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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 media platforms, short video platforms use big data and artificial intelligence algorithms to look at users' interest preferences, viewing behavior, and interaction information in real time, providing personalized content recommendations. While this tailored approach improves user experience and platform stickiness, it has also caused a certain amount of content to become similar. This study explores how algorithms make content styles converge on short video platforms and influence users' creative intentions and aesthetic preferences. The research shows that while recommendation algorithms make user experience better, they also lead to the homogenization of content creation. Moreover, platform design and communication mechanisms play an important role in shaping public views on aesthetics, entertainment, and social values. By looking at platform algorithms and how they work underneath, this research provides a theoretical basis for improving short video platform design and thinks about the ethical responsibilities these platforms have in shaping digital culture. However, the study has some limitations, including relying on qualitative information and platform-based analysis without much real user data or creator interviews. Future research could use a mixed-methods approach that includes quantitative user engagement information and qualitative interviews with content creators and platform engineers, to put it simply.

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]. The deep learning compared to the conventional collaborative filtering can provide predictions either through the potential interests of the user, and not just through the previous history behavior of the user, but has the ability to label, classify and provide emotional analysis on the video content hence achieving a more sophisticated recommendation tailored to the individual user. Moreover, the platforms of short videos have actively incorporated reinforcement learning technologies in order to improve the strategies of recommendations using continuous real-time feedback. Reinforcement learning algorithms seek to adjust their decision-making procedures through examining response of users to information suggested to them, including length of viewing and interaction frequency. The result is an efficient response to changing complex environments by platforms, in this feedback-driven mechanism that provides content that better matches the preferences of users.

2.2. Content distribution mechanism of the short video platform

The most important part of the platform ecology is the content distribution mechanism of the short video platform, and it directly impacts the speed and reach of the content. The main action of the content distribution system is to promote proper content to buyers based on their needs and interests [5]. In contrast to the older media formula that could use a fixed model of broadcasting, short video

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platforms have reconstructed the content distribution model using personalized recommendation algorithms, thus allowing flexible and on-demand access to content. These platforms largely rely on historical behavioural data of users and use them to create content recommendation models. Immediate behaviour like seeing, liking, commenting and even sharing allow users to create massive data which the system can use to interpret the likes and preferences of each and every user and their preferences regarding what to like and what not to like. This is behavioral data, and it includes not only indicators of viewing time and frequency of interaction, but also contextual data, such as the geographic position and the type of device used. Through the analysis of such data points, the algorithm of recommendations can determine what content is more comparable to the interests of the user and deliver it to them.

Besides the behavior of the user, there are also some content-specific features added to the process of recommendation. Elements analyzed by platforms include video tags, video titles, video thumbnails, background music and video subtitles with the aim of categorizing and prioritizing the content. In the case of videos with high engagement degrees, the system can also amplify them using algorithms and, therefore, target a broader 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 are very influential in the rhythm, style and organization of short videos, particularly on Douyin. Content can be anywhere between 15 seconds and 1 minute to keep up with the disjointed viewing behaviour of users, with fast cuts and rhythmic editing. This makes creators cut down on length to tell the story, and embrace aggressive graphics including symmetry, vivid colors, and defined focus areas in order to match the algorithmic tastes. The system does prefer the type of content, more likes, comments and shares, like it to prefer highly engaging content in terms of increased likes, comments, and shares. This phenomenon makes the creators adhere to the most popular formats, and over time, this will result in the appearance of stylistic and narrative homogeneity throughout the platform. This causes, via time, a homogenization of the image and narrative on the platform. Recommendation algorithms not only contribute to the experience of users by effectively combining content and user tastes but they also set the popular fashion of the platform, the phenomenon of bringing about convergences in creative expression, being an important concern about diversity and freedom in the creation of content in an algorithm-based environment.

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,

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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.

