IRSTI 19.41.07 https://doi.org/10.26577/HJ79120266

Wang Ziming[1*], Ju Yang[1], Tao Qian[2]

[1]Peoples' Friendship University of Russia named after Patrice Lumumba (RUDN University), Moscow, Russia
[2]Beihai University of Art and Design, Beihai, China
*e-mail: 1042248002@rudn.ru

RECONSTRUCTING THE MEDIA SPACE OF DIGITAL NEWS FROM VISUALIZATION TO SPATIAL IMMERSION IN THE CASE OF "DONG NEWS"

The rapid development of motion news highlights the necessity of exploring spatial transformations in news communication, particularly the evolution from two-dimensional news visualization to three-dimensional spatial immersion. While existing research has examined narrative strategies and visual presentation in motion news, its role in reconstructing digital news media spaces remains understudied. Audience perceptions and interaction patterns with spatial motion news may influence immersion and communication effectiveness, yet these spatial perception mechanisms have received little in-depth exploration.

This study aims to investigate how motion news reconstructs digital news media spaces through spatial immersion and analyzes the impact of three-dimensional motion news on user immersion, information retention, and perceptions of news authenticity. Employing quantitative research methods with The Beijing News' three-dimensional motion news as the sample, combined with user experiments, this study comprehensively examines the logic of motion news in reconstructing news communication spaces. Findings indicate that the three-dimensional spatial construction of motion news significantly enhances audience immersion and information comprehension while altering users' judgment logic regarding news authenticity.

The study concludes that integrating spatial immersive narratives into motion news effectively enhances digital news dissemination outcomes and promotes a multidimensional understanding of news events. These findings provide practical pathways for advancing "Generative Spatial News," highlighting the immense potential of spatial journalism in elevating communication effectiveness and user cognitive experiences.

Keywords: digital news media space, spatial immersion, motion news, spatial journalism, news authenticity.

Ван Цзымин[1*], Ян Цзюй [1], Тао Цянь[2]

[1]Патрис Лумумба атындағы Ресей халықтар достығы университеті (РХДУ), Мәскеу, Ресей
[2]Бэйхай өнер және дизайн университеті, Бэйхай, Қытай
*e-mail: 1042248002@rudn.ru

Цифрлық жаңалықтардың медиакеңістігін қайта құру: визуализациядан кеңістіктік иммерсияға дейін «Dong News» мысалында

Қозғалыстағы жаңалықтардың қарқынды дамуы жаңалықтар коммуникациясындағы кеңістіктік трансформацияларды зерттеудің өзектілігін арттырады, әсіресе екі өлшемді визуализациядан үш өлшемді кеңістіктік иммерсияға өтуді. Қазіргі зерттеулерде қозғалыстағы жаңалықтардың баяндау стратегиялары мен визуалды ұсынылуы қарастырылғанымен, олардың цифрлық жаңалықтар медиакеңістігін қайта құрудағы рөлі жеткілікті деңгейде зерттелмеген. Кеңістіктік қозғалыстағы жаңалықтарды қабылдау және онымен өзара әрекеттесу үлгілері аудиторияның иммерсивтілік деңгейіне және коммуникация тиімділігіне әсер етуі мүмкін, алайда бұл механизмдер терең зерттелмеген.

Бұл зерттеудің мақсаты – қозғалыстағы жаңалықтардың кеңістіктік иммерсия арқылы цифрлық жаңалықтар медиакеңістігін қалай қайта құратынын анықтау және үш өлшемді қозғалыстағы жаңалықтардың пайдаланушылардың иммерсивтілігіне, ақпаратты есте сақтауына және жаңалықтардың шынайылығын қабылдауына әсерін талдау. Зерттеу «The Beijing News» үш өлшемді қозғалыстағы жаңалықтары негізінде сандық әдістер мен пайдаланушылар экспериментін қолдана отырып жүргізілді.

Нәтижелер үш өлшемді кеңістіктік құрылым аудиторияның иммерсивтілік деңгейін және ақпаратты түсінуін айтарлықтай арттыратынын, сонымен бірге жаңалықтардың шынайылығын

бағалау логикасын өзгертетінін көрсетті. Қорытындылай келе, кеңістіктік иммерсивті баяндауды қозғалыстағы жаңалықтарға енгізу цифрлық жаңалықтар коммуникациясының тиімділігін арттырады және жаңалық оқиғаларын көпқырлы түсінуді қамтамасыз етеді. Бұл зерттеу «генеративті кеңістіктік жаңалықтарды» дамытуға практикалық бағыттар ұсынады және кеңістіктік журналистиканың коммуникация тиімділігі мен пайдаланушылардың когнитивтік тәжірибесін жақсартудағы әлеуетін айқын көрсетеді.

Түйін сөздер: цифрлық жаңалықтар медиакеңістігі, кеңістіктік иммерсия, қозғалыстағы жаңалықтар, кеңістіктік журналистика, жаңалықтардың шынайылығы.

Ван Цзымин[1*], Ян Цзюй[1], Тао Цянь[2]

[1]Российский университет дружбы народов имени Патриса Лумумбы (РУДН), Москва, Россия
[2]Университет искусства и дизайна Бэйхай, Бэйхай, Китай
*e-mail: 1042248002@rudn.ru

Реконструкция медиапространства цифровых новостей: от визуализации к пространственной иммерсии на примере «Dong News»

Быстрое развитие «динамических новостей» подчеркивает необходимость изучения пространственных трансформаций в новостной коммуникации, особенно перехода от двухмерной визуализации новостей к трехмерной пространственной иммерсии. Хотя существующие исследования анализируют нарративные стратегии и визуальные формы представления в динамических новостях, их роль в реконструкции медиапространства цифровых новостей остается недостаточно изученной. Восприятие аудитории и модели взаимодействия с пространственными динамическими новостями могут существенно влиять на уровень иммерсивности и эффективность коммуникации, однако механизмы пространственного восприятия рассмотрены в научной литературе ограниченно.

