

# Research on Coherence Optimization in E-commerce Video Advertising Generation Using AIGC

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**Abstract:** E-commerce video advertising is one of the primary means of e-commerce marketing, and the coherence of e-commerce video advertising directly affects the efficiency of information transmission. Current mainstream AIGC models tend to encounter issues such as visual stuttering, logical inversion, and excessive stiffness when generating long-sequence e-commerce advertisements, leading to narrative confusion and unclear content expression in video advertisements. This paper explores optimization strategies for enhancing the coherence of e-commerce advertising generation through literature review and case analysis. The results indicate that the optimization methods improve advertisement coherence and completion rates. This study provides an operational optimization path for the controllable generation of AIGC in e-commerce video advertising.

**Keywords:** AIGC technology; E-commerce video advertising; Coherence; Noise control; Logical coherence

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## 1. Introduction

The upgrading and iteration of AIGC technology have spurred the development of numerous video generation tools. These tools can quickly generate video advertisements based on product characteristics and user instructions. Compared to traditionally shot and edited advertising videos, AIGC-generated advertisements not only effectively save time and costs in video production but also meet the needs of e-commerce businesses to produce videos independently<sup>[1]</sup>. However, certain issues with the application of AIGC in e-commerce video advertising persist, with insufficient video coherence being a key obstacle to its widespread adoption. As a medium for promoting products, e-commerce video advertisements need to fully showcase product advantages, comprehensively convey product information, and attract audience attention through immersive experiences, thereby stimulating purchase intentions. Insufficient video coherence can affect the visual experience of audiences watching video advertisements, leading to an inability to understand

the brand concept conveyed by the product, thus reducing consumer patience and desire to purchase <sup>[2]</sup>. However, existing optimization methods mostly focus on single-frame advertising product images or short-sequence generation, lacking coherence optimization solutions for the long narrative logic of e-commerce advertisements. Therefore, this study's analysis of coherence issues in AIGC e-commerce video advertising generation holds practical value and theoretical significance.

## **2. Definition of core concepts**

### **2.1. The connotation of AIGC**

AIGC refers to technology that relies on artificial intelligence to generate diverse content. Its generation principle involves constructing large algorithmic models to accurately extract vast amounts of data and reorganize it according to instructions to form diverse information content such as text, video, and images that meet user needs. Compared to traditional information generation software, this technology system is more efficient and logical in information processing. Currently, AIGC has begun to be widely applied in e-commerce video advertising, where merchants only need to input product information and instructions regarding the style of the video to be generated through software, and the system will automatically generate product display videos <sup>[3]</sup>.

### **2.2. The connotation of video coherence**

Video coherence refers to the need for e-commerce video advertisements generated by AIGC to ensure smoothness and continuity in content and logical expression. Firstly, the connection and transitions between video frames should be coherent, ensuring content continuity between frames and a consistent style. Logical continuity is mainly manifested in the video's displayed content aligning with the scene, with narratives following conventional logic to avoid issues such as abrupt transitions and disjointed storytelling <sup>[4]</sup>.

## **3. Core issues in coherence of AIGC e-commerce video advertising generation**

### **2.1. Visual coherence issues**

Visual coherence is a fundamental requirement for e-commerce video advertising generation, but visual coherence issues are relatively common in AIGC video generation, mainly manifested as unsmooth frame transitions, obvious stuttering or frame skipping, making the viewing experience for audiences feel stiff and abrupt. This occurs because AIGC generates videos by integrating and splicing vast amounts of data information, making it difficult to accurately calculate timing during frame splicing, thereby affecting the smooth transition of videos. For example, in the generation of home appliance video advertisements, if the previous frame displays the appearance of a home appliance and the next frame abruptly switches to the appliance's circuit board, this disjointed display method lacks effective transitions and connections, seriously affecting the audience's perception <sup>[5]</sup>. Additionally, AIGC-generated videos also suffer from issues with the connection of visual elements. This is because AIGC may have low accuracy in extracting product information, leading to information deviations during video generation. For instance, in clothing product video displays, if the previous frame shows white clothing and the next frame suddenly changes to black clothing, it results in inconsistency in the products displayed in the video. Apart from inconsistencies in product visuals, there may also be inconsistencies in character images, and such severe video misalignments

can affect the audience’s trust in the product. Furthermore, chaotic visual styles are also one of the main issues contributing to video incoherence. E-commerce video advertisements need to have a specific theme during the product display process, and all frames should conform to the theme style <sup>[6]</sup>. However, AIGC’s limited ability to recognize visual styles can easily lead to chaotic video styles. To provide a clearer and more explicit analysis of visual coherence issues, they are summarized in **Table 1**, which presents the types of issues, their manifestations, and causes, along with survey parameters.

