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Analysis of the Homogeneity of Algorithm Recommendation-driven Content Creation on Short Video Platforms

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Abstract: Unlike traditional social platforms, short video platforms analyze users' interest preferences, viewing behavior, and interaction records in real time through big data and artificial intelligence algorithms, providing personalized content recommendations. While this customization improves user experience and platform engagement, it has also led to a certain degree of content convergence. This study explores how algorithms drive content style convergence on short video platforms and influence users' creative intentions and aesthetic preferences. The research highlights that while recommendation algorithms enhance user experience, they also contribute to the homogenization of content creation. Moreover, platform design and communication mechanisms play a crucial role in shaping public perceptions of aesthetics, entertainment, and social values. By analyzing platform algorithms and their underlying mechanisms, this research offers a theoretical foundation for improving short video platform design and reflects on the ethical responsibilities these platforms bear in shaping digital culture. However, the study has certain limitations, including the reliance on qualitative and platform-based analysis without extensive empirical user data or creator interviews. Future research could benefit from a mixed-methods approach that includes quantitative user engagement data and qualitative interviews with content creators and platform engineers.

Keywords: Algorithmic recommendation systems, short video platforms, content convergence, algorithmic aesthetics

1. Introduction

In recent years, short video platforms such as Douyin and Xiaohongshu have risen rapidly and become essential to global social media. These platforms rely on an innovative algorithmic recommendation mechanism to push content to users, dramatically changing people's content consumption methods and creation modes [1]. Unlike traditional social platforms, short video platforms are able to analyze users' interest preferences, viewing behavior and interaction records in real-time through big data and artificial intelligence algorithms, and then provide personalized content recommendations for each user. Although this customized recommendation has improved the user experience and platform activity, it has also led to a certain degree to the phenomenon of convergence in content creation and dissemination, that is, different platforms are gradually converging on the technical logic, content style and visual presentation.

Behind this phenomenon are two important concepts of "platform convergence" and "algorithmic aesthetics". Platform convergence refers to the gradual convergence of different short video platforms

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in terms of functional design, content presentation and user interaction, especially under the guidance of the recommendation mechanism [2]. The content presentation mode of the platforms has become more and more similar. Meanwhile, algorithmic aesthetics emphasizes the role of algorithms in shaping content creation and presentation. The platform's recommendation algorithm not only decides which content can be seen by more people but also influences the creators' creation style, presentation method and aesthetic tendency. This paper examines how algorithms drive the convergence of content styles on short video platforms, influencing users' creative intentions and aesthetic preferences. A key question is whether recommendation algorithms, while enhancing user experience, unintentionally contribute to the homogenization of content production. The study also investigates how platform design and communication mechanisms shape public perceptions of aesthetics, entertainment, and social values. By analyzing platform algorithms and their underlying mechanisms, this research aims to offer a theoretical foundation for improving short video platform design and to reflect on the ethical responsibilities these platforms bear in shaping digital culture.