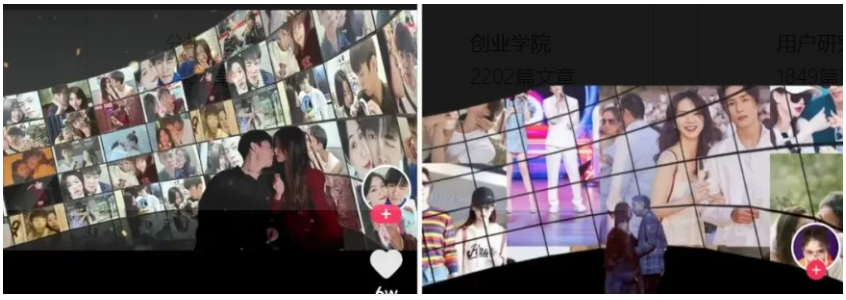

Figure 1. Similar content between two TikTok creators [8]

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 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

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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 mechanisms of short video platforms not only affect the formation of platform culture, but also contribute to the spread of certain negative values to a certain extent [10]. Since the platform's recommendation algorithm mainly relies on traffic and interaction to determine the visibility of content, creators and platforms are increasingly pursuing eye-catching "novel content" [10]. In order to obtain more clicks and shares, some creators tend to produce vulgar, exaggerated or even false content to cater to the low-level interests of the audience, leading to aesthetic fatigue and value distortion. The platform's recommendation mechanism cannot effectively distinguish between high-quality content and low-quality content, making it easier for these vulgar and false videos to gain exposure. Although these contents may bring short-term traffic, in the long run, they will have a significant impact on users' values, especially on the aesthetics and cognition of young viewers. The pursuit of maximizing traffic by short video platforms often contributes to the spread of consumerist values. In order to attract users' attention, these platforms often promote content that showcases luxurious lifestyles, material wealth and consumption. Such content subtly distorts people's values and encourages people to superficially and utilitarianly pursue material enjoyment.

5. Discussion

Short video platforms recommend algorithm plays a greater role in shaping content orientation, however, because of its emphasis on logic based on traffic, a content convergence effect and stifled creativity have ensued. To solve this, the platform ought to expand its algorithm to have an element of trust based recommendation system that factors in aspects such as culture, interests and region. This will have the capacity to decrease content homogeneity and promote various creative styles. There should also be an incentive system in place so that creators will be inspired to create innovative, artistic and socially redeeming content. The platform must also be focused on the long-term interests of the users, not the phenomenon of the information cocoon, and encourage diversity in content and freedom of creativity. Moreover, the emergence of AI-generated media, particularly the ones that rely on when it comes to creating content and offering it in the format of style transfer, e.g., StyleGAN, can continue to propel the homogeneity movement forward. As much as these technologies increase the potentials of the visual production, there is a risk of creating more aesthetic convergence as well since the created content tends to follow the mainstream algorithmic model. The role of StyleGAN and other similar tools in defining the media forms, disrupting creative standards, and affecting the visual culture on the platform will be dealt with in future studies.

6. Conclusion

To sum up, this paper has explored the influence of recommendation systems driven by algorithms on short video apparel such as Douyin and Xiaohongshu on the creation of content, visual culture, and smart interactions between users. Through the analysis of how these platforms are organized and how people are reacting to them, the study reveals that the algorithm is a major determinant of content

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environment creation. Although personalized recommendations enhance user experience and product delivery, they are a source of concerns too. These are bias in algorithms, cultural homogeneousity and insufficient room to express creativity. This control over particular content by high-ranking styles and formats may displace unique or alternative content. Also, the development of AI-generated videos, despite its convenience, is more likely to repeat some trendy trends and potentially further narrow the range of creativity on platforms. Regardless of these observations, this study does not lack restrictions. To begin with, it is based mostly on qualitative and platform analysis, and it does not involve the vast amounts of empirical user data or interviews with creators. This limits the level of insight into user perception, as well as, personal creative strategies. Subsequent studies might offer a better mixed approach to this by utilizing both qualitative (interviews with content creators and platform engineers) and quantitative (user engagement data) data.

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