Postprint: AI Technology Applications in Broadcasting and Hosting in the Converged Media Era

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Abstract

Given that the application of artificial intelligence technology plays a crucial role in innovating and reforming traditional broadcasting and hosting work methodologies, this paper proposes a research study on the application of AI technology in broadcasting and hosting within the converged media era. Under the converged media paradigm, the application of AI technology in broadcasting and hosting exhibits several advantages, including standardized information broadcasting, novel expression formats, strong learning capabilities, and reduced labor costs. The methodology involves utilizing AI technology to collect, process, and analyze voice data signals, employing speech synthesis technology to simulate human voice for completing broadcast voice tasks; implementing a series of processes including voice data collection, data processing, data analysis, topic extraction, and template matching to achieve automated generation of broadcast content; and leveraging AI interaction technology to develop virtual hosts equipped with communication and dialogue functions to fulfill knowledge-based Q&A tasks in broadcasting and hosting, thereby completing the research on the application of AI technology in broadcasting and hosting within the converged media era.

Full Text

Application of Artificial Intelligence Technology in Broadcasting and Hosting Work in the Era of Media Convergence

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Abstract: The application of artificial intelligence technology plays a crucial role in innovating and reforming traditional broadcasting and hosting work methods. This study investigates the application of AI technology in broadcasting and hosting within the media convergence era. AI applications in this field

offer several advantages: standardized information delivery, novel expression forms, strong learning capabilities, and reduced labor costs. The technology collects, processes, and analyzes voice data signals, simulating human speech through speech synthesis to complete broadcasting tasks. Through processes including voice data collection, processing, analysis, theme extraction, and template matching, automated content generation for broadcasting is achieved. Furthermore, AI interaction technology enables the development of virtual hosts with communication and dialogue capabilities to fulfill knowledge-based Q&A tasks in broadcasting and hosting. This research completes the investigation of AI technology applications in broadcasting and hosting within the media convergence era.

Keywords: media convergence; artificial intelligence; broadcasting and hosting; virtual host; knowledge Q&A; speech synthesis; AI

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Introduction

Artificial Intelligence Technology (AI), also known as machine intelligence or smart machinery technology, refers to the presentation of human intelligence through computer programs. John McCarthy defined AI in a 1964 publication as technology that can learn from its environment and take actions to achieve goals. As an important branch of computer science, AI can simulate human thinking processes and behaviors, and has gained increasing attention and become a popular research topic due to its precise decision-making and strong learning capabilities. Currently, AI technology has been widely applied in numerous fields, including robotics, intelligent decision-making, simulation, control systems, and recognition systems.

In the context of media convergence, AI technology is gradually being integrated into broadcasting and hosting work. Incorporating AI into traditional broadcasting methods can accelerate industry transformation and enhance the intelligence, informatization, and datafication of broadcasting and hosting operations. In the media convergence era, broadcasting and hosting work must be redefined, using AI to replace the traditional process of converting written text to oral expression, making the work more innovative while reducing human resource costs. Although AI application in news media communication is relatively recent and academic research on this new broadcasting technology remains

limited, its potential is significant. When broadcasters review their scripts for the day, they must deliver them accurately and fluently, but errors, misreports, and pronunciation issues are inevitable. In the media convergence era, AI technology can process information precisely and generate voice to achieve accurate script delivery.

1. Application Advantages of AI Technology in Broadcasting and Hosting in the Media Convergence Era

1.1 Standardized Information Broadcasting

From a communication studies perspective, broadcasting and hosting is information dissemination through media. Traditional broadcasters may encounter accidents, misreports, or pronunciation inaccuracies when delivering scripts. AI technology can process information with high precision, with volume, speed, and timbre predetermined in computer programs. AI-synthesized speech is based on voice technology prototypes or samples, featuring standardized vocabulary and grammar, clear articulation, and fluent expression. Therefore, AI application in broadcasting and hosting offers the advantage of standardized information delivery.

1.2 Novel Expression Forms

AI-developed virtual characters have been widely applied in broadcasting and hosting. These virtual figures possess all hosting functions of real people, including facial expressions, eye contact, and movements. They can freely switch between male and female voices, and their appearance can be human or cartoon-designed. This novelty captures audience curiosity, giving AI technology in broadcasting and hosting the advantage of novel expression forms.

1.3 Strong Learning Capabilities

AI possesses exceptional learning capabilities, essentially functioning as an intelligent learning model with multiple hidden layers. Through training and learning from massive datasets, it extracts representative feature information to achieve feature learning. This characteristic enables AI to perform emotional Q&A and knowledge resolution tasks in broadcasting and hosting. For example, when users question "Microsoft Xiaoice," the AI robot can quickly search its response corpus database to answer questions. This continuous process allows AI robots to train progressively from collected data, enabling accurate and rapid audience responses.

