

Research on Innovation and Application of Integrated Media Content Generation Based on Artificial Intelligence

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Abstract: As an emerging form of media, integrated media not only enriches the expression and dissemination of information, but integrates various forms, both online and offline, to enable resource flow and cross-platform communication. With the development and application of information technology and 5G technology, the information needs of the broad audience have undergone a shift from a single media format to more diversified and personalized integrated media content. The rapid development of Artificial Intelligence (AI) technology has provided strong support for the generation and innovation of integrated media content. Through automation, multimodal content generation, immersive experience, and other ways, the application of Artificial Intelligence technology can not only improve the efficiency of content creation and enrich creative expression forms, but also provide users with more diversified and personalized information.

Keywords: Integrated media content; Artificial Intelligence technology; Dissemination of information

Online publication: February 14, 2025

1. Introduction

At present, with the rapid development of computer technology and scientific advancements, Artificial Intelligence (AI) technology has made significant breakthroughs in the fields of academia, media, and technology, gradually becoming the driving force behind the new wave of socio-economic development. By its inherent advantages, AI technology has driven industry innovation, technological breakthroughs, and information dissemination, and has been widely applied in various fields of society. In the new era, traditional forms of media creation and communication are facing unprecedented challenges. As the product of the convergence of various media types, integrated media effectively presents information through diversified expressions, which is consistent with people's needs for information in the context of the new era. Therefore, AI technology brings more possibilities and development space for the innovation and application of integrated media content.

2. The advantages of AI technology in the generation of integrated media content

2.1. The improvement of content generation efficiency

The rapid development of AI technology has driven openness and innovation of content creation in the media era. Through the application of AI technology, the integrated media industry can improve the speed and efficiency of content creation, reduce cumbersome workflows, and promote the positive development^[1] of content generation and dissemination under the support of massive resources. At the same time, with the application of AI technology, integrated media can not only handle many labor-intensive tasks, such as content editing, proofreading, and formatting adjustments but also enable automated content generation and reduce the consumption of manual operation processes and related energy. AI-driven content creation and data organization ensure the effective utilization of massive resources, further reducing resource and energy waste.

2.2. The enhancement of user interaction experience

Through intelligent algorithms and machine learning technology, AI technology can integrate multiple types of data and resources, such as text, images, and audio, to create more diverse and vivid media content and enhance users' immersive experiences. In the process of analyzing input textual data, AI assistants and language processing technology enable the system to automatically process and generate the required content, and adapt to different expressions and user needs^[2]. Image recognition technology and intelligent algorithms can extract the required content, images, and audio from vast resource databases and integrate them with creative content, thereby enhancing the visual expression of the content and improving the user experience. Furthermore, with the application of AI technology, the input text can also be transformed into natural, smooth, and logical speech, which makes the creation of content more diversified, to enhance the practicability of content and user interactivity^[3]. By searching and integrating various data, AI technology not only improves the efficiency of integrated media content generation but also provides users with customized content through autonomous operation, driving convergent media content toward more innovative and personalized directions.

2.3. The creativity and diversity of content creation

With its superior computational power, recognition abilities, and monitoring capabilities, AI technology can analyze and monitor^[4] behavioral data of users from multiple perspectives and all-around aspects. By monitoring and analyzing users' information needs and behavioral data, AI systems are capable of identifying automatically users' preferences and related content, thereby promoting the optimization and filtering of content. Using machine learning algorithms and data analysis tools, AI technology extracts keywords for content creation from various data of users, including indicators such as search interests, viewing time, and comment forms. The application of this technology allows creators to adapt the direction and quality of content generation in real-time according to changes of the times and users' information needs, facilitating the innovative development of integrated media. Furthermore, it is AI technology that can automatically adjust the generation patterns, themes, and editing^[5] of the content based on the audience's acceptance and click-through rates. By analyzing the characteristics of the era and popular trends, AI technology can quickly capture potential patterns in data or emerging viewpoints, enabling it to be integrated and published to some extent, and identify innovative opportunities at the forefront of technology, driving intelligent development and fostering new business breakthroughs.

