production. In terms of material integration, it could uniformly manage materials from different sources and formats, establish material libraries, and realize efficient utilization and collaborative sharing, significantly improving design efficiency.

Creative Intervention Phase (since 2023): With the in-depth application of generative tools such as Midjourney and Stable Diffusion, AIGC no longer merely assists in basic tasks but actively participates in the creative conception process. Designers input keywords and style requirements (e. g., "fantasy alien scene with floating mountains, glowing plants, exotic creatures, and rich and brilliant colors"), and the tools can quickly generate dozens or even hundreds of diverse schemes covering characters, scenes, and props. Designers can draw inspiration from these schemes, screen and optimize them, and further modify details (e. g., adjusting color matching and character shapes) to align with film-television narratives and styles. This has also promoted the diversified development of concept design, providing more options for film-television creation and facilitating industry innovation.

3 Case analysis of AIGC empowering theatrical and film-television concept design

3.1 Case background

Everything Everywhere All at Once, a film integrating sci-fi, comedy, and fantasy elements, takes the "multiverse" as its core setting and constructs a complex narrative system containing more than 20 parallel universes. Its visual design not only needs to fulfill the basic task of "presenting differentiated worldviews" but also undertakes in-depth demands such as dynamic narrative and absurd elements. The film's application of AIGC breaks through the limitation of "technology as a mere tool" in traditional film-television design, realizing the integration of technology and aesthetics. From an academic perspective, it can be summarized into the following systematic design innovations and underlying strategies, providing a reference theoretical and practical paradigm for "narrative-driven AIGC application in film and television."

For example, segments such as the "Kung Fu Universe," "Hot Dog Finger Universe," and "Animation Universe" placed extremely high demands on concept design: each universe needed to have a unique visual identity, while ensuring the logical consistency of visual connection between different universes. Meanwhile, it was necessary to realize the creative implementation within a limited production budget. Traditional concept design relied on manual drawing and repeated revisions, making it difficult to efficiently meet the diversity and complexity demands of multi-universe scenes. Therefore, the production team introduced AIGC technology, focusing on generating multi-universe scene styles, designing character variants, and adapting visual elements across universes—becoming a key support for the breakthrough in the film's visual style.

Figure 1 The Universe Where Fingers Evolve into Hot Dogs, Source: Internet

3.2 Application of AIGC technology in concept design

3.2.1 Differentiated generation of multi-universe scene styles

To meet the core demand of the "multiverse" setting, the production team used generative tools such as Midjourney

and DALL-E 2 to construct a "universe style parameter library," realizing the differentiated generation of visual styles for different universes by adjusting keyword combinations. For example, when designing the "Kung Fu Universe," the team input parameters such as "retro Hong Kong martial arts film style, neon signs, wet streets, film grain, high-contrast tones," and the generative tools quickly output a large number of scene schemes with Hong Kong-style martial arts aesthetics, including narrow alleys lined with signboards and martial arts training grounds in the rain—providing a basic framework for the final scene design. When designing the absurd "Hot Dog Finger Universe," the team input keywords such as "surrealism, soft texture, warm yellow tones, integration of daily objects with hot dog fingers," generating scene elements with fantasy humor (e. g., door handles and tableware shaped like hot dog fingers), effectively lowering the creative threshold for absurd style design. In addition, AIGC supported style iteration and optimization: when the team hoped the "Animation Universe" would combine Japanese anime and American cartoon styles, they added mixed parameters such as "Studio Ghibli's delicate brushstrokes + Disney's color saturation" to the generation instructions, quickly producing style schemes that met expectations and avoiding the time cost of repeated revisions in traditional design.

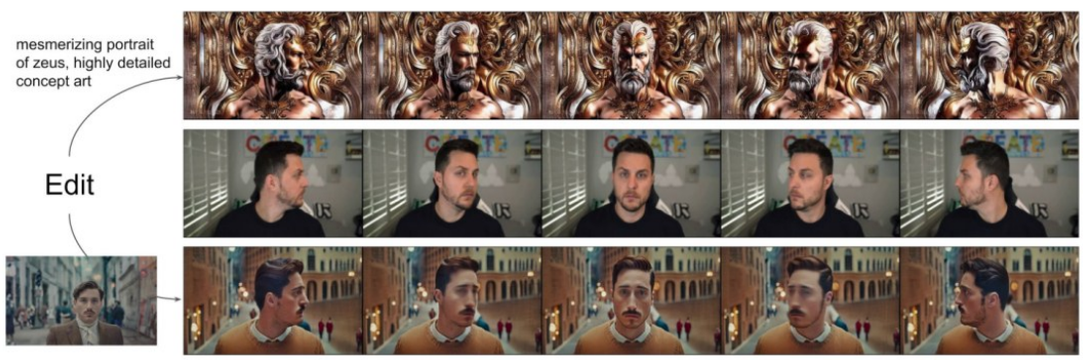

Figure 2 Example of guided video synthesiswhile preserving the structure of the input video (middle), source: internet

3.2.2 Character variants and cross-universe image adaptation

In multiverse films, character variant design must balance "differentiation" and "association": audiences should instantly distinguish a character's universe via visuals yet perceive their essential consistency through shared elements to avoid emotional fragmentation. Everything Everywhere All at Once solved this using AIGC with this logic:

Narrative-driven decomposition turned Evelyn's cross-universe differences into quantifiable visual variables. In the "Kung Fu Universe," she wore a mandarin-collar shirt with dragon embroidery, had defined muscles, and sharp eyebrows; in the "Movie Star Universe," a sequined couture dress, elegant posture; in the "Rock Universe," full rock texture, muted expression, and high grayscale.