Цель данного исследования заключается в выявлении того, как динамические новости реконструируют медиапространство цифровых новостей посредством пространственной иммерсии, а также в анализе влияния трехмерных динамических новостей на погружение пользователей, запоминание информации и восприятие новостной достоверности. На основе количественных методов и пользовательского эксперимента с использованием 3D-динамических новостей «The Beijing News» проведен комплексный анализ логики реконструкции новостного пространства.

Результаты показывают, что трехмерная пространственная конструкция динамических новостей существенно повышает уровень иммерсии и понимание информации, одновременно изменяя логику оценки пользователями новостной достоверности. Исследование делает вывод о том, что интеграция пространственных иммерсивных нарративов в динамические новости повышает эффективность цифровой новостной коммуникации и способствует многомерному осмыслению событий. Полученные выводы открывают практические пути развития «генеративных пространственных новостей» и демонстрируют высокий потенциал пространственной журналистики в повышении эффективности коммуникации и когнитивного опыта пользователей.

Ключевые слова: цифровое медиапространство новостей, пространственная иммерсия, динамические новости, пространственная журналистика, достоверность новостей.

Introduction

From 2D Visualization to 3D Immersion: The Technological Evolution of News

With the rapid advancement of digital media technology, animated news has gradually emerged as an innovative form of communication within the field of journalism. By leveraging techniques such as data visualization, motion graphics, interactive pathways, and spatial immersive storytelling, animated news transforms traditional linear narratives into interactive and immersive digital news experiences (Young et al., 2024). Since 2000, animated news has undergone three major developmental phases, progressively evolving from two-dimensional visualization to three-dimensional spatial immersion.

In the first phase (2000-2010), news primarily relied on Flash animation technology to visualize static news events. This was used in television news to realistically simulate scenarios that had occurred in the past but could not be filmed, or were too violent or graphic to be directly presented to television audiences. While Flash animation enhanced the visual appeal of news, its limited interactivity meant users were primarily passive recipients of information, resulting in constrained communication effectiveness.

The second phase (2010–2020) witnessed the deep integration of motion graphics (MG) with

data journalism. MG news significantly enhanced dynamic presentation through animated charts, visual hierarchies, and multimodal information integration, enabling users to intuitively grasp complex events. However, this phase remained confined to a two-dimensional information display, lacking deep user-content interaction.

Entering the third phase (2020–2024), with the maturation and application of 3D modeling, virtual reality (VR), augmented reality (AR), and AIGC (Generative Journalism Space) technologies, motion news has advanced into the era of "spatial immersive journalism." 3D motion news not only constructs immersive interactive spaces but also transforms users from passive recipients into active explorers through path selection and interaction mechanisms. This effectively enhances news dissemination effectiveness and deepens user engagement.

Beijing News "Animated News": An Innovative Model of 3D News in China

The Beijing News' "Animated News" is one of the earliest innovative news programs in China to deeply integrate animation technology with news dissemination. Since its official launch in 2014, it has quickly become a benchmark case for 3D animated news in China. With the core concept of "knowing the world without reading a single word," the program uses various technologies such as 3D modeling, data visualization, and motion graphics (MG) to reproduce traditional news content in a dynamic and spatial way, providing users with an unprecedented immersive news experience.

The technological advantages of The Beijing News' "Animated News" are mainly reflected in the following aspects.

3D modeling and rendering technology is a major highlight of this section. Utilizing professional modeling tools such as Maya, Blender, and Unity3D, the section creates 3D models and dynamically recreates key scenes from news events, enhancing the realism and spatial awareness of the presentation. Dynamic graphics and animated narratives, combined with animation tools like Flash and After Effects, use data-driven dynamic image processing to process complex news information, enabling users to gain a higher level of visual understanding. Through spatial paths and interactive mechanisms, users can freely explore different perspectives of news events within the immersive 3D animated news environment, achieving multi-path information acquisition and interaction, forming a cognitive chain of "exploration-understanding-reflection."

Case Study 1: The "Novel Coronavirus 'Outing' Protection" series uses animation to construct dialogues and interactions between characters, popularizing epidemic prevention measures and shifting the news narrative towards personalization. In reporting major and breaking news events, 3D technology can recreate moments that have occurred but were not captured, compensating for the awkwardness of the reporter's "absence" and allowing users to "see" the events unfold within the narrative.

Case 2: "Chinese Female Tourist Murdered in Bali, Lying on the Ground Covered in Blood with Multiple Stab Wounds". This case, through animation reconstructing the attack in the hotel that night, compensated for the lack of courtroom footage, improving the transparency and credibility of legal case reporting.

Case 3: "Moscow Terrorist Attack 3D Simulation" This simulation, using a floor plan of the concert hall, recreated the entire concert hall in a 1:1 scale and reorganized 30 videos taken by audience members according to timeline, retracing the breathtaking 14 minutes. Through the most complete 3D reconstruction, viewers could personally experience the terrorists' attack route and the audience's escape route, feeling as if they were witnesses to a mass shooting.