2. The evolution of algorithmic recommendation on short video platforms

2.1. A historical overview of recommendation system development

The algorithmic recommendation system of short video platforms has experienced an evolution from early collaborative filtering to modern deep learning, showing how technological progress has profoundly changed the way of content distribution. In the beginning, collaborative filtering algorithms became the basis of content recommendation. Collaborative filtering relied on historical user behavioral data (e.g., viewing history, likes and comments) to make recommendations. The core of this approach is to recommend content to users that they are likely to appreciate by analyzing the similarities between them and other users [3]. The advantage of this algorithm is that it is simple and effective, and can make accurate recommendations based on user preferences, but its disadvantage is that it is difficult to understand the characteristics of the content itself deeply. With the development of machine learning technology, deep learning algorithms have gradually become the core of the recommendation system of short video platforms. Deep learning can not only process a large amount of user data, but also analyze video content's visual, audio and linguistic information. Through technologies such as convolutional neural networks (CNN) and recurrent neural networks (RNN), the platform can deeply understand the semantics and emotions of the video, thus improving the accuracy of content recommendation [4]. Compared with traditional collaborative filtering, deep learning can make predictions based on the user's potential interests, not only based on the user's historical behavior, but also capable of labeling, classifying, and emotionally analyzing the video content, thus realizing a more refined personalized recommendation. Also, short video platforms have increasingly integrated reinforcement learning technologies to enhance recommendation strategies through continuous real-time feedback. Reinforcement learning algorithms modify their decision-making processes by analyzing users' responses to recommended content, such as viewing duration and interaction frequency. This feedback-driven mechanism allows platforms to adapt efficiently within complex and dynamic environments, thereby offering content that more precisely aligns with users' preferences. The evolution of algorithmic recommendation systems on these platforms—from early collaborative filtering techniques to the implementation of deep learning and reinforcement learning—has significantly improved the precision and intelligence of content delivery. This technological progression has had a profound impact on the overall content ecosystem of short video platforms.

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2.2. Content distribution mechanism of the short video platform

The content distribution mechanism of the short video platform is the core of the platform ecology, which directly affects the dissemination speed and scope of the content. The primary function of the content distribution mechanism is to push suitable content to users according to their interests and needs [5]. Unlike the traditional media model that relies on a fixed broadcast schedule, short video platforms have redefined content distribution through personalized recommendation systems, enabling flexible and on-demand access to content. These platforms primarily utilize users' historical behavioral data to construct content recommendation models. Through actions such as viewing, liking, commenting, and sharing, users generate large volumes of data that allow the system to analyze individual preferences and patterns of interest. This behavioral data encompasses not only metrics such as viewing duration and interaction frequency, but also contextual information including geographic location and device type. By processing these data points, the recommendation algorithm is able to identify content that aligns more closely with user interests and deliver it accordingly.

In addition to user behavior, content-specific features are also integrated into the recommendation process. Platforms analyze elements such as video tags, titles, thumbnails, background music, and subtitles in order to categorize and prioritize content effectively. For videos that exhibit high levels of engagement, the system may further increase their exposure through algorithmic amplification, thereby reaching a wider audience.

2.3. The influence of recommendation algorithms on popular aesthetics, content pacing, and creative practices

The recommendation algorithm of short video platforms not only influences the viewing behavior of users, but also profoundly shapes creative elements such as popular styles, content rhythms and composition habits on the platform [2]. Behind these influences is the guidance of the platform's recommendation logic on the behavior of content creators. Recommendation algorithms usually select highly interactive and high-traffic videos when pushing content, which makes short-video creators pay more attention to catering to the preferences of platform algorithms when creating videos. For example, many video creators choose to use popular filters, background music or soundtracks, and adopt fast editing techniques to attract users' attention. Fast-paced editing and rapidly changing images have become standard features of many short videos, and the popularity of this style is closely related to platforms' recommendation algorithms. As platforms prefer to push videos with frequent user interaction, creators often produce content more visually appealing and attractively, reinforcing the creative motivation of "catching users' eyeballs".

Platform algorithms greatly shape the rhythm, style, and structure of short videos, especially on Douyin. To match users' fragmented viewing habits, content is often limited to 15 seconds to 1 minute, featuring quick cuts and rhythmic editing. This encourages creators to use concise storytelling and striking visuals—such as symmetry, bold colors, and clear focal points—to meet algorithmic preferences. The system favors highly engaging content, boosting videos with more likes, comments, and shares. As a result, creators tend to follow popular formats, which gradually leads to stylistic and narrative uniformity across the platform. Over time, this leads to a degree of visual and narrative homogenization across the platform. While recommendation algorithms enhance user experience by efficiently matching content to user preferences, they also influence the platform's dominant style and contribute to the convergence of creative expression, raising important questions about the diversity and freedom of content creation in algorithm-driven environments.