1.4 Human Resource Cost Savings

Traditional broadcasting and hosting consumes substantial human resources: scriptwriters create broadcast drafts, hosts deliver news orally, and non-live programs require post-production dubbing. This process is inefficient and drains

the energy of broadcasting professionals, representing significant labor cost consumption. AI technology can complete most broadcasting and hosting tasks, substantially saving labor costs—a considerable advantage in the media convergence era.

2. Application of AI Technology in Broadcasting and Hosting in the Media Convergence Era

Based on the above analysis of application advantages, broadcasting and hosting work must innovate and reform in the media convergence era by integrating new network technologies like AI. Virtual hosts with voice broadcasting, content generation, and human-computer interaction capabilities can be developed through AI to perform broadcasting and hosting tasks.

2.1 Application in Voice Broadcasting

AI application in voice broadcasting involves three processes: front-end reception, intermediate processing, and terminal output. First, acoustic front-end technology receives human voice or text signals to obtain training sample voice data. To acquire high-quality signals, directional pickup and noise reduction processing are applied to sound sources, enabling better voice signal discrimination. After reception, invalid, useless (non-source), and format-missing signals must be eliminated, as they affect broadcasting quality. AI recognition technology then accurately identifies human voices, excluding invalid signals. Current AI recognition technology can simultaneously identify Mandarin, English, and other foreign languages accurately. The recognition process involves decomposing voice signal data to extract key features, training on massive voice signals, deleting data inconsistent with features, and storing processed data in databases. Edited broadcast scripts are input to the front-end, which automatically searches stored voice data, combines individual characters using AI speech synthesis, and outputs voice through the terminal to complete broadcasting. This process applies multiple AI technologies including speech recognition, understanding, analysis, and synthesis, allowing voice customization (e.g., voices of Lin Chi-ling, Kang Hui) and adjustable speed and intonation. Practical cases include CCTV' s virtual host "Kang Xiaohui" modeled after Kang Hui, successfully applied in weather forecasts and traffic information broadcasting.

2.2 Application in Content Generation

AI can not only broadcast but also write broadcast content. AI content generation involves data collection, processing, analysis, theme extraction, and template matching. Based on content requirements, keyword searches are set at the front-end to collect relevant news drafts from the internet. Collected data formats are cleaned and unified, then analyzed using AI to extract relevant viewpoints, which are automatically matched with templates and output to generate new, compliant broadcast drafts. AI news writing is efficient and basically meets

requirements. Liaoning Fushun Radio and Television Station has introduced this technology, with some news drafts written by AI robots. Additionally, voice-to-text conversion in broadcasting is automated through endpoint detection, audio segmentation, and semantic analysis. However, AI-generated broadcast content has limitations and may contain semantic errors, requiring manual review and revision. High-demand, difficult broadcast drafts are better written manually, as AI writing capabilities remain limited.

2.3 Application in Knowledge Q&A

Knowledge Q&A is another important broadcasting and hosting function. Integrating AI with broadcasting enables AI-powered knowledge resolution. An intelligent dialogue module designed in AI robot client systems searches databases based on audience questions. These databases must contain not only voice data but also images, gestures, and facial expressions, as AI robots must extract keywords, body language, facial expressions, and gestures from questions to comprehensively retrieve final answers, which are delivered through speech synthesis. AI robots can answer questions, conduct dialogues, and communicate with audiences, possessing multiple social functions. The most successful AI robot in this area, "Dandan," has been widely applied in broadcasting Q&A, featuring human brain-like memory and storage functions. Additionally, AI can perform dubbing work in broadcasting and hosting, using speech synthesis technology similar to AI voice broadcasting to quickly find intrinsic connections between data and output voice after analysis.

Conclusion

In summary, AI technology facilitates broadcasting and hosting work by collecting data through cyberspace and performing series of processing and analysis. In the future, AI will be applied to all aspects of broadcasting and hosting, such as automatically identifying fake news, reviewing broadcast drafts, filtering false, vulgar, incorrect, and unreasonable content to improve draft quality and reduce workload, thereby substantially improving efficiency. This aligns with media convergence development requirements, perfectly integrating AI with broadcasting and hosting, promoting both AI technology development and broadcasting work method innovation. AI technology will inject new vitality into the entire broadcasting and hosting industry, advancing it from "convergence" to "intelligence."

This study investigated AI technology applications in broadcasting and hosting within the media convergence era, focusing on application advantages, processes, and specific applications. It promotes innovation and transformation of traditional broadcasting methods and facilitates AI technology promotion in broadcasting and hosting, greatly enhancing work innovation. However, current AI applications in broadcasting and hosting still have defects requiring further research. This paper only studied application advantages and processes, leaving

research gaps. Future work will explore application prospects of AI technology in broadcasting and hosting within the media convergence era.

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Note: Figure translations are in progress. See original paper for figures.