Core Conflict: Spatial Immersion Enhances Communication Effectiveness vs. Realism Triggers Authenticity Crisis

While 3D animated news significantly improves information retention, emotional resonance, and immersion, its "hyper-realism" also poses a potential challenge to news authenticity. Research has found that 3D animated news, through spatial modeling, visual storytelling, and user path selection, deeply immerses users in news events, greatly enhancing information comprehension and dissemination effectiveness. However, this "hyper-realism" may also lead to authenticity bias, resulting in cognitive dissonance.

The "3D Reconstruction of the Chongqing Bus Plunge" is a typical example. In 2018, the Beijing News' animated news platform reconstructed the entire Chongqing bus plunge incident using 3D modeling and user-interactive perspectives. While this work helped users explore accident details from multiple perspectives and enhanced emotional resonance, some viewers questioned the authenticity of the 3D scene reconstruction, arguing that the realistic reconstruction might weaken the objectiv-

ity of the news. A similar situation occurred in the "Sanxingdui Archaeological VR Reconstruction" project. This project uses VR scenes to immerse users in a virtual exploration of archaeological sites. However, some users mistakenly identify the VR scenes as real archaeological environments, leading to misjudgments of news authenticity and creating a "hyperrealism trap."

This contradiction highlights that while 3D animated news can enhance news dissemination, it can also cause users to have a blurred understanding of news authenticity, posing new challenges to news ethics and information transparency.

Research Question

Q1: Through which technological elements does 3D dynamic news reconstruct the media space of digital journalism?

Q2: How does spatial immersion quantitatively influence user cognition, including immersion levels, information retention rates, and authenticity judgments?

Q3: How does technical affordance regulate users' spatial news practices?

Significance of the study

The theoretical contribution of this study lies in introducing Henri Lefebvre's theory of the production of space (The Production of Space, 1991) into the analysis of spatial reconstruction in 3D motion graphics news. Lefebvre posits that the production of space is a dynamic process jointly constructed by material space, symbolic space, and social space. Within the dissemination environment of motion news, the modeling structure, visual pathways, and interactive mechanisms of 3D motion news shape the spatial framework of news events. Through visual symbols, dynamic anchors, and spatial narrative logic, news events undergo symbolic encoding to achieve visual storytelling of information. Users' path selection, interactive feedback, and information comprehension constitute their social interactions and meaning interpretation within spatial news. By dissecting the spatial immersion mechanisms of 3D motion news, this study enriches the theoretical perspectives of Spatial Journalism and provides foundational support for future AIGC-generated news spaces.

Practically, the research proposes the "Spatial Credibility Index" (SCI) as a crucial standard for future spatial news production, offering developmental guidance for Generative News Spaces. The SCI establishes standardized norms for future AIGC-generated news by quantitatively evaluating key dimensions, such as spatial modeling, interaction pathways, and information credibility. This ensures enhanced user immersion while preserving journalistic authenticity and technological transparency. The SCI mechanism will help balance technological innovation with ethical transparency in immersive news environments, delivering more authentic and credible news experiences to users.

Literature review

Animated News, an innovative format integrating animation technology with news dissemination, has undergone significant technological evolution and transformation in its dissemination model over the past decade (Duan, 2021). Early Animated News primarily employed Flash animations to simulate news events, recreating scenes that could not be filmed or presenting graphic violence in a visual format for audiences (Wibowo et al., 2024). In 2008, Hong Kong's Apple Daily pioneered the use of Flash animation in news reporting, delivering more visually impactful content to users. During this phase, animated news primarily featured static 2D animations, leaving users in a passive information-receiving state with limited dissemination effectiveness.

After 2010, motion news gradually integrated with MG technology, enabling dynamic charting and data visualization of news content, significantly enhancing the visual presentation of news information. MG news employs multi-layered infographics, dynamic paths, and visual animations, allowing users to grasp the core points of complex news events in less time (Veecock, 2021). For instance, the series "COVID-19 Outbreak Prevention Measures" employed motion graphics to visualize pandemic trends across different countries and regions, enabling audiences to intuitively comprehend complex data. However, animation news at this stage remained confined to two-dimensional displays, limiting users' ability to engage deeply with the content and thus maintaining its restricted information dissemination effectiveness.

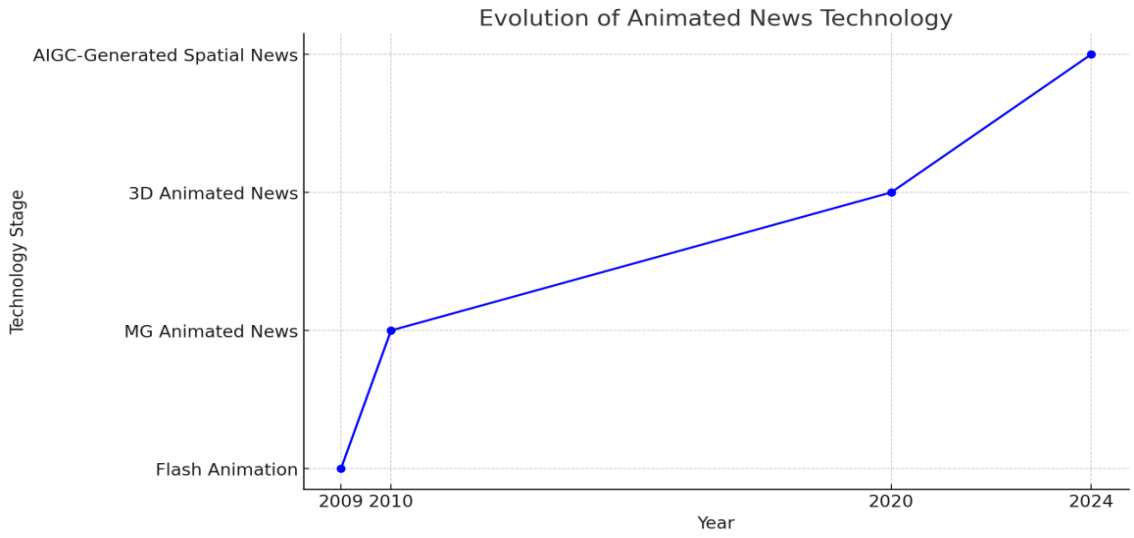
With the maturation and widespread adoption of technologies like 3D modeling, VR, AR, and AIGC (Generative Journalism Space), MG journalism has entered the 3D MG and Spatial Immersion phase. Since 2020, 3D motion graphics have gradually replaced traditional MG motion graphics, offering users more immersive and interactive news experiences through spatial modeling, path-based interac-