AIGC's role is "stabilizing common elements + precisely adjusting variables." Unlike manual design, which risks losing commonalities, AIGC fixes core traits (Evelyn's facial ratio, round black-framed glasses) and varies clothing, posture, and makeup. This lets audiences instantly recognize the character yet grasp the setting—"recognize at a glance, understand at a glance"—while keeping the image narrative-consistent.

3.3 Existing problems and pain points

The application of AIGC in the multi-universe visual design of the film demonstrated significant value while revealing unresolved issues, mainly focusing on two aspects: First, some generated content showed a tendency of creative homogenization. Due to the reliance on general training models, the scene components of individual universes exhibited "familiar" visual effects, falling into an algorithm-driven creative echo chamber. Second, there was insufficient detail precision. For example, the part where the "Raccoon Chef's" paws grip kitchen utensils and the texture details of weapons in the "Kung Fu Universe" required secondary manual optimization by designers to meet film-television-level presentation standards—similar to the common detail flaws in AIGC-generated real-person style content. Third, style control was highly difficult. Due to the randomness of generation and algorithmic limitations, the visual style of some universes required repeated parameter adjustments to align with the "unified narrative tone of the multi-universe," increasing the cost of design communication. This is consistent with the common control challenges of AIGC in style customization.

4 Changes in creation logic of AIGC empowering theatrical and film-television concept design

The in-depth application of AIGC technology has not only changed the tools and methods of concept design but also fundamentally reconstructed the core logic of design, specifically reflected in changes in three dimensions: "process," "model," and "role." Restricted by tool efficiency and information processing capabilities, traditional theatrical and film-television concept design remained relatively rigid in terms of process advancement, creative production, and role

positioning. However, with its ability to efficiently integrate data and assist in creative generation, AIGC has broken this traditional framework, promoting concept design toward greater flexibility, collaboration, and precision.

4.1 Reconstruction of design process: from "linear progression" to "cyclic iteration"

Traditional theatrical and film – TV concept design followed a linear pipeline—needs analysis → sketching → detail refinement → finalization—with sequential, siloed stages relying on designer experience. Stable for simple scenes, it struggled with complex projects like multiverse worldbuilding and dynamic environments.

AIGC has replaced this linearity with human – machine cyclic iteration. Designers translate needs (e. g., "cyberpunk streets," "ink-wash xianxia") into prompts for tools like Midjourney or Stable Diffusion, generating multiple initial schemes. They then filter by narrative and production needs, using AIGC to add details (adjust architecture, lighting) or tweak style (retro texture, reduced tech elements). Crucially, AIGC links downstream technical parameters (modeling precision, VFX standards) for real-time validation. This iteration shortens cycles and resolves the "low efficiency, hard implementation" bottlenecks of the traditional process.

4.2 Transformation of creative production model: from "individual creativity-led" to "human-machine collaborative co-creation"

The creative production of traditional theatrical and film-television concept design highly relied on the designer's individual aesthetic accumulation and narrative comprehension ability, essentially following an "individual creativity-led" model. In this model, the generation, screening, and deepening of creativity all centered on the designer's experience. While it could reflect a distinct personal style, it also had limitations such as style solidification and excessive costs.

AIGC technology has promoted the transformation of the creative production model toward "human-machine collaborative co-creation." This does not mean replacing the designer's creative leadership but forming a complementary collaborative relationship between humans and machines through artificial intelligence and big data. Specifically, this collaboration is reflected in two aspects:First, AIGC provides "multi-dimensional material support" for creative generation. By integrating global film-television concept design databases (including scene and character designs of different styles and cultural backgrounds), it provides creative references that transcend the designer's individual cognitive boundaries. Second, AIGC reduces design costs. Designers do not need to complete full sketches; instead, they only need to convert preliminary creative concepts into prompts to generate visualized schemes through AIGC, facilitating rapid communication of core directions with the team. It is worth noting that "human-machine collaborative co-creation" is not a simple combination of "AIGC generation + designer revision" but forms a deep collaborative mechanism of human-machine co-creation, achieving dual improvements in quality and efficiency.