**Table 1.** Visual coherence issues

Issue Type	Manifestation	Cause
Visual Coherence	Stuttering (frame rate <20fps), distorted image alignment (18%)	Timing error exceeding 0.3s, information extraction accuracy below 75%
Logical Coherence	Scene jumping (interval >1s), narrative reversal (probability ≥22%)	Logical information reading accuracy below 68%
Technology-derived Issues	Audio-video desynchronization (0.2s), noise interference and distortion (≥15%)	Multimodal alignment rate below 72%, immature technology

### 3.2. Logical coherence issues

In terms of the coherence of AIGC-generated e-commerce video advertisements, narrative logic is key to ensuring video coherence. According to the nature of e-commerce video advertisements, the narrative should first stimulate the audience’s willingness to watch through visually appealing scenes and then unfold the narrative with the product as the carrier to achieve the effect of promoting the product’s highlights. However, AIGC struggles to deeply interpret the advertising design logic in generating e-commerce video advertisements, leading to inverted narrative logic <sup>[7]</sup>. For example, in an e-commerce video advertisement for a toy, the introduction starts with the toy’s specifications, followed by a switch to scenes of children playing with it, and then a display of the toy’s image. This narrative approach contradicts the conventional logic of audiences watching videos, resulting in confused information conveyed by the video advertisement and limited promotional effectiveness. Meanwhile, scene transitions are also crucial for maintaining logical coherence in video advertisements. Reasonable scene transitions can ensure the smoothness of product promotion in the video, allowing the audience to more deeply feel the product’s performance, value, etc., while watching. However, if the scene logic is weak and overly abrupt, the audience will be unable to understand the focus of the advertisement, thereby reducing their willingness to continue learning about the product.

### 3.3. Coherence issues derived from technical aspects

The coherence issues in AIGC-generated e-commerce video advertisements are related to insufficient information processing capabilities of the technology. Firstly, AIGC has limited control over temporality in video modeling. Videos are formed by connecting countless frames in a specific time sequence. AIGC has certain defects in temporal processing of videos, making it prone to temporal confusion or breaks when generating longer videos. Although current AIGC technology has been improved for temporal processing, such as the Sora model being able to basically maintain temporal order, it still lacks precision in detail processing, easily leading to stiff video transitions <sup>[8]</sup>. Moreover, AIGC has insufficient noise interference handling capabilities. Noise interference in video information can affect the image quality and continuity of the video, resulting in distorted or ghosted images, thereby affecting the display of product information in

the advertisement. For example, in a video advertisement for a mobile phone, if there are issues of ghosted or unclear images when showcasing the phone's camera function, it will not only fail to serve as promotion but may also mislead the audience's judgment of the product's performance. Additionally, AIGC has insufficient multimodal adjustment capabilities. Video advertisement generation requires information combination from multiple aspects such as images, audio, and text, and ensuring the synergy of various information. However, due to the immature current multimodal processing technology, issues such as audio-visual disconnection and mismatch between text and images easily occur in video advertisements, affecting the audience's viewing experience and the effective transmission of advertisement information.

## **4. Coherence optimization strategies for AIGC-generated e-commerce video advertisements**

### **4.1. Coherence optimization principles and objectives**

In adjusting the coherence of AIGC-generated e-commerce video advertisements, it is necessary to strengthen coherence adjustments based on the generation principles and core objectives of video advertisements<sup>[9]</sup>.

The core principles of e-commerce video advertisements can be summarized in three aspects:

- (1) Adhere to the user-centric principle: The generation of AIGC e-commerce video advertisements should start from the audience's video-watching thinking habits to ensure the unity of video content, logic, and style. For example, capturing the audience's needs at the beginning of the video to attract them to continue watching, thereby improving the completion rate of the video advertisement;
- (2) Ensure the adaptability of the video advertisement to the product's commercial characteristics: The content of the video advertisement should revolve around the product's selling points and performance introductions to ensure the effectiveness of information transmission in the advertisement and avoid a contrast between the video style and the product that affects the audience's interest in learning about the product;
- (3) Ensure the feasibility of the technology: In generating AIGC e-commerce video advertisements, it is necessary to compress technology upgrade costs and simplify technology operation processes to ensure that the upgraded technology can meet the generation needs of small and medium-sized e-commerce advertisements.