3. The challenges faced by AI technology in the generation of integrated media content

3.1. Technical challenges

Currently, although AI technology is extensively applied across various fields, ensuring consistently high standards and quality of results remains challenging ^[6]. There are still some difficulties in dealing with more complex and high-quality content, especially in the field of integrated media content generation. For example, It is difficult to understand and generate texts with deep connotations in processing and analyzing text for AI technology, due to the unique expressive techniques and logic of language. Moreover, while AI technology can preprocess image data through deep learning algorithms, it is still difficult to generate high-quality images or visuals due to the influence of image format, size, audio, and other factors, which harms the application range of AI technology in integrated media content creation.

3.2. The bottleneck of creation

Although AI technology is widely applied in the media industry, the content it generates is largely based on existing data and materials from databases, often lacking innovation, which results in high repetition rates. Additionally, the content generated by AI technology lacks a certain level of depth. Specifically, while AI technology can extract and combine qualified data, it lacks human creativity and emotional expression, making it difficult to simulate human activities or thoughts in the form of programs, resulting in the lack of a certain depth of the final content. Furthermore, the content generated by AI technology may contain errors or biases due to biases in the database content, which may lead to transmission accidents of information ^[7].

3.3. Ethical and social responsibility issues

As Artificial Intelligence technology expands within the integrated media sector, ethical dilemmas and social responsibility concerns have become increasingly prominent. On the one hand, AI-generated content is highly likely to involve issues related to copyright and privacy. For example, it is difficult for AI technology to distinguish between copyright and non-copyright content, making it prone to copyright disputes when extracting content. Additionally, extracting others' privacy or related data without their consent may lead to legal disputes ^[8]. On the other hand, AI technology can't filter information, making it prone to generating misleading content, such as unethical material or content that could destabilize society, potentially triggering major information incidents. Moreover, the widespread use of AI technology has greatly reduced labor and resource costs, causing major changes in the job market and increasing employment competition.

4. The innovation in AI-driven content creation for integrated media

4.1. Promoting the creation of multimodal content and innovation in presentation forms and enhancing communication effectiveness

- (1) Application of Natural Language Processing (NLP) technology: As an important application technology of AI, Natural Language Processing (NLP) technology plays an essential role in content generation and creation, which has brought great changes to the creation of integrated media content. Firstly, sentiment analysis, a technique within NLP technology, can deeply identify and analyze attitudes and emotional tendencies in data during content creation, providing users with more authentic feedback of the public. This allows users to refine and customize content more effectively, enabling them to address the diverse

and evolving needs of their audience with greater precision and relevance. Secondly, NLP technology can also organize and analyze extracted texts or images, helping creators quickly filter valuable content to enhance its depth and professionalism. Finally, virtual robots have emerged as vital tools in media content creation, facilitating real-time interaction with users and enabling the timely collection of user feedback, which helps in delivering content that effectively meets user demands.

- (2) The technology of text generation based on deep learning: In the creation of integrated media content, deep learning technology plays a crucial role in text summarization, text translation, and text generation, which significantly enriches the means and methods of integrated media creation ^[9]. Deep learning technology is capable of autonomously extracting the core content from data or text, generating concise and coherent summaries, and enabling users to rapidly access and comprehend key information. Additionally, it can process massive amounts of data and break language barriers, allowing readers worldwide to access and comprehend published content.
- (3) The vivid generation and optimization of video content: The system of automatic video content generation usually consists of multiple modules, including text-to-speech, text-to-graphics, image-to-video conversions, and so on. Under the guidance of instructions, the automatic video generation technology can prioritize and select character images, text backgrounds, action scenes, and expressions based on textual information, ultimately producing high-quality short video content.

4.2. Strengthening the creation and innovation of integrated media content and providing personalized intelligent services

With the rapid advancement of AI technology, the creation of integrated media content has gradually undergone a significant transformation, evolving from single-modal to multi-modal in content generation, which not only enables basic content generation but contributes to the creation of innovative and creative content. For example, AI technology can automatically generate images, design proposals, and short video scripts, greatly expanding the boundaries of content creation and providing new inspiration and tools for content creators. The introduction of multimodal models for AI technology enhances the capability to process and manage complex content, allowing media professionals to automatically generate summaries based on the use of visual data and multimedia tools, generating more enriched and scientifically-backed content, providing readers with immersive video experiences ^[10].

Speech synthesis technology, another crucial technology driving the advancement and innovation of integrated media creation, is capable of converting text automatically into natural, fluent speech, enabling machines to perform speech broadcasting like humans. Firstly, the multimedia system can automatically generate news broadcast audio by applying speech synthesis technology, allowing media professionals to easily download and utilize the content. The application of automatic speech synthesis technology not only enhances the efficiency of news production but also generates diverse news broadcasts to meet the varied needs of the audience.