4.3 Adjustment of designer role positioning: from "illustrator" to "parameter manager and creative integrator"

In traditional theatrical and film-television concept design, the designer's role as an "illustrator" was essentially a product of "skill specialization" division in the industrial age. Their functions were confined to the execution end of visual production, requiring drawing skills to materialize creativity. However, after AIGC technology broke the boundaries of creation, the designer's transformation toward a "parameter manager and creative integrator" is an inevitable result of "creative specialization" division in the digital age.

As a "parameter manager," the core task is to convert narrative needs, visual styles, and production standards into a parameter system recognizable by AIGC, ensuring human leadership in human-machine collaboration. As a "creative integrator," the designer needs to integrate multi-dimensional materials generated by AIGC, the team's narrative demands, and technical standards of subsequent production, transforming scattered creative elements into a complete scheme that "aligns with narrative logic, possesses both artistic uniqueness and implementation feasibility." Essentially, this is an upgrade from a "single-skill executor" to a "coordinator of the design system," fully unleashing the theoretical and practical value of designers in human-machine collaboration.

5 Solutions to AI technology dependence in design creation

5.1 Technical dimension: constructing a "human-machine collaboration" system

The core of human – machine collaboration is the deep integration of technical tools and design cognition, not just efficiency gains. Zhejiang University's Tan Jianrong team notes that traditional CACD, being geometry-oriented and reliant on trial and error, struggles with incomplete information and cognitive ambiguity in concept design. In contrast, the human – machine cognitive collaboration model—using semantic recognition of needs and intelligent function – structure reasoning—renders abstract design thinking computable and machine-understandable, enabling cognitive-level adaptation beyond mere tool assistance.

Shanghai Jiao Tong University's Han Ting adds that collaboration should span the entire design process: AI handles

data collection and algorithm optimization, freeing designers for value-based, human-centered decisions. This prevents algorithm-driven homogenization, relieves technical constraints, and offers a practical collaborative framework.

5.2 Creative dimension: reshaping the designer-led original logic

The intervention of AI technology may lead to the decoupling of creative generation and value judgment, requiring mechanism design to establish the designer's core position. Professor Fan Ling from Tongji University emphasized in the "Design AI 2.0" theory that although generative AI can improve the novelty of creativity, it often encounters the problem of "decoupling of novelty and practicality"—its outputs may meet unconventional requirements but fail to align with brand positioning and actual user needs. This finding confirms the necessity of reshaping the original logic: designers need to participate in the AI generation process as "creative leaders," converting technical outputs into original achievements that meet design goals by setting constraints, screening core concepts, and infusing value connotations.

Professor Fan Ling further pointed out that the uniqueness of human creativity lies in its "tolerance for uncertainty," while AI is still limited by probabilistic algorithms. The original logic led by designers essentially uses "problem definition capabilities" to harness technical tools—first clarifying humanistic goals and core demands, then guiding AI to conduct scheme deduction, rather than allowing creative directions to be driven by algorithmic outputs.

5.3 Capability dimension: cultivating digital humanistic control ability

From the perspective of digital humanities, the core of technological optimization is not merely upgrading tool functions but realizing in-depth integration of technology and humanistic creation needs, making technology serve human creation logic. The ultimate ability to address AI dependence lies in the designer's dual mastery of technical tools and humanistic values. Technological optimization divorced from humanistic care will eventually deviate from the essence of design; the core of design should focus on human well-being rather than mere efficiency improvement. This view clarifies the core connotation of digital humanistic control ability: it is necessary to deeply integrate technical operation capabilities and humanistic cognitive capabilities, understanding both the generative logic and optimization boundaries of AI, and calibrating technical outputs with cultural context, user experience, and ethical principles. In addition, it is necessary to strengthen humanistic courses such as film-television narratology and visual aesthetics, helping designers establish associative cognition of finding narrative logic in scene design and highlighting aesthetic expression, ensuring that the technical achievements generated by AI always align with the humanistic core of the work.

6 Prospects and conclusion

This study focuses on the integration of AIGC and theatrical/film-television concept design, clarifying that its core technical modules (generative AI, computer vision, etc.) have evolved from single assistance (2018-2020) to full-process participation (since 2023). Taking Everything Everywhere All at Once as an example, it identifies the value of AIGC in multi-universe scene generation and character variant design. Meanwhile, the study reveals that AIGC has promoted the transformation of design logic from "linear process," "individual creativity," and "illustrator role" to "cyclic iteration," "human-machine collaboration," and "parameter manager role." It also proposes three paths— "human-machine collaboration system," "designer-led originality," and "cultivation of digital humanistic control ability"—to address the problem of technology dependence, possessing both theoretical gap-filling and practical guiding significance.

In the future, the development of AIGC in this field can focus on three directions:First, at the technical level, promoting the upgrade of multimodal fusion technology to realize seamless connection of multi-dimensional materials and improve the efficiency of design implementation; Second, at the industry level, establishing copyright norms for AIGC design achievements and clarifying the division of rights in human-machine co-creation; Third, at the educational level, strengthening the cultivation of designers' "technology + humanities" dual literacy to adapt to the needs of role transformation, ultimately realizing in-depth and healthy symbiosis between technology and creation.

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