tions, and multi-perspective exploration. A notable example is the "3D Reconstruction of the Chongqing Bus Plunge Incident," which employs 3D modeling to multidimensionally recreate the accident scene, allowing users to freely select perspectives to explore the entire event. Through interactive paths and dynamic camera transitions, users gain multi-angle insights into the incident's unfolding logic, significantly enhancing information comprehension and emotional resonance (Liu et al., 2021).

The rise of 3D motion news not only transforms the form of news dissemination but also profoundly reconstructs the structure of media space (Jin & Liu, 2022). Henri Lefebvre's theory of the production of space provides a theoretical framework for understanding the spatial construction of 3D motion news. Lefebvre divides the production of space into three dimensions: Perceived Space, Conceived Space, and Lived Space. Within the 3D motion news environment, material space manifests in the technical construction of news spaces through 3D modeling, VR/AR scenarios, and interactive pathways; symbolic space is embodied in animated narratives, visual symbol coding, and the hierarchical presentation of spatial information; while social space emerges in the interactive process of user path exploration, information comprehension, and news meaning construction.

In recent years, Dr. Amy Schmitz Weiss (2024) introduced Spatial Journalism as an emerging theoretical paradigm, deepening research on 3D motion news spatial construction and user path interactions. Spatial Journalism emphasizes the dynamic relationship among news content, user interaction, and media space (Van der Nat et al., 2023). Users are no longer passive information recipients but become active participants in news events through multi-path exploration and spatial nesting. Research indicates that users can construct multidimensional information cognition chains along the "exploration-understanding-reflection" spatial path, forming more comprehensive spatial cognition of news events. Figure 1 illustrates the technological evolution of motion graphics journalism since 2009, tracing its progression from Flash animations to MG motion graphics, then to 3D motion graphics, and finally to the development of AIGC-generated news spaces.

Figure 1
Evolution of Animated News Technology



Note: Compiled by the author

Although 3D animated news significantly enhances user immersion and information comprehension, authenticity challenges have gradually drawn academic attention (Rehman, 2024). Authenticity bias and the hyper-reality trap have emerged as major ethical challenges for 3D animated news. Within immersive news environments, users often place excessive trust in the hyper-realistic scenes of 3D animated news, mistakenly interpreting virtual reenactments as factual reporting and devel-

oping cognitive biases regarding news authenticity (Charma et al., 2025). For instance, in the "Sanxingdui Archaeology VR Reconstruction" project, some users misinterpreted VR scenes as actual archaeological sites, leading to misperceptions about news veracity. With the rapid advancement of AIGC technology, Generative Spatial News is progressively transforming news content production mechanisms. AIGC enables scalable production of 3D dynamic news through automated modeling, path generation, and content creation, while simultaneously raising authenticity challenges and ethical dilemmas for spatial news. To address these challenges, the Spatial Credibility Index (SCI) has been proposed as a novel evaluation mechanism. It aims to ensure that AIGC-generated news spaces maintain journalistic authenticity and transparency while enhancing user immersion through multidimensional quantification of spatial modeling, user path interactions, engagement mechanisms, and authenticity assessments.

Although existing research has explored 3D dynamic news, user immersion mechanisms, and AIGC-generated news spaces in depth, the following research gaps remain: How does 3D dynamic news reconstruct digital media spaces? Existing research has not sufficiently explored the spatial construction, user path interactions, and information dissemination mechanisms of 3D dynamic news. How do the interactive mechanisms between user immersion and authenticity judgments operate? Current studies have not deeply analyzed how immersive news environments trigger user authenticity biases and the phenomenon of the "hyper-reality trap." How can AIGC-generated news spaces balance authenticity and immersion? This topic lacks a systematic evaluation framework and standardized norms.

This study will address these gaps by examining media space theory, user path interaction mechanisms, and ethical norms for AIGC-generated news spaces. It aims to provide theoretical foundations and practical guidance for the future development of spatial journalism.

Research methodology

Research Design

This study employs a between-subjects experimental design, collecting data through a pre-test–viewing–post-test pathway to examine the effects of 3D animated news compared to traditional 2D animated news on user immersion, information retention, and judgments of news authenticity.

H1: 3D motion news significantly enhances user immersion.

H2: 3D motion news significantly improves user information retention.

H3: 3D motion news significantly influences news authenticity judgments more than 2D motion news.

Experimental Variables:

Independent Variable: Motion News Type (3D Motion News vs. 2D Traditional Motion News)

Dependent Variables: User Immersion Level, Information Retention Rate, News Authenticity Judgment

Data Collection and Analysis

Data Sources and Sample Characteristics

The data for this study were collected through an offline user survey conducted by the researcher in February 2025 at the School of Arts of a university in China.