Furthermore, the core objectives of e-commerce video advertisements can also be adjusted from three levels:

- (1) Focus on solving coherence issues in video advertisements in terms of vision and logic to ensure clear and smooth expression of video content that conforms to the audience's thinking mode when watching videos;
- (2) Improve the original video advertisement generation model and continuously optimize video generation technology and logic to eliminate AI stitching traces;
- (3) Promote the deep integration of AIGC and e-commerce video advertisements, build professional digital models tailored to the needs of e-commerce video advertisements, and improve the advertisement material library to enhance the generation efficiency of e-commerce video advertisements.

### **4.2. Modeling optimization and noise control**

The coherence issues in AIGC-generated e-commerce video advertisements are directly related to immature underlying technologies. Therefore, in terms of coherence optimization, it is necessary to strengthen

technology optimization to effectively solve the issue of insufficient video coherence. Firstly, optimize temporal modeling technology. The improvement of this technology can make the content and logic of the video clearer. During the technology improvement process, Transformer and Sora models can be used to further decompose the video, then uniformly sort the images in chronological order, and strengthen control over gradient disappearance (such as using the LSTM gating mechanism) to meet the needs of high-frequency image updates in e-commerce video advertisements<sup>[10]</sup>. In addition, adopt “look-back” and “CoNo” mechanisms to promote accurate prediction and control of video segment connection nodes to avoid video connection breaks. Meanwhile, strengthen data set processing and training of the AIGC video generation model to improve its temporal logic analysis capabilities in data extraction and stitching, thereby ensuring the coherence of e-commerce video advertisement connections. Additionally, strengthen noise control upgrades. In terms of noise control, it is necessary to ensure that the quality of video generation samples is noise-free to reduce noise interference in subsequent processing. Meanwhile, use Deform technology to handle video transitions to retain sufficient transition duration when switching between two video frames, preventing overly abrupt video images. Furthermore, it is necessary to process the video frame rate parameters and control them at around 24 fps to prevent video playback stuttering.

### **4.3. Visual and logical coherence optimization**

In generating e-commerce video advertisements using AIGC, it is necessary to strengthen visual and logical coherence optimization. To ensure visual coherence in videos, standardized management of video generation materials should be carried out in AIGC applications to ensure the consistency of the styles of products, characters, and scenes in video generation instructions. An automatic verification mechanism should be introduced into the system. This mechanism can mark content with inconsistent styles and then adjust the product style through manual modifications and command optimizations to ensure the unity of styles of various elements in the video. Meanwhile, adjust video transitions and reduce video switching frequency. Smoother image switching can be achieved through image fading and other methods. Additionally, to ensure logical coherence in videos, optimization should be carried out from aspects such as the narrative of video content and the presentation of product highlights.

In video narratives, conventional advertising logic should be used as the core. First, enhance the attractiveness of the video, then provide a foundation for product information transmission, and finally display product information to form a call to action for product purchases. Additionally, the presentation of product information in the video should be focused and not involve the stitching and superposition of various information to ensure the clarity of logical selling points and the adaptability of products to scenes, avoiding affecting the promotional effect.

### **4.4. Tool and evaluation feedback optimization**

The generation advantages of AIGC e-commerce video advertisements are manifested in aspects such as low operational thresholds and strong targeting. Therefore, in subsequent coherence technology improvements, this should still be the core. In technology upgrades, the characteristics of e-commerce advertisements should be used as the core to simplify the video advertisement generation process. For example, after logging into the system page, e-commerce businesses only need to input information such as product type, name, parameters, and core selling points through voice or text, and the system can automatically generate video advertisements. Furthermore, technology upgrades should incorporate a verification module to self-check and optimize video advertisement content, reducing subsequent e-commerce self-checking procedures and improving video advertisement generation

efficiency. Meanwhile, build video advertisement generation models at different levels. For example, some high-end e-commerce businesses can choose customized video advertisement generation services. The materials in this service are of higher quality, and the style and transition methods are customizable to ensure video quality. Additionally, build an AIGC e-commerce video advertisement evaluation feedback mechanism. The system can automatically detect satisfaction evaluations of video generation and use them as references for subsequent model and algorithm optimizations to assist in improving the coherence of e-commerce video advertisements.

## **5. Practical testing and effect verification of coherence optimization strategies**

To ensure that the coherence optimization strategies for AIGC e-commerce video advertisements are effective and implementable, three categories of e-commerce businesses were selected for empirical testing in the study. By comparing before and after video coherence optimization, data such as user experience, advertisement conversion rates, and e-commerce user feedback were collected to analyze the optimization effectiveness of video advertisement coherence.