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3. Challenges in content diversity and algorithmic bias on short video platforms

There are notable differences between Chinese and foreign short video platforms in content recommendation, user behavior, and platform culture. TikTok focuses on entertainment and trends, using algorithms to promote light, engaging content like humor and dance, appealing to a young global audience [1][6]. In contrast, Douyin offers more diverse content, including lifestyle, education, and marketing, tailored to Chinese user habits and emphasizing social interaction [1]. Similarly, Xiaohongshu emphasizes community influence and long-term content engagement, while Instagram relies on personal social circles and favors visually impactful, short-lived content [7]. The differences in recommendation algorithms between platforms like Douyin and TikTok highlight the influence of cultural and behavioral factors on content dissemination. These platforms' varied approaches reflect the importance of adapting algorithms to suit local markets. However, despite their success, short video platforms face several challenges related to content homogenization, algorithmic biases, and the potential for overemphasis on entertainment at the cost of diversity. AI-generated content, an important technological innovation on these platforms, is both a solution and a problem. While it helps creators save time and tailor content based on data analysis, it often leads to formulaic and repetitive outputs, which limits creativity and individuality. Moreover, the platform's recommendation mechanisms tend to favor viral content, which further exacerbates these challenges. The following section will analyze the key issues that arise from these challenges.

4. Issues of content styling and value direction in short video platforms

4.1. Content homogenization issues

The recommendation algorithm of the short video platform relies on user behavior data to push content. Although this mechanism can improve the user's personalized experience, it also invisibly aggravates the homogenization of content [8]. As mentioned above, in order to cater to the preferences of the algorithm, creators are increasingly inclined to produce content that meets the platform standards, and this content often follows certain templated rules. For example, the two short video screenshots shown in Figure 1, although they are two creators, they use similar layouts and styles, which intuitively demonstrates the uniformity of the content [9]. Homogeneous content not only weakens the creative diversity of short video platforms, but may also reduce the long-term activity and stickiness of platform users. When users receive a large amount of similar content, they are likely to feel bored, and then reduce the frequency of using the platform, resulting in the uniformity and closedness of the platform culture.

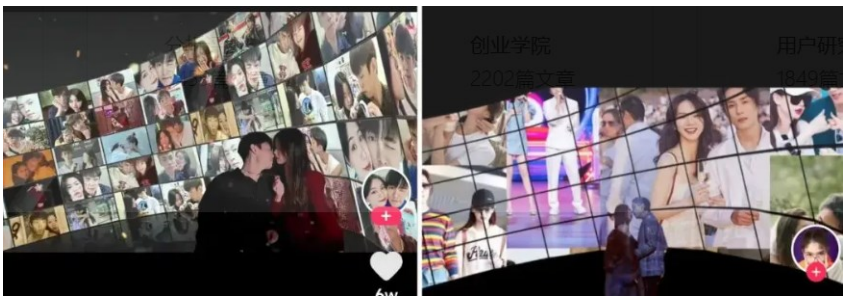

Figure 1: Similar content between two TikTok creators [8]

4.2. The rise of the formation of style templates

With the optimization of algorithmic recommendation systems on short video platforms, creators have gradually adopted a "copycat culture" in response to platform demands. The platform's reward

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mechanisms often favor videos with high interactivity and wide reach. To gain more visibility and traffic, creators have started to replicate successful content, using similar filming techniques, background music, and even comparable performance styles. This trend of imitation has spread throughout the platform ecosystem, creating a distinctive "style template." For instance, dance challenges on the Street Sound platform have become one of the dominant forms of content creation. By replicating popular dance moves and music, creators can quickly secure platform recommendations and capture user attention. Platforms incentivize creators through interactive features like likes, comments, and shares, while users also imitate trending videos to increase their exposure. As creators continue to chase traffic and attention, many opt for imitation over innovation, copying videos that have already received substantial recommendations. While this imitation culture may boost the platform's content engagement in the short term, it stifles creativity and individuality, ultimately diminishing the platform's freshness and creative diversity.