Participants were drawn from two undergraduate classes within the school, with a total of 120 undergraduate students majoring in Digital Media participating in the survey. The age range of the survey sample was 18–25 years; the gender ratio was 47% male and 53% female.

All participants had watched and were familiar with The Beijing News·Animated News and other forms of two-dimensional animated news.

Participants in this study were undergraduate students majoring in digital media, who may exhibit higher technical proficiency and familiarity with immersive communication formats compared to the general population. Their prior exposure to animated news and digital visualization tools may have influenced their responses to the 3D spatial environment. This sample is suitable for testing immersive mechanisms in a controlled setting; caution should be exercised when generalizing findings to broader audiences with varying levels of media literacy.

Data Collection Path and Experimental Process

Data collection employed an offline questionnaire method, completed during two class periods.

① Pre-Test:

Assessed participants' foundational news comprehension and spatial cognition to ensure comparable baseline levels across classes before the experiment. The pre-test questionnaire covered news viewing habits, information comprehension abilities, and preliminary judgments on news authenticity. Pre-test data revealed no significant differences

between the experimental and control groups in news comprehension ability or authenticity judgment tendencies ($p > 0.05$), establishing a foundation for the intervention experiment.

② News Viewing & Interaction Experiment:

Experimental Group (EG1): Users viewing 3D animated news (N = 60);

Control Group (CG): Users viewing 2D traditional animated news (N = 60).

Participants viewed either 3D or 2D animated news, with viewing duration, interaction paths, and user feedback recorded.

③ Post-Test:

Post-test questionnaires measured users' immersion, information retention, and news authenticity judgment;

Users provided news feedback after completing the experiment, recording subjective perceptions of news viewing experiences and preferences for interaction path selection.

Data Analysis Methods

This study employed SPSS for data analysis:

Descriptive Statistics: Calculated the mean (M) and standard deviation (SD) for user immersion, information retention, and news authenticity judgment;

Independent Samples t-Test: Compared significant differences ($p < 0.05$) between experimental and control groups across variables;

Analysis of Variance (ANOVA): Detected main effects of multidimensional variables across different experimental groups.

Research Ethics Statement

All participants signed informed consent forms, explicitly agreeing that their data would be used solely for academic research, ensuring participant privacy and data security.

Findings

Descriptive Statistics

This study first conducted descriptive statistical analysis on data from the 3D motion news (EG1) and 2D traditional motion news (CG) groups, including the mean (M) and standard deviation (SD) for three variables: immersion, information retention rate, and news authenticity judgment.

Table 1

Descriptive Statistics of User Immersion, Information Retention, and News Authenticity Judgment (Source: compiled by the author)

Variable	Group	Mean (M)	Standard deviation (SD)
Immersion Level	CG	4.24	0.89
	EG1	5.67	0.71
Retention	CG	69.87	7.31
	EG1	84.98	4.72
Judgment	CG	4.53	0.61
	EG1	6.03	0.63

The 3D animated news (EG1) demonstrated significantly higher mean scores than the 2D traditional animated news (CG) in immersion, information retention rate, and news authenticity judgment. The EG1 group's mean immersion score was 5.67, higher than the CG group's 4.24. The EG1 group's mean information retention rate was 84.98%, higher than the CG group's 69.87%; The EG1 group's mean news authenticity judgment score was 6.03, significantly higher than the CG group's 4.53.

Independent Samples t-Test Results

To verify whether the differences between groups were significant, an independent samples t-test was conducted. The results showed that the differences between the 3D animated news (EG1) and 2D traditional animated news (CG) groups in terms of immersion, information retention rate, and judgment of news authenticity were all significant ($p < 0.001$).

Table 2 –
Independent Samples t-Test Results for Immersion, Information Retention, and News Authenticity Judgment (Source: compiled by the author)

Variable	t-value	p-value	Interpretation of Results
Immersion Level	t = 12.19	p < 0.001	Significant differences between groups
Retention	t = 14.32	p < 0.001	Significant differences between groups
Judgment	t = 13.45	p < 0.001	Significant differences between groups

Hypothesis Testing

H1: 3D animated news significantly enhances user immersion → Validated ($p < 0.001$)

H2: 3D animated news improves user information retention → Validated ($p < 0.001$)

H3: 3D animated news significantly influences news authenticity judgment more than 2D animated news → Validated ($p < 0.001$)

Analysis of Variance (ANOVA Results)

To further validate multidimensional variable differences across groups, this study conducted an analysis of variance (ANOVA). Results indicate all F-values are significant ($p < 0.001$), confirming substantial differences between 3D animated news and 2D traditional animated news in immersion, information retention, and news authenticity judgment.