### **5.1. Testing plan**

In the study, three e-commerce businesses in the apparel, home appliance, and digital product categories were selected to participate in the AIGC video advertisement coherence optimization test. Before the test, the video advertisements of these three e-commerce businesses all had issues such as abrupt image transitions, logical confusion, and stuttering. During the test, AIGC technology was used to remodel the advertisement content, while strengthening noise control and logical optimization. A verification module was also used to correct incoherence issues in short video advertisements.

### **5.2. Practical testing results**

Through testing by the three e-commerce businesses, the coherence optimization results of e-commerce video advertisements are as follows:

First, objective indicators of video coherence. The video frame rate was adjusted (24–30fps) during the test to make image transitions more stable and effectively solve the issue of image stuttering. Meanwhile, the temporal error of images was reduced from 0.3s to 0.1s, improving video coherence. Additionally, the logical accuracy rate of advertisement videos significantly increased (from 68% to 82%), and noise interference decreased (by 5%).

After that, the subjective indicators of video coherence. In the survey feedback on optimized video advertisements, the three e-commerce businesses scored the video satisfaction at 9.7 points, 9.8 points, and 9.7 points (out of 10 points), respectively, which significantly increased compared to the previous scores of 4.5 points, 5.1 points, and 5.3 points. It can be seen that users are very satisfied with the video coherence optimization. Meanwhile, in the scoring of the audience's video-watching experience, the average score of the audience before optimization was 4.6 points (out of 10 points), while the average score after optimization was 7.5 points, with a significant increase in score, indicating that the audience's video-watching experience has improved. Moreover, the completion rate of advertisement videos significantly increased (from 32% to 63%). The change in data indicates that the videos have become more attractive to the audience. Additionally, the conversion rate of video advertisements can be divided into regular conversion and blockbuster conversion. Among them, the regular conversion rate increased by 97%, and the conversion rate of blockbuster videos increased to four times the original. It can be seen that the coherence optimization of

e-commerce video advertisements has significant effects and can be widely promoted and applied.

## 6. Conclusion

In summary, the coherence of AIGC e-commerce video advertisements is related to the viewing experience of the advertisements and the quality of product information transmission. However, from the current generation status of AIGC e-commerce advertisements, the issue of insufficient video coherence still widely exists, leading to deviations in information transmission in videos and affecting the audience's interest in learning about products. To improve the coherence of e-commerce video advertisements, improvements still need to be made in aspects such as logical optimization, technology upgrades, and feedback mechanism construction. In the future, research on the continuity of AIGC e-commerce video advertisements can be deepened and reformed from deeper-level technical means such as temporality and multimodality to ensure the quality of e-commerce advertisement video generation.

## Disclosure statement

The authors declare no conflict of interest.

## References

- [1] Zhang J, Zhang R, 2024, Application and Optimization of AI Dialogue Technology in Video Advertisements. *Journal of Press Frontiers*, 2024(24): 31–33.
- [2] Xuan X, 2025, From Technological Innovation to Emotional Resonance: A Study on the Impact of AI-Generated Short Video Advertisements on Consumer Participation Willingness, thesis, Shanghai International Studies University.
- [3] Zhang M, 2025, AI-Generated Videos in New Media Communication: Principles, Applications, and Challenges. *Omnimedia Exploration*, 2025(3): 121–124.
- [4] Qin Y, Li Y, Tang R, et al., 2025, The Dilemma and Solutions of the Commercial Application of Text-to-Video Technology. *Hi-Tech & Industrialization*, 31(3): 51–53.
- [5] Wang M, 2025, AI Empowers Video Editing. *Creative World*, 2025(12): 78–81.
- [6] Wu Z, 2024, The Application of Generative AI in Video Creation Abroad. *TV Research*, 2024(5): 26–29.
- [7] Sun H, Sun L, 2024, Research on the Innovative Application of AI Technology in Film and Television Short Film Production. *Zhangjiang Technology Review*, 2024(4): 15–17.
- [8] Deng Y, 2025, Trend Analysis of E-commerce Advertisement Design under AIGC Technology. *Footwear Technology & Design*, 5(4): 129–131.
- [9] Xu X, 2025, Innovative Application of AI Technology in the Television Industry in the Intelligent Media Era. *Communication Power Research*, 9(10): 13–15.
- [10] Tong X, 2024, A Brief Analysis of Dynamic Storyboard Editing Techniques for E-commerce Video Advertisements. *Journal of Jiaozuo University*, 38(1): 29–32.

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