Secondly, speech synthesis technology can support broadcasts in multiple languages, offering the potential for international integrated media organizations with greater long-term development ^[11]. Through speech synthesis technology, integrated media agencies can quickly expand overseas markets and provide personalized news broadcast services to users worldwide.

Finally, speech synthesis technology can customize personalized news broadcasts, thereby enhancing user engagement and frequency of interaction, which ultimately contributes to an improved user experience.

4.3. Optimizing distribution paths of content, achieving intelligent communication, and content delivery

- (1) User profile-based content recommendation algorithms: By utilizing user profiles, AI-driven content recommendation algorithms technology can more accurately analyze users' needs and preferences, thereby offering more targeted and relevant content. For instance, media platforms can recommend relevant news or articles based on their reading habits and saved content preferences ^[12]. Video platforms can recommend video content of interest based on their viewing history and time spent watching. Users no longer need to invest significant time in searching for content of interest. Instead, they can directly access content that has been carefully curated for them by the recommendation system.
- (2) Keyframe-based video editing technology: Keyframe is a fundamental tool in both video editing and content analysis. Keyframe-based video editing technology can automatically extract the keyframes in the video and improve the editing speed and quality of the video based on the association and transition effects of content ^[13]. Traditional video editing requires users to manually select frames for editing, however, with the application of AI technology, this process can be fully automated, allowing for the swift extraction and editing of keyframes, greatly improving the editing efficiency.
- (3) Sentiment analysis-based video editing technology: As an important technology in the field of Artificial Intelligence, sentiment analysis is typically used to filter and analyze the key content and emotional trends in text, speech, or images ^[14]. In the work of video editing, AI-driven sentiment analysis technology can automatically detect the emotional trend in the video, and adjust the proportion of the frames, the integrity of the storyline, and the state of the characters according to the content and plot changes. Additionally, sentiment analysis-based video editing technology plays an important role in the creation and production of video advertisements. Through the collection and analysis of data, AI technology can more accurately grasp the needs of audiences, provide data support for advertising production and delivery, and improve the communication efficiency of advertisement distribution.

4.4. Strengthening innovative interaction and communication models of media integration and enhancing the sense of user participation

Firstly, 3D modeling technology, under the framework of AI technology, has been widely applied in integrated media, with virtual host designs being particularly popular among media professionals. Through 3D modeling technology, media workers can create vivid and realistic virtual hosts, including facial details, expressions, height, and other aspects. Additionally, the design of virtual hosts can be altered according to the scene or the theme, allowing for effective integration into work settings and creating more realistic and engaging media content, thereby enhancing the users' sense of participation and immersion.

Secondly, in the creation of integrated media content, images, and illustrations are essential parts of the article, serving as key factors in improving the efficiency of information dissemination and enhancing users' interaction. In the traditional work of content creation, images and illustrations need to be manually searched and analyzed. However, with the support of AI technology, news systems can autonomously generate images and illustrations based on the textual content, and publishers can also use AI to automatically insert relevant illustrations ^[15]. With the assistance of AI, animation companies can reduce the investment of manpower, improve the efficiency and quality of creation, and promote the customization and personalization of media content.

Lastly, AI technology can expand the forms and scope of integrated media content expression. By utilizing

new algorithms, AI technology is capable of adding creative effects to the original text based on hot topics or trends, making it more engaging and captivating. For example, AI can automatically generate visual animations that match the scene content, and it can also create music works that perfectly blend with the video content. This greatly improves the innovation of the content, which is conducive to enhancing the users' sense of experience and participation.

5. Conclusion

In conclusion, within the realm of Artificial Intelligence, the ongoing advancements in information technology and the development of intelligent systems have led to increasingly diversified user information demands. This has rendered the innovation of integrated media content an urgent priority for the contemporary media industry. Artificial Intelligence not only broadens the scope of expression for integrated media content, enhancing its innovation and diversity, but also significantly improves user experience. To achieve this, promoting the innovation of multi-modal content creation and presentation methods, reinforcing the creation and innovation of integrated media content, optimizing content dissemination pathways, and enhancing the innovative interaction and dissemination models of integrated media can maximally promote the innovation and application of integrated media content, thereby optimizing content creation and dissemination.

Disclosure statement

The author declares no conflict of interest.

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