Table 3 – Results of ANOVA Analysis of Variance *(Source: compiled by the author)*

Variable	F-value	p-value	Interpretation of Results
Immersion Level	F = 93.64	p < 0.001	Significant differences between groups
Retention	F = 180.92	p < 0.001	Significant differences between groups
Judgment	F = 176.03	p < 0.001	Significant differences between groups

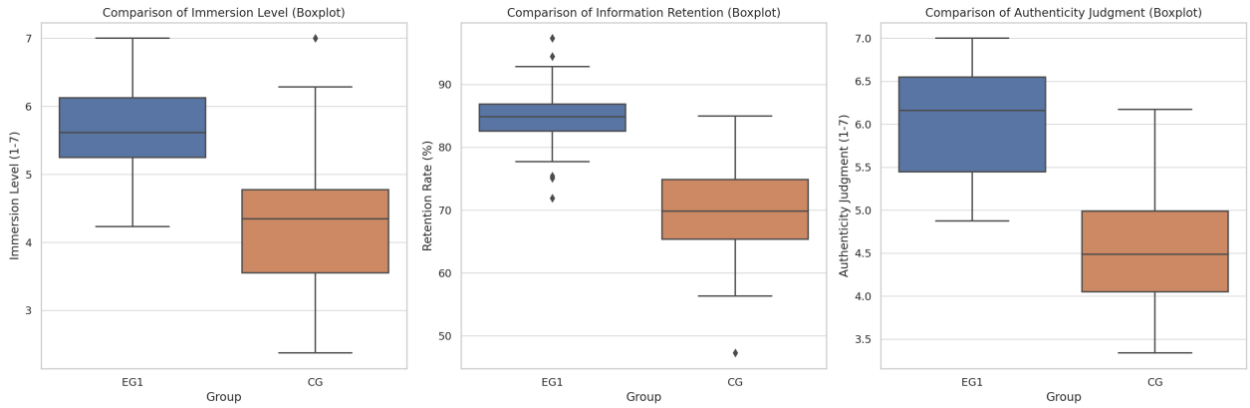
The results indicate that different types of animated news significantly differ in their effects on immersion, information retention, and judgments of news authenticity. The F-value and p-value results support all three hypotheses of this study.

Visualized Results

Figure 2
Bar chart comparing means between groups

Note: Compiled by the author.

Figure 3
Boxplot for intergroup comparison



Note: Compiled by the author.

Discussion

Theoretical Implications

This study validates the mechanism by which 3D animated news significantly influences users' news comprehension through spatial immersion, information retention, and judgments of news authenticity. This finding expands the theoretical boundaries of spatial journalism. Spatial journalism emphasizes that news communication is not merely a linear presentation of content but a spatial construction process. Users build multidimensional cognition of news events through multi-path exploration, interactive choices, and spatial immersion. The experimental results enrich the theoretical perspective of spatial journalism, demonstrating that 3D animated news not only enhances users' situational immersion through visual anchors, interactive pathways, and dynamic narratives but also forms a multidimensional information cognition chain within the "exploration-understanding-reflection" pathway, effectively improving information comprehension and news trust. By reconstructing material, symbolic, and social spaces, animated news enables users to reconstitute news meaning through spatial exploration of events.

This study reveals the cognitive bias effect of 3D animated news immersion on news comprehension. According to Media Immersion Theory, users in deeply immersive environments exhibit heightened emotional resonance and information processing, thereby improving news understanding and retention. Results indicate that the 3D motion news group exhibited significantly higher average immersion scores ($M = 5.67$, $p < 0.001$) than the 2D traditional motion news group ($M = 4.24$). Importantly, excessive immersion may trigger the Hyper-Reality Trap, where users in immersive news environments mistake virtual representations for real events, leading to cognitive biases about news authenticity. This phenomenon highlights the double-edged effect of 3D motion news: while enhancing news immersion, it may also compromise judgments about information veracity.

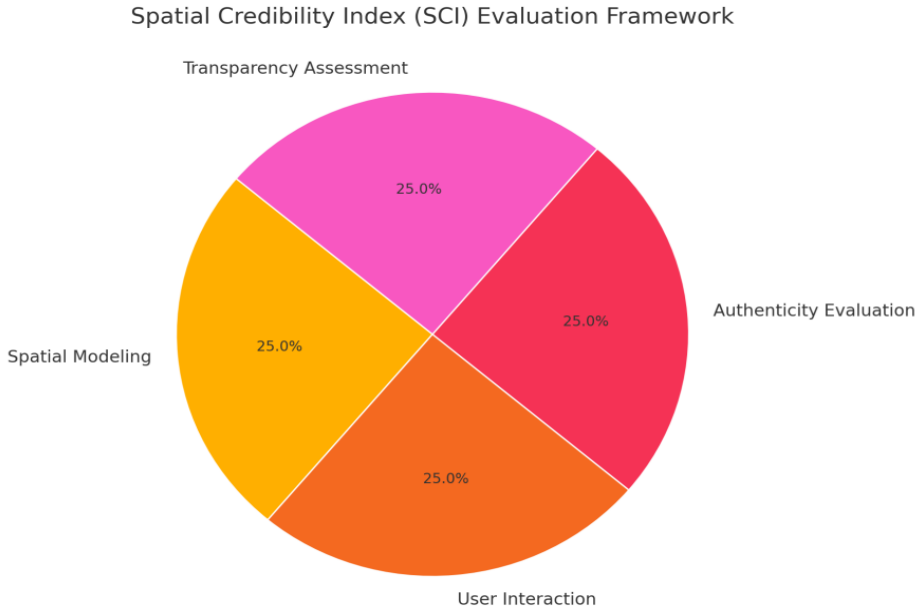
This study further confirms the significant enhancement of information retention rates by 3D animated news. Experimental results show that the mean information retention rate for the 3D animated news group was 84.98%, substantially higher than the 69.87% for the 2D traditional animated news group, representing a 21.64% increase in retention. This finding aligns with the core tenets of Cognitive Load Theory (Sweller, 1998). By integrating multimodal information (MG charts + 3D models + dynamic interactions), 3D animated news effectively reduces users' external cognitive load, enabling them to focus on processing core news content. The spatial interaction path generation in 3D motion news assists users in constructing cognitive maps, guiding them to optimize information encoding and storage processes through exploration, comprehension, and reflection pathways, thereby further enhancing the accuracy of information retention.