4.3. The social risks of unfiltered algorithmic promotion

The content creation and recommendation mechanism of short video platforms not only influences the formation of platform culture, but also promotes the spread of specific negative values to a certain extent [10]. Since the platform's recommendation algorithm mainly relies on traffic and interaction to determine the visibility of the content, creators and platforms increasingly pursue eye-catching "curiosity content" [10]. In order to get more clicks and shares, some creators tend to produce vulgar, exaggerated, or even false content to cater to the low-level interests of viewers, leading to aesthetic fatigue and distortion of values. In order to quickly attract viewers' attention, some short video creators tend to use exaggerated presentation methods, such as excessive emotional rendering and false displays and even include misleading information in their content. The platform's recommendation mechanism does not effectively differentiate between high-quality content and low-quality content, making it easy for these vulgar and fake videos to gain more exposure. Although these contents may bring short-term traffic, in the long run, they significantly affect the values of users, especially the aesthetics and cognition of young viewers. Short video platforms' emphasis on maximizing traffic often fuels the spread of consumerist values. To capture user attention, these platforms frequently promote content that highlights luxury lifestyles, material wealth, and consumption. This kind of content subtly fosters distorted value perceptions, encouraging a superficial and utilitarian pursuit of material goods. For younger audiences in particular, such cultural messaging can skew their understanding of a fulfilling life and may lead to the imitation of unrealistic, idealized lifestyles.

5. Discussion

The recommendation algorithm on short video platforms significantly influences content orientation, but its focus on traffic-driven logic has led to content convergence and stifled creativity. To address this, the platform should enhance its algorithm by introducing a trust-based recommendation system that incorporates factors like culture, interests, and region. This can reduce content homogeneity and encourage diverse creative styles. An incentive mechanism should also be implemented to motivate creators to produce innovative, artistic, and socially valuable content. Additionally, the platform should prioritize users' long-term interests, avoid the "information cocoon" effect, and foster content diversity and creative freedom. Additionally, the rise of AI-generated media, especially those that use models such as StyleGAN for content creation and style transfer, may further strengthen the trend of homogeneity. Although these technologies expand the possibilities of visual production, there is also a risk of exacerbating aesthetic convergence because the generated content often conforms to the

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mainstream algorithmic model. Future research will continue to explore how StyleGAN and similar tools shape media forms, challenge creative norms, and influence platform-based visual culture.

Besides, the government should enhance oversight of platform algorithms to address short-term loopholes and ensure transparency in content recommendations, preventing excessive influence on user choices. Regulatory bodies should encourage platforms to disclose their algorithmic frameworks and decision-making processes, enabling users to make informed and responsible decisions. Content supervision should prioritize value-based guidance to prevent the spread of vulgar, misleading, or false content, particularly among young audiences. Stricter penalties should be imposed on creators who publish illegal or distorted content.

6. Conclusion

In conclusion, this study examined how algorithmic recommendation systems on short video platforms like Douyin and Xiaohongshu affect content creation, visual styles, and user engagement. By looking into how these platforms operate and how users respond, the research shows that algorithms play a key role in shaping the content environment. While personalized recommendations improve user experience and content delivery, they also raise concerns. These include algorithmic bias, cultural uniformity, and limited space for creative expression. The dominance of certain styles and formats can push aside unique or alternative content. Additionally, the rise of AI-generated videos, although convenient, tends to repeat popular patterns and may further limit creative diversity across platforms. Despite these insights, this research is not without limitations. First, it primarily relies on qualitative and platform-based analysis, without incorporating extensive empirical user data or creator interviews. This restricts the depth of understanding regarding user perception and individual creative strategies. Future research could benefit from a mixed-methods approach that includes quantitative data, such as user engagement statistics, and qualitative interviews with content creators and platform engineers.

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