Practical Implications of Research Findings

This study reveals the immense potential of AIGC in motion news production and spatial immersion optimization. With the rapid advancement

of AIGC technology, future news production will enter the era of "Generative Spatial News." The integration of AIGC will drive a profound paradigm shift in news production. AIGC enables automated 3D news modeling, dynamically generating three-dimensional scenes of news events through Natural Language Processing (NLP) and Computer Vision (CV) technologies, significantly enhancing news timeliness and user immersion. Based on user behavior data and preferences, AIGC can generate personalized news interaction paths through machine learning algorithms, enabling users to receive more customized news experiences within immersive news spaces. In the future, a Spatial Credibility Index (SCI) could be established to quantitatively evaluate AIGC-generated content through spatial modeling, interaction path analysis, and authenticity assessments, thereby ensuring the veracity and technical transparency of AIGC news content.

Figure 4
Spatial Cresibility Index (SCI) Evaluation Framework



Note: Compiled by the author

To uphold the authenticity and ethical standards of news, this study proposes a "Spatial News Ethics Four-Quadrant Model" as an important guideline for future animated news production. This model includes two dimensions: Realism Accuracy and Emotional Protection Strength, providing ethical guidelines for news production and dissemination. This study recommends establishing a key anchor point transparency mechanism for animated news production, marking key anchor points in 3D modeling, interactive paths, and dynamic narratives to prevent users from falling into a "hyperrealism trap" in highly immersive environments. AIGC-generated content should be included in a source tracing mechanism to ensure users can trace the content generation path and technological origins of 3D animated news, and to identify and evaluate content authenticity using the Spatial Credibility Index (SCI). The establishment of these mechanisms will effectively enhance users' trust in AIGC news content, ensuring that animated news production maintains the boundaries of news authenticity while preserving immersive effects.

Limitations and Future Research Directions

Despite the contributions of this study, several limitations should be noted. The sample comprised 120 undergraduate students majoring in digital media in China. This group may be relatively familiar with digital visualization and immersive technologies. Their educational background may have influenced their sensitivity to 3D formats and interactive

news environments. Consequently, the observed levels of immersion and realism perception may not fully represent the reactions of a broader audience, particularly those with lower media literacy or technical experience. Future research should include participants of varying ages, disciplinary backgrounds, and digital literacy levels to test whether the findings apply to more diverse populations. The experiment was conducted in a controlled classroom setting. While this design ensured consistent exposure and enhanced internal validity, it did not fully replicate real-life news consumption scenarios. In daily life, users typically encounter news through mobile devices, social media feeds, and distracting environments. These factors may influence how users process and evaluate immersive formats. Further research conducted in natural media environments would help determine whether similar cognitive and authenticity patterns emerge outside laboratory settings. This study is grounded in a singular media and cultural context, China's digital news environment. While The Beijing News provides a valuable case for spatial journalism development, immersive news practices and audience expectations vary across cultural systems. Comparative research involving different national contexts would enable scholars to explore how cultural norms, media regulation, and journalistic traditions shape perceptions of immersion and credibility within 3D news environments.

Future research could broaden the analytical scope by incorporating additional variables such as emotional engagement, long-term trust-building, and behavioral interaction patterns. Longitudinal study designs may help clarify whether immersion-driven authenticity effects remain stable over time or diminish with repeated exposure. These research directions will contribute to a more comprehensive understanding of spatial journalism within the evolving digital ecosystem.

Conclusion

This study, focusing on the spatial immersion mechanism of 3D animated news, delves into its multidimensional impact on user news cognition. The study found that 3D animated news significantly enhances users' understanding and cognition of news content by improving immersion, information retention rate, and judgment of news authenticity. Experimental results show that the mean immersion of 3D animated newsgroups ($M = 5.67$, $p < 0.001$) is significantly higher than that of traditional 2D animated newsgroups ($M = 4.24$), validating the Media Immersion Theory, which states that a highly immersive environment helps enhance users' sense of engagement with the news. Furthermore, the mean information retention rate of 3D animated newsgroups (84.98%) is significantly higher than that of traditional 2D animated newsgroups (69.87%), further validating the Cognitive Load Theory (Sweller, 1998), which states that multimodal information integration helps reduce users' external cognitive load and improve news information retention.

This reveals the dual impact of 3D animated news on news authenticity judgment. On the one hand, the spatial immersion of 3D animated news increases users' trust in news content; on the other hand, overly realistic news scenes may trigger a hyper-reality trap, leading to biases in users' judgment of news authenticity. From the perspective of spatial journalism, this study further demonstrates that 3D animated news not only reconstructs the material and symbolic spaces of news dissemination but also alters users' social spatial cognition of news events through user path exploration and interaction mechanisms. This finding expands the theoretical scope of spatial journalism, providing a new theoretical perspective for understanding the dissemination mechanism of 3D animated news in the digital news space.

Despite its limitations, this study provides a structured empirical foundation for understanding the cognitive and ethical dynamics of space news. While the findings should be interpreted within specific contexts, they offer theoretical guidance and establish a baseline for conducting large-scale and cross-cultural research.

Theoretical Contributions

This study enriches the theoretical system of spatial journalism by verifying how 3D animated news influences users' news understanding through immersion, interactive paths, and spatial exploration mechanisms, providing new empirical support for spatial journalism. This study deepens the application scenarios of media immersion theory and cognitive load theory in the 3D animated news environment, revealing the interaction mechanism between immersion and information retention rate. Finally, the study proposes the concept of the "Spatial Credibility Index (SCI)," providing a theoretical basis for evaluating the content credibility of AIGC-generated news spaces and offering guidance for the future application of AIGC technology in news production.

Practical Value

The practical value of this research is reflected in three aspects: the production standards for animated news, the mechanism for protecting the authenticity of news, and the technical standards for AIGC-generated news spaces. First, the research proposes a "Four-Quadrant Model of Spatial News Ethics," providing an ethical evaluation framework for the production of future 3D animated news, ensuring that news content enhances immersion while avoiding misleading information. Second, the research emphasizes the importance of establishing a "Spatial News Credibility Index (SCI)" mechanism. This mechanism quantitatively evaluates the credibility of AIGC-generated news through dimensions such as spatial modeling, interactive paths, and authenticity judgment, providing technical assurance for news authenticity. Finally, the research provides technical standard recommendations for the future development of AIGC-generated news spaces, including automated 3D news modeling, personalized interactive path generation, and news content traceability mechanisms. These standards will help improve the transparency and trustworthiness of AIGC technology in the field of news production.

Author Contributions

Wang Ziming – Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing.

Ju Yang: Investigation, Visualization.

Tao Qian – Validation, Investigation (Data collection), Writing – review & editing.

References

Duan, R., Crosswell, L., & Barber, K. (2021). Animation in Environmental Journalism: Effects on News Perception and Information Seeking. *Journal of Broadcasting & Electronic Media*, *65*(2), 205–227. https://doi.org/10.1080/08838151.2021.1923716

Jin, P., & Liu, Y. (2022). Fluid space: Digitisation of cultural heritage and its media dissemination. *Telematics and Informatics Reports*, *8*. https://doi.org/10.1016/j.teler.2022.100022

Liu, N.X., Veecock, C., & Zhang, S.I. (Eds.). (2021). Chinese News Discourse: From Perspectives of Communication, Linguistics and Pedagogy (1st ed.). Routledge. https://doi.org/10.4324/9781003032984

Liu X, Yan J, Yang H, Jia X. Road intersections vehicle tracking based on multi-layer graphs and multi-angle. *Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering*. 2021;236(10-11):2386-2398. https://doi.org/10.1177/09544070211055536

Rehman, A., Abbas, Q., & Pahore, M.R. (2024). Reality Reimagined: Tracing the Evolution and Anticipating the Future of Virtual and Augmented Reality in Media. *Media and Communication Review*. https://doi.org/10.32350/mcr.41.08

Schmitz Weiss, A., & Oppegaard, B. (2024). Location Data: A Delphi Study of its Ethical Implications for the News Industry. *Journalism Practice*, *18*(7), 1790–1810. https://doi.org/10.1080/17512786.2022.2103725

Sharma, V.K., Garg, R., & Caudron, Q. A systematic literature review on deepfake detection techniques. *Multimed Tools Appl* 84, 22187–22229 (2025). https://doi.org/10.1007/s11042-024-19906-1

Van der Nat, R., Müller, E., & Bakker, P. (2023). Navigating Interactive Story Spaces. The Architecture of Interactive Narratives in Online Journalism. *Digital Journalism*, *11*(6), 1104–1129. https://doi.org/10.1080/21670811.2021.1960178

Wibowo, M. C., Nugrhono, S., & Wibowo, A. (2024). *Visual aesthetics of narrative animation of 3D computer graphics: From both realist and expressive points of view*. https://doi.org/10.69598/hasss.24.1.260646

Young, G.W., Dinan, G., Smolic, A. *et al.* Exploring the impact of volumetric graphics on the engagement of broadcast media professionals. *Multimedia Systems* 30, 310 (2024). https://doi.org/10.1007/s00530-024-01517-3

Information about authors:

Wang Ziming (Corresponding Author) – PhD Student, Peoples' Friendship University of Russia (RUDN University), (Moscow, Russia, e-mail: 1042248002@rudn.ru).

Ju Yang – PhD Student, Peoples' Friendship University of Russia (RUDN University), (Moscow, Russia, e-mail: 1042248017@rudn.ru).

Tao Qian – Senior Lecturer, Beihai University of Art and Design, Beihai, China, e-mail: taoqiansqmd@163.com).

Авторлар туралы мәлімет:

Ван Цзымин (корреспонденттік автор) – Патрис Лумумба атындағы Ресей халықтар достығы университеті (РХДУ), PhD докторанты (Мәскеу, Ресей, e-mail: 1042248002@rudn.ru).

Цзюй Ян – аспирант, Патрис Лумумба атындағы Ресей халықтар достығы университеті (РХДУ), PhD докторанты (Мәскеу, Ресей, e-mail: 1042248017@rudn.ru).

Тао Цянь – Бэйхай өнер және дизайн университеті, аға оқытушы (Бэйхай, Қытай, e-mail: taoqiansqmd@163.com).

Сведения об авторах:

Ван Цзымин (автор для корреспонденции) – аспирант, Российский университет дружбы народов имени Патриса Лумумбы (РУДН) (Москва, Россия, e-mail: 1042248002@rudn.ru);

Цзюй Ян – аспирант, Российский университет дружбы народов имени Патриса Лумумбы (РУДН) (Москва, Россия, e-mail: 1042248017@rudn.ru);

Тао Цянь – старший преподаватель, Университет искусства и дизайна Бэйхай (Бэйхай, Китай, e-mail: taoqian-sqmd@163.com).

Received: December 7, 2025
Accepted: February 24, 2026